ATLAS VINOGRADARSTVA I VINARSTVA BOSNE I HERCEGOVINE

ATLAS OF VITICULTURE AND WINE OF BOSNIA AND HERZEGOVINA

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Book cover
Na prednjoj stranici stilizirani oblik ukrasa na portalu rimske rustikalne vile u Mogorjelu, na stražnjoj stranici rimski bog Liber, nađen u Vašarovinama kod Livna.
On the front cover: a stylized decoration on the portal of the Roman rustic villa in Mogorjelo; on the back cover: the Roman god Liber, found in Vasarovine near Livno.

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PREDGOVOR

Do sada je napisan veliki broj publikacija o vinogradarstvu i vinarstvu u Bosni i Hercegovini, međutim ovo je prva publikacija koja obuhvaća širok raspon tema iz toga područja. Knjiga koja je pred vama, *Atlas vinogradarstva i vinarstva Bosne i Hercegovine*, rezultat je rada na projektu prikupljanja i održavanja autohtonih sorata vinove loze koji je Agronomski i prehrambeno-tehnološki fakultet u Mostaru započeo prije osam godina. Cilj je toga projekta bio prikupiti sve postojeće autohtone sorte vinove loze, posaditi ih zajedno u jedan kolekcijski nasad i tu ih održavati. Suradnici na projektu Jure Beljo, Marijo Leko i Ana Mandić (Sabljo) obišli su cijelo vinogradarsko područje Hercegovine i uz svesrdnu pomoć nekih agronoma, vinogradara i udruga, uspjeli su prikupiti više od 30 sorata. U održavanju sorata veliku pomoć imali smo od firme *Plantaže* Čapljina koja nam je ustupila zemljište za prvi kolekcijski nasad. U 2014. godini sve su sorte cijepljene na istu podlogu i posađene na poligonu Agronomskoga i prehrambeno-tehnološkoga fakulteta u Rodoču gdje će biti održavane.

Bez ovoga projekta mnoge bi stare sorte u dogledno vrijeme nestale kao što su već iz svoga prirodnog staništa nestale brojne sorte ratarskih kultura. Mnoge sorte pronašli smo kao pojedinačna stabla u starim vinogradima i odrinama i tako ih sačuvali za budućnost. Autohtone, odnosno lokalne sorte, prirodno su bogatstvo i baština svakoga područja i treba ih na svaki način očuvati. Mi smo to kroz ovaj projekt uspjeli s vinovom lozom, najvažnijom kultiviranom vrstom Hercegovine. Kolekcijski nasad u Rodoču bit će banka gena hercegovačkih sorata vinove loze.

Projekt je izveden uz potporu Federalnoga ministarstva znanosti i obrazovanja, Federalnoga ministarstva poljoprivrede, a najveću financijsku

FOREWORD

Many publications on viticulture and winemaking in Bosnia and Herzegovina have been written so far, but this is the first publication that covers such a wide range of topics in this field. The book in front of you, Atlas of Viticulture and Wine of Bosnia and Herzegovina, is the result of efforts on the project of collection and preservation of autochthonous grape varieties, which was launched eight years ago by the Faculty of Agriculture and Food Technology, University of Mostar. The objective of the project was to collect all the existing autochthonous varieties of vines, plant them together into one collection plantation and maintain them there. The project members Jure Beljo, Marijo Leko, and Ana Mandic (Sabljo) inspected the entire wine-growing area of Herzegovina and managed to collect more than 30 varieties with the wholehearted support of some agronomists, wine-growers and associations. In maintaining the varieties, we had a big support from the company "Plantaze" Capljina, which gave us land for the first collection plantation. In 2014, all varieties were grafted onto the same rootstock and planted in the test field of the Faculty of Agriculture and Food Technology in Rodoc, where they will be maintained.

Without this project, many of the old varieties would disappear in the foreseeable future, like many varieties of agricultural crops that have already disappeared from their natural habitat. We found many varieties as single trees in old vineyards and trellis works, and thus preserved them for the future. Autochthonous or local varieties are the natural wealth and heritage of every area and should be preserved in every possible way. Through this project, we did it with grapevine, the most important cultivated species of Herzegovina. The collection plantation in Rodoc will be a gene bank of Herzegovinian grape varieties.

i stručnu potporu dobili smo od Norveške vlade. U okviru programa pomoći zemljama Jugoistočne Europe Norveška vlada je posredstvom Sveučilišta za biološke znanosti, Odjela međunarodnih studija razvoja i okoliša, (NMBU), Noragric, pomogla izvođenje dva naša projekta: *Biljni genetski izvori*, kao dio projekta *Zaštita bilja i biljni genetski izvori u Jugoistočnoj Europi* (2006. – 2009.), te projekt *Očuvanje bioraznolikosti i genetska identifikacija vinove loze i nekih voćnih vrsta u Bosni i Hercegovini*, kao dio većeg projekta *Osiguranje genetske raznolikosti i biljne zaštite za hortikulturu Bosne i Hercegovine* (HERD 2010. – 2014.). Posebno dobru suradnju na tim projektima imali smo s kolegama koji su bili koordinatori projekata: Aasmund Asdal (Norveški centar za genetičke resurse), Dag-Ragnar Blystad (Bioforsk), te Thor Larsen i Mensur Vegara sa Sveučilišta za biološke znanosti u Ås-u. Bez njihove podrške i financijske potpore Norveške vlade taj projekt ne bi bio ostvaren, na čemu im i ovaj put zahvaljujemo.

Iako se u monografiji puno prostora posvećuje vinarstvu, te vinima Žilavki i Blatini, mnogi će se zapitati kako to da u cijeloj knjizi ima samo jedna posebna slika boca s tim vinima. Ova monografija nije komercijalna knjiga, nego stručno-informativna publikacija i bilo bi neprimjereno reklamiranje bilo čijih proizvoda, pogotovo ako bi se to radilo selektivno. Jer na svakoj boci vina nalazi se logo proizvođača, a kako u Bosni i Hercegovini ima šezdesetak vinara ne bi bilo korektno čije proizvode staviti, a druge izostaviti. Stoga smo odlučili da monografija bude bez i jedne označene butelje vina.

Moramo nešto reći o pisanju imena sorata u ovom Atlasu. Do sada je uobičajena praksa u stručnoj literaturi bila da se imena sorata kultiviranog bilja, a napose u vinovoj lozi, pišu velikim početnim slovom iako to nije u skladu s pravopisnim normama hrvatskoga standardnog jezika. Naime svi pravopisni priručnici propisuju da se imena sorata kultiviranoga bilja pišu malim početnim slovom. U vinovoj lozi ima mnogo sorata koje su ime dobile po osobi ili mjestu, a to je posebno istaknuto u podlogama vinove loze koje uglavnom nose ime prema svom autoru (Kober, Paulsen, Richter, Ruggeri). U svim dosadašnjim knjigama o vinogradarstvu imena sorata pišu se velikim

The project was conducted with the support of the Federal Ministry of Education and Science, Federal Ministry of Agriculture, and we received the biggest financial and technical support from the Norwegian government. Within the program of support to Southeast European countries, through the Norwegian University of Life Sciences (NMBU), Department of International Environment and Development Studies (Noragric), the Norwegian government supported implementation of two of our projects: *Plant Genetic Resources*, as part of the project *Plant Health and Genetic Resources in South East Europe* (2006 – 2009), and the work package *Biodiversity preservation and genetic identification of grapevine and some fruit crops in Bosnia and Herzegovina*, as part of the project Providing genetic diversity and healthy plants for the horticulture in Bosnia and Herzegovina (HERD 2010 – 2014). On these projects, we had a particularly good cooperation with colleagues who were project coordinators: Aasmund Asdal (The Norwegian Genetic Resource Centre), Dag-Ragnar Blystad (Bioforsk), and Thor Larsen and Mensur Vegara from the University of Life Sciences, Ås.This project could not have been realized without their assistance and financial support of the Norwegian government, for which this time too we extend our appreciation to them.

Although the monograph devotes much space to winemaking, as well as Zilavka and Blatina wines, many will wonder how come there is only one particular picture of the bottles of these wines in the book. This monograph is not a commercial book, but a professional and informative publication and it would be inappropriate to advertise someone's products, especially if it would be done selectively. Since there is a manufacturer's logo on every bottle of wine, and being that there are about sixty winemakers in Bosnia and Herzegovina, it would not be fair to include products of ones and leave out products of others. Therefore, we decided that the monograph would be without a single labeled bottle of wine.

The atlas is the result of efforts of a large number of collaborators. There is a total of 12 authors of texts, and all of them deserve acknowledgment for the efforts they made, most of all Ana Mandic and Marijo Leko, who are also coeditors in some

početnim slovom i stoga smo odlučili da i u ovoj knjizi imena sorata pišemo velikim početnim slovom, iako je to, ponovimo još jednom, suprotno postojećim pravopisnim normama.

Atlas je rezultat rada velikog broja suradnika. Ukupno je 12 autora tekstova i svi zaslužuju priznanje za uloženi trud, a ponajviše Ana Mandić i Marijo Leko koji su na stanovit način bili i suurednici. Zahvalnost dugujemo recenzentima knjige, prof. dr. Dragutinu Mijatoviću, prof. dr. Ivanu Pejiću i mr. Hivzi Pediši. Njihove primjedbe i sugestije su u velikoj mjeri doprinijele poboljšanju sadržaja monografije. Veliki doprinos u radu na knjizi dali su Goran Ćavar uređivanjem fotografija i slaganjem slika sorata i Ivica Beljo koji je radio tehničko uređivanje knjige. Moramo također spomenuti veliki trud lektorice, profesorice Irine Budimir, te prevoditelja Gorana Šame. Svi navedeni zaslužni su za nastanak ovog djela i svima zahvaljujemo.

way. Thanks are due to the reviewers of the book, Dragutin Mijatovic, Ph.D., Ivan Pejic, Ph.D., and Hivzo Pedisa, M.Sc. Their comments and suggestions have greatly contributed to improving the content of the monograph.

Considerable contributions to the book were provided by Goran Cavar, who edited photos and arranged images of the varieties, and Ivica Beljo who was the copy editor. We should also mention the great efforts of the language editor, Professor Irina Budimir, and translator Goran Samo. They all deserve credits for production of this work and we extend our gratitude to them all.

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UVOD

Noa zemljoradnik, zasadi vinograd
Knjiga postanka (9.20)

Vinova loza i vino sastavni su dio ljudske civilizacije od prapovijesti do današnjih dana. Vinova loza je najvažnija voćna kultura u svijetu. Uzgaja se u raznolikim klimatskim uvjetima, ali je ponajprije kulture umjerene klimatske zone. Po Bibliji, Noa je nakon završetka općeg potopa od svih kultiviranih vrsta najprije zasadio vinovu lozu. Vinova loza i vino spominju se u Bibliji na mnogo mjesta i u različitim konotacijama. Iako je uživanje alkohola po islamu zabranjeno, u Kur'anu se spominje vinova loza, a neke izrazito islamske zemlje veliki su proizvođači grožđa.

Od antičkih vremena vinova loza je božanska biljka, a vino božansko piće. Vinova loza je jedna od rijetkih kultiviranih vrsta koja ima svoje božanstvo. U Grčkoj je to Dioniz, a u Rimu Liber. Dioniz je po legendi otkrio kulturu vina i način proizvodnje toga božanstvena soka. Dioniz je zavolio tu plemenitu biljku i opojno piće koje se od nje dobije. Sadnice vinove loze poklanjao je ljudima i učio ih proizvoditi vino. Stoga ga je Zeus proglasio bogom vina i vinogradarstva.

Iako se vinova loza, odnosno grožđe uglavnom koristi za proizvodnju vina i rakije, grožđe ima široku primjenu i koristi se za različite druge namjene. Grožđe se može konzumirati u svježem stanju kao stolno grožđe, može se koristiti za sušenje i proizvodnju grožđica, za pripremu svježega ili koncentriranoga soka. U jednom se dijelu Hercegovine od mošta priprema veoma ukusan žele, tzv. ćufter. Osim toga iz sjemena grožđa moguće je proizvoditi ulje, a iz pokožice crnih sorata proizvode se pigmenti antocijani. U nekim islamskim zemljama, velikim proizvođačima grožđa poput Turske, Irana,

INTRODUCTION

Noah, a farmer, planted a vineyard
The Book of Genesis (9.20)

Grapevines and wine are an integral part of human civilization from prehistoric times to the present day. Grape is the most important fruit crop in the world. It is cultivated in diverse climate conditions, but it is primarily a crop of the temperate climate zone. According to the Bible, after the Flood ended, it was grapevines of all of the cultivated species that Noah planted first. Grapes and wine are mentioned in the Bible in many places and in different connotations. Although consumption of alcohol is forbidden in Islam, the Koran mentions grapevines, and some distinctly Islamic countries are major producers of grapes.

Grapevine is a divine plant and wine is a divine drink since ancient times. Grapevine is one of rare cultivated species that has its divinity. In Greece it was Dionysus, and in Rome Liber. According to legend, Dionysus discovered the culture of wine and the method or production of this divine juice. Dionysus came to like this noble plant and the heady drink made from it. He kept giving people grapevine seedlings and teaching them how to produce wine. Therefore, Zeus proclaimed him the god of wine and viticulture.

Although vines, or grapes, are used mainly for the production of wine and brandy, grapes have a wide application and are used for various other purposes. Grapes can be consumed fresh as table grapes, can be used for drying and production of raisins, for preparation of fresh or concentrated juice. In one part of Herzegovina, must is used for preparation of a very tasty jelly, the so-called chufter. In addition, it is possible to produce oil from grape seeds, and pigments anthocyanins are produced from the skin of red varieties. In some

Egipta, vinova loza se gotovo isključivo koristi za proizvodnju nealkoholnih proizvoda.

Bosna i Hercegovina ima tisućljetnu tradiciju uzgoja vinove loze, ali u usporedbi s drugim vinogradarskim državama površine pod vinovom lozom su male. U predosmansko vrijeme vinova loza uzgajana je na velikim površinama, ne samo u Hercegovini već i u Bosni i po dostupnim podacima u Bosni je u to vrijeme bilo više vinove loze nego u Hercegovini. No tijekom minulih stoljeća vinogradarstvo je u Bosni zamrlo, a uzgoj vinove loze održao se u Hercegovini, tako da se danas kada se govori o vinogradarstvu Bosne i Hercegovine misli samo na Hercegovinu.

Međutim, klimatski i zemljišni uvjeti u nekim područjima sjeverne Bosne izrazito su povoljni za uzgoj vinove loze, pa se uz odabir odgovarajućih sorata i podloga na tom području vinogradarstvo opet može razviti. To se već pokazuje jer se posljednjih petnaestak godina vinova loza sve više širi na tom području, za sada najviše na području Banjalučke regije, oko Laktaša, Banja Luke, Gradiške, Čelinca i Prnjavora. Već se osnivaju i nove vinarije, a vina iz sjeverne Bosne polako se probijaju na tržište. Područje sjeverne Bosne ime također velikoga potencijala u proizvodnji stolnoga grožđa, budući da po svojim agroekološkim uvjetima i zemljišnim kapacitetima ima mogućnosti za takvu proizvodnju. Zbog velikog nerazmjera u proizvodnji i potrošnji stolnoga grožđa u Bosni I Hercegovini, ovo područje bi moglo biti izvor smanjenja te neravnoteže.

Na području Hercegovine uzgajaju se uglavnom autohtone sorte koje su se kroz stoljeća uzgoja prilagodile ovom podneblju u kojemu najbolje izražavaju svoje sortne karakteristike i potencijale. U ambijentalnim uvjetima Hercegovine te sorte daju vina izvrsne kakvoće i prepoznatljivih organoleptičkih svojstva. Po tome su hercegovačka vina Žilavka i Blatina poznata i priznata u svijetu, od Bečkog dvora do dalekog Japana. Čak se nakon Prvoga svjetskog rata, po jednom tadašnjem izvješću, hercegovačka Blatina u Brazilu prodavala u ljekarni kao ljekovito vino. Stoga nije čudno da su krajem šezdesetih i početkom sedamdesetih godina prošloga stoljeća Žilavka i Blatina zaštićena kao čuvena vina s geografskim podrijetlom, kao prva kontinentalna

Islamic countries, major producers of grapes such as Turkey, Iran, Egypt, grapes are almost exclusively used for production of non-alcoholic products.

Bosnia and Herzegovina has a millennia-old tradition of cultivation of grapes, but compared to other wine-growing countries, areas planted with vines are small. In pre-Ottoman times, grapevines were grown in large areas, not only in Herzegovina but also in Bosnia, and according to the available data, at that time there were more vines in Bosnia than in Herzegovina. But during the past centuries viticulture in Bosnia died out, and cultivation of vines was maintained in Herzegovina, so today to speak about viticulture of Bosnia and Herzegovina means to speak of viticulture of Herzegovina only.

However, in some areas of northern Bosnia, climate and soil conditions are markedly favorable for cultivation of grapes, and with selection of appropriate varieties and rootstocks, viticulture can be developed in this area again. This is already manifested because grapevines have been increasingly spreading over this area in the last fifteen years, at present mostly in the Banja Luka region around Laktasi, Banja Luka, Gradiska, Celinac and Prnjavor. New wineries are already being established, and wines from northern Bosnia gradually make their way to the market. The area of northern Bosnia also has a high potential for production of table grapes, since such production would be facilitated by its agroecological conditions and land capacities. There has been a large imbalance between production and consumption of table grapes in Bosnia and Herzegovina, and this area could be a source of reducing the imbalance.

It is mainly the autochthonous varieties that are cultivated in the area of Herzegovina, the varieties that, through centuries of cultivation, have accommodated to the terroir in which they best express their varietal characteristics and potentials. In Herzegovinian environmental conditions, these varieties give wines of excellent quality and recognizable organoleptic characteristics. That is what Herzegovinian wines Zilavka and Blatina are known of and recognized by in the world, from the Court of Vienna to the remote Japan. Herzegovinian Blatina was even

vina koja su dobila takvu zaštitu u bivšoj državi.

Vinarstvo postaje sve važniji dio gospodarstva Bosne i Hercegovine. Za vrijeme socijalističkoga sustava u cijeloj Bosni i Hercegovini postojalo je pet vinarija, a sve su bile u državnom vlasništvu u sklopu kompanije HEPOK. Budući da je većina vinograda bila u vlasništvu malih vinogradara, veći dio grožđa prerađivao se u malim privatnim podrumima bez stručna vođenja, što je za posljedicu imalo neujednačenu, a ponekad i slabiju kakvoću vina. Posljednjih dvadesetak godina osnovan je veliki broj privatnih podruma različita kapaciteta. Svi oni imaju modernu opremu i tehnologiju proizvodnje koja jamči proizvodnju vina vrhunske kakvoće. Uz čuvena vina Žilavku i Blatinu pojavljuju se i novi vinski proizvodi, proširuje se asortiman ponude tako da se može zadovoljiti sve zahtjevnije tržište, a to je dobra osnova i za povećanje izvoza. Dobro organizirano vinarstvo može imati pozitivan učinak na unapređenje vinogradarstva, a to može u većoj mjeri povećati zaposlenost i unaprijediti gospodarstvo u ruralnim područjima.

Za hercegovačke vinogradare loza je više od obične biljke, a vino je više od obična poljoprivrednoga proizvoda. Vino se u nas smatra prehrambenim proizvodom. Dobar objed nezamisliv je bez vina, a u slavu vina i u nas se pjevaju pučke pjesme. Vinova loza, a napose vina Žilavka i Blatina postali su zaštitni znak Hercegovine. U svakoj općini u kojoj se uzgaja vinova loza postoji barem jedna vinogradarsko-vinarska manifestacija ili pučka veselica na kojima se slave grožđe i vino. Iako u vinarski sektor Hercegovine opća globalizacija sve više uvodi industrijsku tehnologiju s velikim vinskim podrumima, Hercegovci se ne odriču prakse vlastite pripreme vina. Svaki vinogradar ima svoj podrum i proizvodi vino za vlastite potrebe. Bez vlastita podruma i vina hercegovački vinogradar osjećao bi se siromašniji. U današnjim ekonomskim odnosima i proizvodnim troškovima uzgoj loze na malim parcelama, kakve dominiraju u Hercegovini, i proizvodnja vina od grožđa s tih parcela ne može nikako biti profitabilna. No to hercegovačkim vinogradarima ništa ne znači. Oni će uzgajati lozu i proizvoditi vlastito vino, bez obzira koliko ih to stajalo. Jer većina se malih vinogradara vinogradarstvom bavi iz ljubavi, a ne radi profita.

sold as a medicinal wine in pharmacies in Brazil after the First World War, according to a report from that time. It is therefore not surprising that Zilavka and Blatina were protected as famous wines with geographic origin in the late 1960s and early 1970s, as the first continental wines to have been awarded such protection in the former state.

Winemaking is becoming an increasingly important part of the economy of Bosnia and Herzegovina. During the former socialist system, there were five wineries in the entire Bosnia and Herzegovina, and they were all owned by the state as part of the Hepok company. Since most of the vineyards were owned by small growers, most of the grapes were processed in small privately-owned cellars without professional guidance, which resulted in an inconsistent and sometimes inferior quality of wine. A large number of privately-owned cellars of different capacities have been established in the last twenty years or so. They all have modern equipment and production technology that guarantee the production of premium quality wines. In addition to the famous wines Zilavka and Blatina, there are also new wine products, the range of supply expands to satisfy the increasingly demanding market, and that is a good basis for increasing exports as well. A well organized winemaking may have a positive effect on improving viticulture, which in turn may significantly increase employment rates and improve the economy in rural areas.

For Herzegovinian wine-growers, vine is more than an ordinary plant, and wine is more than a common agricultural product. In our area, wine is considered a foodstuff. It is not possible to imagine a good meal without wine, and folk songs are sung in celebration of wine in our area. Grapevines, and especially Zilavka and Blatina wines, have become a trademark of Herzegovina. In each municipality in which grapes are grown, there is at least one viticultural and winemaking event or popular festivity celebrating grapes and wine. Although the general globalization increasingly introduces industrial technology with large wine cellars in the winemaking sector of Herzegovina, Herzegovinians do not give up the practice of making their own wine. Every winegrower has his own cellar and produces

Neka i ova monografija bude skromni dar bosanskohercegovačkim vinogradarima i njihovoj ljubavi prema ovoj božanskoj kulturi.

wine for his own needs. Without his own cellar and wine, Herzegovinian winegrower would feel much poorer. In today's economic relations and production costs, cultivation of vines on small plots that dominate in Herzegovina, and production of wine from grapes from these plots definitely cannot be profitable. But that does not mean anything to Herzegovinian winegrowers. They will grow grapes and produce their own wine no matter how much it costs them. Because most of small wine-growers are engaged in wine-growing out of love, and not for the sake of profit.

Let this monograph too be a modest gift to Bosnian and Herzegovinian winegrowers and their love for this divine crop.

PODRIJETLO I ŠIRENJE VINOVE LOZE

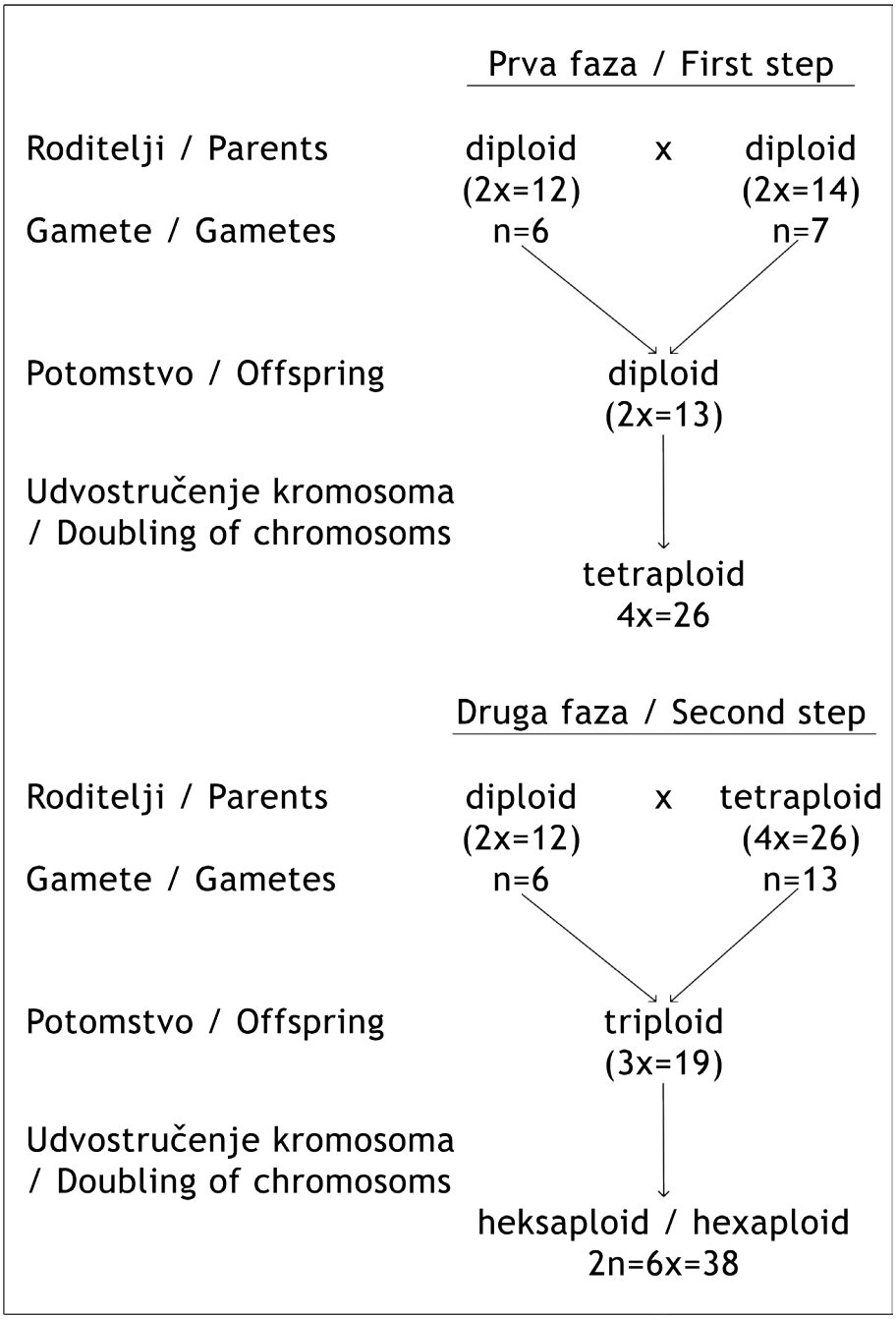
Evolucija i domestikacija vinove loze
Jure Beljo

Po sistematskoj klasifikaciji vinova loza spada u porodicu *Vitaceae* koja se sastoji od 14 rodova i više od 1000 vrsta. Jedini rod koji ima poljoprivredno značenje je *Vitis*. Rod *Vitis* podijeljen je u dva podroda: *Muscadinia* 2n = 6x = 40 i *Euvitis* 2n = 6x = 38, u kojemu se nalazi kultivirana vrsta *Vitis vinifera*. Cijeli rod ima veliki broj vrsta u tri različita centra genetske raznolikosti: istočnoazijski, europski i srednjoazijski i američki. Istočnoazijska skupina obuhvaća oko 40 vrsta na širokom području: Kine, Japana i južno do Jave (Alleweldt i sur. 1990.). Najpoznatija je među njima *V. amurensis* koja nije kultivirana, ali u nekim se područjima Kine i Japana koristi za jelo, sok ili žele (Huang, 1980.). Europska i srednjoazijska skupina sastoji se od samo jedne vrste: *V. vinifera* L. koja ima dvije podvrste: *V. vinifer*a subspecies *sativa* i *V. vinifera* subspecies *sylvestris* Gmel. Američka skupina roda *Vitis* obuhvaća tridesetak vrsta i međuvrsnih hibrida, a najpoznatije su među njima: *V. aestivalis, V. berlandieri, V. cinerea, V. labrusca, V. riparia, V. rupestris*. Neke su američke vrste poput *V. labrusca*, poznata kao lisičje grožđe, udomaćene kad su Europljani došli u Novi svijet, a druge su križane s *V. vinifera* da bi se dobili hibridi otporni na filokseru. Premda se vinova loza tretira i ponaša kao diploid, ona je nekadašnji poliploid jer sadrži šest genoma. Nastala je križanjem tri različita diploidna roditelja. Početni broj kromosoma bio je 6 ili 7 i došlo je do diploidizacije (Briggs i Walters, 1986.), (slika 1.).

ORIGIN AND SPREADING OF GRAPEVINE

Evolution and domestication of grapevine
Jure Beljo

By systematic classification, grapevine is part of the family *Vitaceae*, which consists of 14 genera and over 1000 species. The only genus that has an agricultural significance is *Vitis*. The genus *Vitis* is divided into two subgenera: *Muscadinia* 2n = 6x = 40, and *Euvitis* 2n = 6x = 38, which contains the cultivated species *Vitis vinifera*. The entire genus has a large number of species in three different genetic diversity centers: East Asian, European and middle Asian, and American. The East Asian group includes about 40 species in the wide region of China, Japan and south to Java (Alleweldt et al., 1990). The most commonly known among them is *V. amurensis*, which is not cultivated; however, it is used as food, juice or jelly in some parts of China and Japan (Huang, 1980). The European and middle Asian group consists of only one species, *V. vinifera* L. that has two subspecies: *V. vinifera* subspecies *sativa* and *V. vinifera* subsp. *sylvestris* Gmel. The American group of the genus *Vitis* includes about thirty species and interspecific hybrids, and the most commonly known among them are *V. aestivalis, V. berlandieri, V. cinerea, V. labrusca, V. riparia, V. rupestris*. Some American species like *V. labrusca,* known as fox grapes, were domesticated when the Europeans arrived in the New World, while others were used for crossing with *V. vinifera* to produce hybrids resistant to phylloxera. Although grapevine is considered and behaves as diploid, it is an ancient polyploid because it contains six genomes. It was developed by crossing three different diploid parents. The initial number of chromosomes was 6 or 7 and diploidization resulted in actual species (Briggs and Walters, 1986) (Figure 1).



Slika 1. Evolucija vinove loze
Figure 1. Evolution of grapevine

Domestikacija vinove loze započela je u neolitiku, 6.000 do 6.500 godina prije Krista (McGovern, 2003.). Općenito se smatra da je domestikacija vinove loze (*V. vinifera)* započela u južnom Kavkazu (Zohary i Siegel-Roy, 1975., Jackson, 1994.) na području današnje Gruzije, Armenije i Azerbajdžana odakle se širila u Europu i sjevernu Afriku. Međutim postoje dvojbe o mjestu gdje je nastala domestikacija. Postoje tvrdnje da je domestikacija nastala neovisno i u Španjolskoj (Nunez i Walker, 1989.). *V. vinifera* ssp. *sylvestris* imala je široko geografsko područje, a divlje su

Domestication of grapevine began in the Neolithic, 6.500 to 6.000 BC (McGovern, 2003). Domestication of grapevine (*V. vinifera)* is generally considered to have begun in the Southern Caucasus (Zohary and Siegel-Roy, 1975, Jackson, 1994) in the present-day Georgia, Armenia and Azerbaijan, from where it spread to Europe and North Africa. However, there are doubts about where the domestication originated. There are claims that domestication also independently occurred in Spain (Nunez and Walker, 1989). *V. vinifera* ssp. *sylvestris* had a

populacije vjerojatno korištene kao izvor hrane na tim područjima. Genetske analize europskih kultivara vinove loze pokazale su da su sve populacije *V. vinifera* genetički bliskije istočnom tipu *V. sylvestris* nego zapadnom (Myles i sur., 2011.). No analiza mikrosatelita kloroplasta nekih zapadnoeuropskih kultivara pokazala je bitne razlike u odnosu na sorte s Kavkaza i Srednjega istoka, što bi potvrđivalo teoriji o dva mjesta domestikacije ili barem centrima raznolikosti (Arroyo-Garcia i sur., 2006., Imazio i sur., 2006.). Nedavni rezultati uz korištenje 6.000 SNP-markera raspodijeljenih preko genoma loze dali su jaku potporu teoriji o bliskoistočnom podrijetlu vinove loze, ali je također pronađen i ograničen protok gena između zapadne *V. vinifera* ssp. *sylvestris* i *V. vinifera* (Myles i sur., 2011.).

Teoriji o domestikaciji vinove loze u planinskom području između Crnoga mora i Kaspijskoga mora bliska je tzv. Noina hipoteza. Nazvana je tako, jer je po Bibliji Noa, nakon što se zaustavio na planini Ararat, najprije zasadio lozu (Knjiga postanka 8.4 i 9.20). Biblijski iskaz o podrijetlu podudara se s kasnijom verzijom u Epu o Gilgamešu. Genetske analize nekih suvremenih sorata iz Gruzije s poznatim europskim sortama, Pinot Noir, Syrah, Nebbiolo, pokazale su njihovu veliku bliskost. To bi bio dokaz o podrijetlu vinove loze s toga područja, što se podudara s Noinom hipotezom (http://winestory.com/2i.html). Valja reći da svi indoeuropski jezici imaju sličan naziv za vino, što govori o zajedničkom podrijetlu vinove loze.

Nedavna proučavanja mikrosatelitne DNK više od 100 kultivara iz Grčke, Hrvatske, sjeverne Italije, Austrije, Njemačke, Francuske, Španjolske i Portugala pokazala su da je loza svakoga područja bila genetski udaljena što znači da je divlja komponenta u svakom području doprinijela stvaranju genotipova ili je bilo posebno udomaćeno (McGovern, 2003.). No rezultati su ipak pokazali da je plemenita loza unesena iz njezina centra podrijetla oko Crnoga mora, a naknadno je dolazilo do međukrižanja s lokalnom divljom lozom.

Nekoliko je morfoloških i biokemijskih svojstava povezanih s evolucijom i domestikacijom *V. vinifera* koji su doprinijeli formiranju vinove loze kakvu danas poznajemo. Velika genetska promjena u domestikaciji loze bila je prijelaz s

wide geographic range and wild populations were probably used as a source of food in those areas. Genetic analyses of European grapevine cultivars have shown that all populations of *V. vinifera* are genetically closer to eastern *V. sylvestris* type than to western (Myles et al., 2011). But chloroplast microsatellite analysis of some Western European cultivars showed significant differences in relation to varieties from the Caucasus and the Middle East, which would corroborate the theory of two domestication places, or at least diversity centers (Arroyo-Garcia et al., 2006, Imazio et al., 2006). Recent results using 6.000 SNP markers distributed across the grape genome provided strong support to the theory of a Middle East origin of grapevine, but also revealed a limited gene flow between western *V. vinifera* ssp. *sylvestris* and *V. vinifera* (Myles et al., 2011).

The theory of grapevine domestication in the mountainous region between the Black and Caspian Sea is close to the so-called „Noah hypothesis“. It is called so because, according to Bible, Noah first planted grapevine after he was stopped on the Ararat mountains (Genesis 8.4 and 9.20). The biblical account of the origin coincides with a later version in the epic of Gilgamesh. Genetic analysis of some modern varieties from Georgia with commonly known European varieties Pinot Noir, Syrah, Nebbiolo, have shown their high closeness. That would be a proof of grapevine originating in that area, which coincides with the “Noah hypothesis” (http://winestory.com/2i.html). It should be said that all Indo-European languages have similar names for wine, which is indicative of the common origin of grapevine.

Recent microsatellite DNA studies of more than 100 cultivars from Greece, Croatia, northern Italy, Austria, Germany, France, Spain and Portugal have shown that the grapevine of each region was genetically distinct, implying that the wild component in each area had contributed to formation of the genotype or was separately domesticated (McGovern, 2003). The results have nevertheless shown that the cultivated grapevine was introduced from its center of origin around the Black Sea and subsequently intercrossed with local wild grapevines.

There are several morphological and biochemical

dvodomosti na jednodomost i hermafroditizam. Sve su ostale vrste roda *Vitis*, pa i *V. sylvestris,* dvodome vrste; one mogu biti muške ili ženske i samo u rijetkim slučajevima dvospolne, dok je *V. vinifera* u pravilu dvospolna, a samo su iznimno neki kultivari jednospolni. Bitne su razlike između kultivirane loze i njezinih divljih srodnika također veća ujednačenost zriobe bobica unutar grozda, viši sadržaj šećera i selekcija za širi opseg boja ploda (Olmo, 1995.). Nedavna selekcija besjemenosti postala je ključna za stolno grožđe i proizvodnju grožđica.

Širenje vinove loze u svijetu
Jure Beljo

Nakon početnoga kultiviranja trebale su stotine, ako ne i tisuće godina uzgoja vinove loze i pripremanje vina u brdskom području neolitskih naselja drevnoga Bliskog istoka da bi se u tome postigla dostatna vještina koju su drugi prihvaćali i dalje širili. Izum posuđa u neolitskom razdoblju bilo je ključno za preradu i skladištenje vina. U četvrtom tisućljeću prije Krista iz Transkavkazijskoga područja proširila se na Bliski istok i u dolinu Nila. Pisana povijest vinove loze traje više od 6.000 godina. Prvi pisani trag o grožđu i vinu potječe iz vremena Sumerana iz trećega tisućljeća prije Krista, a nalazimo ga u Epu o Gilgamešu. U Egiptu su nađeni hijeroglifski zapisi o vinskim prešama stari više od 5.000 godina (Petrie, 1923.), a u grobnicama prve egipatske dinastije pronađene su posude za vino. Vino je bilo rezervirano samo za faraone, visoke državne dužnosnike i svećenike. Oko 1.700. godine prije Krista kralj Hamurabi je u Babilonu donio pravila o trgovini vinom, što se smatra prvim zakonom o alkoholnim pićima u svijetu. To znači da je vinogradarstvo i proizvodnja vina već tada bila važna gospodarska djelatnost.

Iz istočne Turske, odnosno Anadolije najprije su Hetiti, poznati narod iz rane antike, 3.000 godina prije Krista, proširili vinovu lozu dijelovima istočnoga Mediterana. Iz istočnoga Mediterana vinova loza postupno se širila prema zapadu do Cipra, Grčke i Krete. U Grčkoj i na Kreti početak vinogradarstva mogao bi se datirati na početak petoga tisućljeća (Valamoti, 2007.). Grci i Feničani širili su dalje vinovu lozu po Sredozemlju,

properties associated with evolution and domestication of *V. vinifera* that contributed to formation of the grapevine as we know it today. A major genetic change in the domestication of grapevine was its transition from dioecy to monoecy and hermaphroditism. All other species of the genus *Vitis*, including *V. sylvestris,* are dioecious; they can be male or female, and only in rare cases bisexual, while *V. vinifera* is generally bisexual, and only exceptionally some cultivars are monosexual. Significant differences between cultivated grapevine and its wild relatives are also more uniform ripening of berries within bunches, higher content of sugar and selection of a wider range of fruit colors (Olmo, 1995.). The recent selection of seedlessness has become essential for the production of table grapes and raisins.

Grapevine spreading in the world
Jure Beljo

After the initial cultivation, it took hundreds, if not even thousands of years of grapevine growing and wine making in the hilly areas of Neolithic settlements in the ancient Middle East to achieve sufficient skill that others accepted and continued to spread. The invention of dishes in the Neolithic period was crucial for processing and storage of wine. In the fourth millennium BC it spread from the Transcaucasian area to the Middle East and the Nile Valley. Written history of grapevine is over 6,000 years old. The first written record of grapes and wine dates from the time of the Sumerians in the third millennium BC, and it can be found in the Epic of Gilgamesh. Over 5,000 years old hieroglyphic records on wine presses were found in Egypt (Petrie, 1923), and wine containers were found in tombs of the first Egyptian dynasty. Wine was reserved only for pharaohs, high government officials and priests. About 1,700 BC, the King Hammurabi of Babylon introduced the first code on wine trading, which is considered to be the first law on alcoholic beverages in the world. That means that viticulture and winemaking were already important economic activities.

Hittites, well-known people from early antiquity, spread grapevine first from eastern Turkey or Anatolia into parts of the eastern Mediterranean 3,000 BC. From the eastern Mediterranean,

odnosno po obalnim područjima sjeverne Afrike, Španjolske, Francuske i Italije. Najstariji dokazi o uzgoju vinove loze u Italiji potječu iz 9. stoljeća prije Krista. Uzgoj vinove loze i proizvodnju vina od Feničana i Grka najprije su preuzeli Etruščani. Etruščani su unaprijedili proizvodnju vina i razvili trgovinu njime u Mediteranskom bazenu. Rimljani su dalje unaprijedili tehniku naučenu od Etruščana. Vinova loza i vino spominju se u više djela rimskih pisaca: De AgriCultura Katona Starijeg (oko 160. godine prije Krista), De re rustica Marcusa Terentija Vara, a najviše u poznatom djelu Naturalis Historiae Plinija Starijeg.

Rimljani su širili uzgoj vinove loze po Europi. Na osvojenim područjima naseljavali su svoje kolone i isluženе veterane koji su se bavili poljoprivredom i, ako su bili povoljni uvjeti uvodili nove kulture do tada nepoznate u tom području. Rimljani su uveli proizvodnju vinove loze u kontinentalnoj Francuskoj, u dolini Rajne u Njemačkoj, pa čak i na obalama Engleske. Uglavnom nakon pada Rimskoga carstva vinova loza bila je raširena po cijelom Mediteranu, a djelomice i u unutrašnjosti Europe.

grapevine was gradually expanded westward to Cyprus, Greece and Crete. The beginning of viticulture in Greece and Crete could be dated to the beginning of the fifth millennium (Valamoti, 2007). The Greeks and Phoenicians spread the grapevine further in the Mediterranean, into the coastal areas of North Africa, Spain, France and Italy. The earliest evidence of grapevine cultivation in Italy originates from the 9th century BC. It was the Etruscans who first took over grapevine cultivation and winemaking from the Phoenicians and Greeks. The Etruscans improved winemaking and developed wine trading in the Mediterranean basin. The Romans further advanced the technique learned from the Etruscans. Grapevine and wine were mentioned in a number of works of Roman writers: De Agri Cultura by Cato the Elder, (around 160 BC), De Re Rustica by Marcus Terrentius Varro, and most of all in the famous work Naturalis Historiae by Pliny the Elder.

The Romans spread cultivation of grapevine in Europe. In conquered territories, they settled their colonies and retired veterans who engaged in farming and, if conditions were favorable,



Slika 2.: Berba grožđa na etruščanskoj terakoti iz 6. stoljeća prije Krista
Figure 2.: Grape harvest on Etruscan terracotta from the 6th century BC

Nakon propasti Rimskoga carstva u ranom srednjem vijeku, i velikih seoba naroda i ratova po Europi, dolazi do stanovite krize u vinogradarstvu. No od 5. stoljeća pa nadalje, kada kršćanska vjera širi svoj utjecaj po Europi, vinogradarstvo i vinarstvo ponovo doživljava geografsko širenje. Vinogradarstvo su do 10. stoljeća u najvećim dijelom održavali različiti vjerski redovi i samostani. Benediktinci, a i drugi redovi širili su uzgoj vinove loze u sjevernija područja, a vinograde su podizali na višim nadmorskim visinama. U dunavskom području i Podunavlju veće širenje vinogradarstva postignuto je tek u 12. stoljeću, iako je na srednjoj Rajni dokazano već u 6. stoljeću (Kulischer, 1957.). Usporedo s "crkvenim" vinogradarstvom razvijalo se također, napose u Francuskoj, "plemenitaško" vinogradarstvo, koje je prakticirala aristokracija kao simbol prestiža. U međuvremenu je na Bliskom istoku vinogradarstvo također bilo važna ekonomska aktivnost do pojave islama u 7. stoljeću, nakon čega počinje njegovo opadanje.

Između ranoga srednjega vijeka i renesanse vinogradarstvo je opet počelo cvjetati. Povećanje stanovništva u gradovima i povećana potrošačka moć obrtnika i trgovaca povećala je ulaganje u vinogradarstvo, što je još jednom postalo gospodarski ostvarljivo. U renesansi počinju prva znanstvena proučavanja vinove loze i tada se pojavljuju začeci moderne ampelografije.

Iz Europe su između 17. i 19. stoljeća lozu po svijetu raširile kolonijalne sile, uvodeći je u svoje kolonije. U sjevernu Ameriku vinova loza uvedena je u 17. stoljeću, najprije u španjolske misije na jugozapadu, a potom u Kaliforniju. Nakon toga loza se širi u Afriku, južnu Ameriku i Australiju. U sjevernoj Americi nastali su hibridi između introducirane plemenite loze i američkih vrsta roda *Vitis*. Kasnije su američke vrste iskorištene kao podloge u zaštiti kultivirane loze od filoksere.

U Europi je vinova loza koncentrirana u središnjim i južnim područjima, u Aziji u zapadnim područjima poput Turske i Bliskoga istoka, te na istoku u Kini. U Africi je najraširenija duž obala Mediterana i u južnoj Africi. U sjevernoj Americi je vinogradarstvo najrazvijenije u Kaliforniji, ali i drugim dijelovima, a u južnoj Americi u Čileu, Argentini, Brazilu. U novije vrijeme uzgoj vinove loze širi se sve više u Australiji i Novom

introduced new crops previously unknown in the areas. It is the Romans who introduced the production of grapevine in the continental France, the Rhine Valley in Germany, and even on the shores of England. After the fall of the Roman Empire, grapevine was generally spread throughout the Mediterranean, and partly in the heartland of Europe as well.

After the collapse of the Roman empire in the early Middle Ages, and after large migrations and wars in Europe, a crisis in viticulture ensued. But from the 5th century onward, when the Christian faith spread its influence in Europe, viticulture and winemaking experience a geographic expansion again. Until the 10th century, viticulture was mostly maintained by various religious orders and monasteries. Benedictines and other orders expanded grapevine growing further into northern regions and established vineyards at higher altitudes as well. A major spread of viticulture into the Danube area and the Danube basin was not achieved until the 12th century, although in the middle Rhine it was proven as early as in the 6th century (Kulischer, 1957). The "noble" viticulture was also developing in parallel with the "church" viticulture. It was practiced by aristocracy as a symbol of prestige, especially in France. In the meantime, viticulture was a significant economic activity in the Middle East too until the emergence of Islam in the 7th century, after which its decline began.

Viticulture began to flourish again between the early Middle Ages and Renaissance. Population increase in cities and increased purchasing power of craftsmen and traders increased investment in viticulture, which once again became economically feasible. First scientific studies of grapevine started in Renaissance and it is then that beginnings of modern ampelography occurred.

Between the 17th and 19th centuries, colonial powers spread grapevine from Europe throughout the world, introducing it in their colonies. Grapevine was introduced in North America in the 17th century, first in Spanish missions in the southwest, and then in California. Grapevine was thereafter spread into Africa, South America and Australia. In North America, hybrids between the introduced cultivated grapevine and american species of the genus *Vitis* were developed. The

Zelandu.Danas su glavna istraživanja vinove loze usmjerena na genetička istraživanja, izradu genomske karte, određivanje lokacije i funkcije gena i iskorištavanje tih spoznaja u praktične svrhe, te izrade genetskih profila germplazme vinove loze.

Loza i grožđe na starim novcima

Radoslav Dodig

Od pojave prvoga kovanog novca prije 26 stoljeća (oko 610. pr. Kr.) u Maloj Aziji, na njima su se počele nizati različite predstave, bilo s prednje strane (avers) bilo sa stražnje strane (revers). Uz česte reljefe bogova i božica (Zeus, Atena, Hermo, Posidon, Mars, Venera i dr.) i portrete vladara (Aleksandar Veliki, Cezar, August i dr.), javljaju se, između ostalih, predstave pehara za vino (krater i kantharos) i amfora, ali i grožđa, katkad i vinove loze. Odabrali smo kraći pregled

American species were later used as rootstock in protection of cultivated grapevine from phylloxera.

In Europe, grapevine is concentrated in the central and southern areas, in Asia in western regions like Turkey and the Middle East, and in the east in China. In Africa it is the most widespread along the Mediterranean coast and in South Africa. In North America, viticulture is the most developed in California, but also in other regions, and in South America in Chile, Argentina and Brazil. More recently, cultivation of grapevine has been increasingly expanding into Australia and New Zealand.

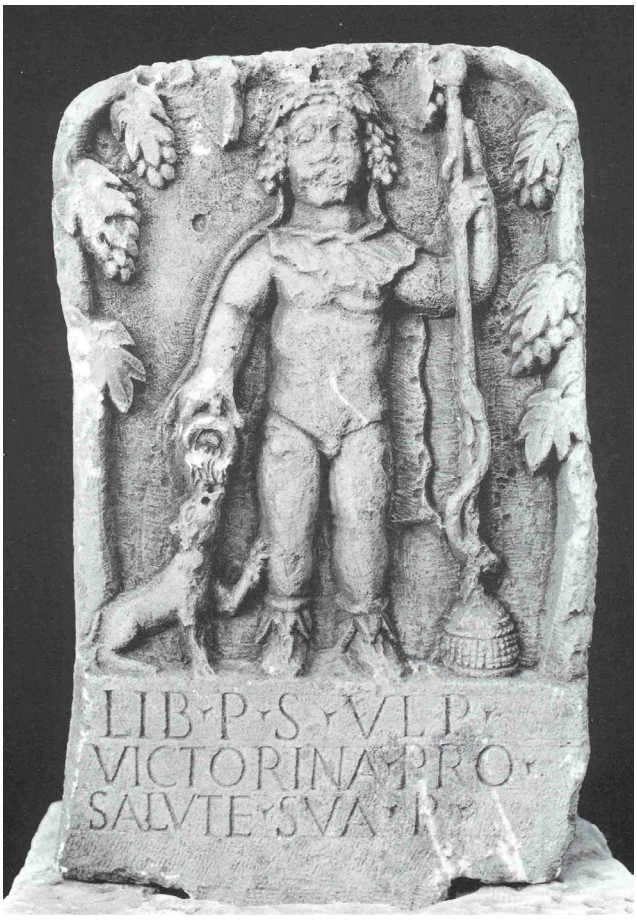
Presently, the main research of grapevine is focused on genetic studies, construction of genome map, determination of location and function of genes and use of these data for practical purposes, and preparation of genetic profiles of grapevine germplasm.

Tablica 1. Proizvodnja grožđa i vina u svijetu u 2011. godini
Table 1. Global production of grape and wine in 2011

Br No	Zemlja Country	Grožđe u t Grape in t	Zemlja Country	Vino u t Wine in t
1.	Kina - China	9.067.000	Italija - Italy	6.590.750
2.	SAD - USA	6.756.449	Francuska - France	4,673,400
3.	Italija - Italy	7.444.881	Španjolska - Spain	3,339,700
4.	Francuska - France	6.588.904	SAD - USA	2,211,300
5.	Španjolska - Spain	5.809.315	Kina - China	1,657,500
6.	Turska - Turkey	4.296.351	Argentina - Argentina	1,547,300
7.	Čile - Chile	3.149.380	Australija - Australia	1,133,860
8.	Argentina - Argentina	2.112.715	Čile - Chile	1,046,000
9.	Iran - Iran	2.112.715	Južna Afrika - South Africa	965,500
10.	Južna Afrika - South Africa	1.683.927	Njemačka - Germany	961,100
11.	Australija - Australia	1.715.717	Portugal - Portugal	694,612
12.	Brazil - Brazil	1.542.068	Rumunjska - Romania	405,817
13.	Egipat - Egypt	1.320.801	Grčka - Greece	303,000
14.	Indija - India	1.235.000	Austrija - Austria	281,476
15.	Njemačka - Germany	1.250.000	Srbija - Serbia	224,431
	Ukupno u svijetu - World total	58.500.118	Ukupno u svijetu - World total	26,216,967

Izvor / source: FAOSTAT, http://faostat.fao.org

starih novčića, s prikazima grožđa i loze, najčešće na srebrnjacima, jer su graveri u njima znali prikazati vrlo jasne i zanimljive motive. Na zlatnicima se rijetko nađe predstava grožđa, dok su na brončanim novcima nešto slabije kvalitete. Najveću produkciju novčića s grožđem i vinovom lozom imaju Sicilija, Tracija, grčki otoci i obalni maloazijski i talijanski gradovi. Kovanje i distribucija novca traži visoku organizaciju vlasti, pa nije čudo što se novčarstvom bave jaki mediteranski gradovi. U Dalmaciji kovnice sa skromnom emisijom novca imaju Hvar i Vis, a u Hercegovini Daorsi, sa središtem u Ošanićima.



Slika 3. Bog Liber, Vašarovine Livno
Figure 3.God Liber, Vasarovine Livno

Vines and grapes on old coins
Radoslav Dodig

Ever since the first coins appeared in Asia Minor 26 centuries ago (around 610 BC), various presentations have been following each other on their faces, whether on the front (obverse) or the back face (reverse). In addition to frequent reliefs of gods and goddesses (Zeus, Athena, Hermes, Poseidon, Mars, Venus, etc.) and portraits of rulers (Alexander the Great, Caesar, Augustus, etc.), there are, among others, presentations of wine cups (crater and kantharos) and amphorae, but also grapes, and sometimes vines. We have chosen a short review of old coins with illustrations of grapes and vines, most often on silver coins, because engravers knew how to show very clear and interesting motifs on them. A motif of grapes can rarely be found on gold coins, while their quality on bronze coins is poorer. The highest production of coins with grapes and vines is found on Sicily, in Thrace, on the Greek islands and in coastal Asia Minor and Italian cities. Minting and distribution of money requires high organization of authorities, so it is not surprising that coinage was the business of strong Mediterranean cities. Among those that had mints with modest emissions of coins were Hvar and Vis in Dalmatia, and Daorsi, based in Osanici, in Herzegovina.



Slika 4. Loza i grožđe na starim novcima
Figure 4. Vines and grapes on old coins

1. Otok Tened, drahma, kasno 5. st. – rano 4. st. pr. Krista, revers, srebro, promjer 15mm, težina 3,43 gr.
2. Soli, Cilicija, stater, oko 440-410. pr. Kr., revers, srebro, promjer 12mm, težina 3,42 gr.
3. Maronija, Tracija, tetradrahma, oko 430-400. pr. Kr., srebro, revers, promjer 20mm, težina 14,10 gr.
4. Nakso, Sicilija, litra, oko 415-403. pr. Kr., srebro, revers, promjer 10mm, težina 0,76 gr.
5. Nagid, Cilicija, stater, oko 400-385. pr. Kr., revers, srebro, promjer 23mm, težina 10.67 gr.
6. Maronija, Tracija, triobol, oko 377-365. pr. Kr., revers, srebro, promjer 14mm, težina 2,78 gr.
7. Tars, Cilicija, stater, 361-334. pr. Kr., revers, srebro, promjer 21mm, težina 10,98 gr.
8. Filip II. Makedonski (359-336. pr. Kr.), tetradrahma, revers, srebro, promjer 21mm, težina 14,3 gr.
9. Soli, Cilicija, obol, oko 350-300. pr. Kr., revers, srebro, promjer 10mm, težina 0,69 gr.
10. Tarent, Kalabrija, nomos, oko 302-280. pr. Kr., revers, srebro, promjer 20mm, težina 7.56 gr.
11. Arsinoja II, žena Ptolemeja II, oktodrahma, oko 270. pr. Kr., revers, zlato, promjer 26mm, težina 27,68 gr.
12. Hij, otok u Joniji, drahma, oko 100-86. pr. Kr., revers, srebro, promjer 19mm, težina 3,82 gr.
13. Domicija Augusta, as, 82-96. po. Kr., revers, bronca, promjer 18mm, težina 3,01 gr.
14. Diadumenijan, as, 217-218. po. Kr., revers, bronca, promjer 17mm, težina 3,39 gr.
15. Njemačka marka, 1951., avers, bakar/nikal, promjer 26,75 mm, debljina 1,87 mm, težina 7 gr.

1.Tenedos island, drachma, late 5th - early 4th century BC, reverse, silver, diameter 15mm, weight 3.43 g
2. Soloi, Cilicia, stater, about 440-410 BC, reverse, silver, diameter 12mm, weight 3.42 g
3. Maroneia, Thrace, tetradrachm, about 430-400 BC, silver, reverse, diameter 20mm, weight 14.10 g
4. Naxos, Sicily, litra, about 415-403 BC, silver, reverse, diameter 10mm, weight 0.76 g
5. Nagidos, Cilicia, stater, about 400-385 BC, reverse, silver, diameter 23mm, weight 10.67 g
6. Maroneia, Thrace, triobol, around 377-365 BC, reverse, silver, diameter 14mm, weight 2.78 g
7. Tarsos, Cilicia, stater, 361-334 BC, reverse, silver, diameter 21mm, weight 10.98 g
8. Philip II of Macedon (359-336 BC), tetradrachm, reverse, silver, diameter 21mm, weight 14.3 g
9. Soloi, Cilicia, obol, about 350-300 BC, reverse, silver, diameter 10mm, weight 0.69 g
10. Tarentum, Calabria, nomos, about 302-280 BC, reverse, silver, diameter 20mm, weight 7.56 g
11. Arsinoe II, wife of Ptolemy II, octodrachm, about 270 BC, reverse, gold, diameter 26mm, weight 27.68 g
12. Chios, island in Ionia, drachma, about 100-86 BC, reverse, silver, diameter 19mm, weight 3.82 g
13. Domitia Augusta, as, 82-96 AD, reverse, bronze, diameter 18mm, weight 3.01 g
14. Diadumenian, as, 217-218 AD, reverse, bronze, diameter 17mm, weight 3.39 g
15. German mark, 1951, obverse, copper/nickel, diameter 26.75 mm, thickness 1.87 mm, weight 7 g

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POVIJEST VINOGRADARSTVA U BOSNI I HERCEGOVINI

Jure Beljo

Od prapovijesti do srednjeg vijeka

Usporedo sa širenjem vinove loze po Sredozemlju, počinje njezin uzgoj na Jadranskoj obali i postupno u Jadranskom zaleđu. Valja reći da su u arheološkim iskopinama iz brončanoga doba u Ripču kod Bihaća (Beck Managetta 1896.) i Donjoj Dolini kod Gradiške (Moly, 1904.) nađene sjemenke vinove loze. Istražujući prehranu prastanovnika Bosne, Benac (1951.) je utvrdio da su se krajem drugoga i početkom prvoga tisućljeća prije Krista ti stanovnici hranili i grožđem. No očito je da te sjemenke ne potječu od kultivirane vinove loze *Vitis vinifera* koja još nije bila došla čak ni u priobalje Jadrana, već su to sjemenke europske divlje loze (loznice) *Vitis sylvestris.* Europska divlja (šumska) loza prisutna je u Europi od zadnjega ledenog doba prije 12.000 godina (Arroyo-Garcia i Revilla, 2013.). Bobice te loze su sitnije, obično kiselije od kultivirane loze, ali grožđe može biti i ukusno. Ranije je u nas bila česta uz stabla i suhozidine oko kuća pa su ljudi koristili to grožđe.

Divlju ili šumsku lozu i danas je moguće pronaći u bazenima Kaspijskog, Crnog, Sredozemnog, Jadranskog mora, na Balkanskom poluotoku a napose u Hercegovini. Ta vrsta na našim prostorima bila je raširena sve dok štetnici i bolesti uneseni iz Amerike (filoksera, plamenjača i pepelnica), te uništenje njihovih prirodnih staništa nisu doveli do postupnoga nestajanja *Vitis sylvestris.* No kod nas je još uvijek ima najviše u dolini Neretve i na rubovima listopadnih šuma. U programu inventarizacije *Vitis sylvestris* koji je proveden 2013. godine, pronađena su na nekoliko lokacija sjeverno od Mostar i u dolini rijeke Krupe u Hutovu Blatu mnogobrojna stabla loze

HISTORY OF VITICULTURE IN BOSNIA AND HERZEGOVINA

Jure Beljo

From prehistory to Middle Ages

As grapevine was spreading in the Mediterranean, its cultivation started on the Adriatic coast and gradually in the Adriatic hinterland. It is noteworthy that grapevine seeds were found in the archaeological remains of the Bronze Age in Ripac near Bihac (Beck Managetta, 1896) and Donja Dolina near Gradiska (Moly, 1904). Exploring the diet of ancient inhabitants of Bosnia, Benac (1951) established that these residents also consumed grapes late in the second and early in the first millennium BC. But it is obvious that those seeds do not come from the cultivated grapevine *Vitis vinifera* which did not reach even the Adriatic coastal areas yet, those were the seeds of the European wild vine (loznica) *Vitis sylvestris.* The European wild (sylvan) vine has been present in Europe since the last Ice Age 12,000 years ago (Arroyo-Garcia and Revilla, 2013). Berries of this grapevine are smaller, usually more acidic than those of the cultivated grapevine, but grapes may also be tasty. It used to be locally common on trees and stone fences around houses, sometimes producing abundant crops, so people used its grapes as food.

Wild or forest vine can be presently found in the basins of the Caspian, Black, Mediterranean and Adriatic Sea, on the Balkan Peninsula, and especially in Herzegovina. This species was widespread in our region until pests and diseases introduced from America (phylloxera, downy and powdery mildew), and the destruction of their natural habitats resulted in gradual disappearance of *V. sylvestris.* But it is still locally found, mostly in the Neretva valley and on edges of deciduous forests. In the program of making an inventory



Slika 5. Europska šumska loza (*V. sylvestris*) u svom prirodnom staništu
Figure 5. European forest vine (*V. sylvestris*) in its natural habitat

za koja se s puno vjerojatnosti može pretpostaviti da predstavljaju *Vitis sylvestris*. Da bi se otklonile dvojbe o identitetu tih stabala, izvršit će se njihova genetska profilacija pomoću genetskih markera.

Kultivirana vinova loza *Vitis vinifera* došla je u naša područja preko Grka. Na području Bosne i Hercegovine u predrimsko vrijeme živjela su ilirska plemena, a u Hercegovini su to bili Ardijejci, Daorsi, Delmati, Autarijati. Dosadašnja istraživanja i literaturni podaci navode na zaključak da do dolaska Grka i osnivanja njihovih kolonija na ovim područjima, Iliri nisu poznavali kulturu vinove loze i vještinu pripreme vina. Prije toga Iliri su pili pivo i jednu vrstu medovine (Grmek, 1950.). U gradu Daorsonu, u Ošanićima kod Stoca, glavnom gradu ilirskoga plemena Daorsa pronađene su amfore za vino, što je bio dokaz trgovine ili proizvodnje vina (Marić, 1996.). Iliri su, prema tome vinovu lozu i vino upoznali preko Grka i uskoro su postali proizvođači, ali i dobri potrošači vina.

of *V. sylvestris* conducted in 2013, numerous vine trees were found at several sites north of Mostar and in the Krupa River valley in Hutovo Blato, which can be assumed with high probability to represent *Vitis sylvestris*. To eliminate doubts about the identity of these trees, they will be genetically profiled using genetic markers.

The cultivated grapevine *Vitis vinifera* came into our region over the Greeks. In the pre-Roman time, Illyrian tribes lived in the area of Bosnia and Herzegovina, and in Herzegovina those were the Ardiaei, Daorsi, Dalmatae, Autariatae. Previous investigations and literature data indicate that the Illyrians were not familiar with the vine crop or wine making skills until the arrival of the Greeks and establishment of their colonies in these areas. Before that, Illyrians were drinking beer and one type of mead (Grmek, 1950). Wine amphorae were found in the town of Daorson, in Osanici near Stolac, the capital of the Illyrian tribe of Daorsi, which was evidence of wine production



Slika 6. Menade, pratiteljice boga Dioniza (2. stoljeće)
Figure 6. Maenads, female followers of god Dionysus (2nd century)

Citirajući grčkoga povjesničara Strabona, Marin Zaninović (1996.) piše da Ardijejski kralj Gencije nije mogao odoljeti vinu pa ga je pio danju i noću, a Ardijejski kralj Agron je 230. godine prije Krista, slaveći pobjedu nad Etolcima umro od prekomjerna konzumiranja vina. Bio je to vjerojatno prvi poznati smrtni slučaj zbog neumjerenosti u piću. Čović (1976.) također piše kako su pripadnici ilirskoga plemena Autarijata bili skloni opijanju.

Daljem širenju vinove loze i unapređenju vinogradarstva doprinijeli su Rimljani koji su to područje zauzeli krajem 3. stoljeća prije Krista. Vinova loza je na ilirsko područje dospjela najvjerojatnije preko Narone, velike luke na Neretvi. Vino se proizvodilo na gospodarstvima koje su podizali isluženi rimski vojnici koji su tu dobivali posjede, ali isto tako na većim gospodarstvima i tzv. rustikalnim vilama (*villae rusticae*). Takva su primjerice postojala u Mogorjelu i Višićima kod Čapljine, u Paniku kod

or trade (Maric, 1996). Consequently, Illyirians became familiar with grapevine and wine over the Greeks, and soon became producers, but also good consumers of wine.

Citing the Greek historian Strabo, Marin Zaninovic. (1996) writes that the Ardiean King Gentius could not resist wine and drank it day and night, while the Ardiaean King Agron, celebrating the victory over Aetolians in 230 BC, died from excessive consumption of wine. This was probably the first known death due to excessive drinking. Covic (1976) also writes that members of the Illyrian tribe of Autariatae were inclined to drink heavily.

Further expansion of grapevine and improvement of viticulture were helped by the Romans who occupied this area at the end of the 3rd century BC. Grapevine reached the Illyrian area most probably through Narona, a large port on Neretva. Wine was produced on farms that were

Bileće i Bihovu kod Trebinja (Škegro, 2004.). Posebno je važna, a danas dobro istražen, bila vila rustika u Mogorjelu kod Čapljine u kojoj su nađeni ostaci posuda za vino i velikoga podruma (Bojanovski, 1988.), a na ulaznom portalu nalazi se reljef s prikazom vinove loze i grožđa. Proizvodnja vina u rimskoj provinciji Dalmaciji nije imala veći učinak na šire prostore Sredozemlja, ali je s lokalnoga stajališta bila veoma profitabilna. Uglavnom se trošila na lokalnom tržištu, ali se dio izvozio (Glicksman, 2007.). Iliri su kao vinoljupci mnogo vina trošili u zemlji, ali je vino bilo i jak izvozni proizvod koji je preko Narone dospio u svjetsku trgovinu. Izvoz vina iz jadranskoga područja dospio je i do Rima preko luke Ostia (Patsch, 1922.). Patsch također, temeljem natpisa na amforama, navodi imena brojnih izvoznih firma s područja Neretve u koje je spadala i donja Hercegovina. No budući da se tada iz Hercegovine vino slalo i u Bosnu gdje je pronađeno malo amfora, pretpostavlja se da se vino tamo prenosilo u kožnim posudama poput mijehova ili pak u drvenim sudovima.

Nađeni reljefi s prikazom Dioniza i Libera na području Livna, Tomislavgrada i Glamoča, mogli bi biti pokazatelj uzgoja vinove loze u antičko vrijeme i na području jugozapadne Bosne., a slično je i u sjeverozapadnoj Bosni oko Bihaća (Škegro, 2004.). Uzgoj vinove loze iz Dalmacije u unutrašnjost, odnosno današnju Hercegovinu i dalje prema Bosni širio se dolinom Neretve i Trebišnjice i njihovih pritoka. U unutrašnjost je vinova loza došla s juga dolinama rijeka, a na sjever je došla nešto kasnije širenjem dunavsko-savsko-dravskim međurječjem od sjevera prema jugu ili od zapada prema istoku, te od juga prema sjeveru širenjem rimskoga carstva (Bojanovski, 1988.).

Sjeverna Bosna, odnosno Bosanska Posavina i Semberija također su već u antičko vrijeme bila vinogradarska područja iako je vinova loza tamo došla kasnije nego u Hercegovinu. Kelti koji su nastanjivali te prostore prije rimskih osvajanja poznavali su vinovu lozu (Majnarić-Pandžić, 2003.). Sjeverna Bosna, odnosno područje sjeverno od Drinjače pripadalo je provinciji Donjoj Panoniji (Bojanovski, 1988.). Razgraničenje između Dalmacije i Panonije išlo je linijom od Bosanskog Novog preko Banje Luke i južno od

established by retired Roman soldiers who were there given land, but also on larger farms and the so-called rustic villas (*vilae rusticae*). Such ones existed, for example, in Mogorjelo and Visici near Capljina, in Panik near Bileca and Bihovo near Trebinje (Skegro, 2004). Especially important, and nowadays thoroughly explored, was the rustic villa in Mogorjelo near Capljina, where remains of wine containers and a large cellar were found (Bojanovski, 1988), and the entry portal contains a relief showing vines and grapes. Production of wine in the Roman province of Dalmatia did not have a major effect on wider Mediterranean regions, but in local terms it was highly profitable. It was consumed mainly in the local market, but a part was exported (Glicksman, 2007). As wine lovers, Illyrians consumed plenty of wine in the country, but wine was also a strong export product that got into world trade through Narona. Wine exported from the Adriatic region also reached Rome through the port of Ostia (Patsch, 1922). Based on inscriptions on amphorae, Patsch also lists names of numerous exporting firms from the Neretva region to which the Lower Herzegovina also belonged. However, as wine was then sent from Herzegovina also to Bosnia, where few amphorae were found, it is assumed that wine was transported in leather containers such as wineskins or maybe in wooden containers.

The discovered reliefs depicting Dionysus and Liber in the area of Livno, Tomislavgrad and Glamoc, may be an indication of grapevine cultivation in ancient times in the region of southwestern Bosnia too, and likewise in the northwestern Bosnia around Bihac (Skegro, 2004). Cultivation of grapevine was spread from Dalmatia to the hinterland, or the present Herzegovina and further toward Bosnia, through valleys of the Neretva and Trebišnjica rivers and their tributaries. Grapevine reached the heartland from the south through river valleys, and came to the north slightly later as it spread through the Dunav-Sava-Drava Interamnium southward from the north and eastward from the west, and northward from the south by the expansion of the Roman Empire (Bojanovski, 1988).

Northern Bosnia, or Bosnian Posavina and Semberija were also viticultural areas in ancient times although grapevine arrived there later than



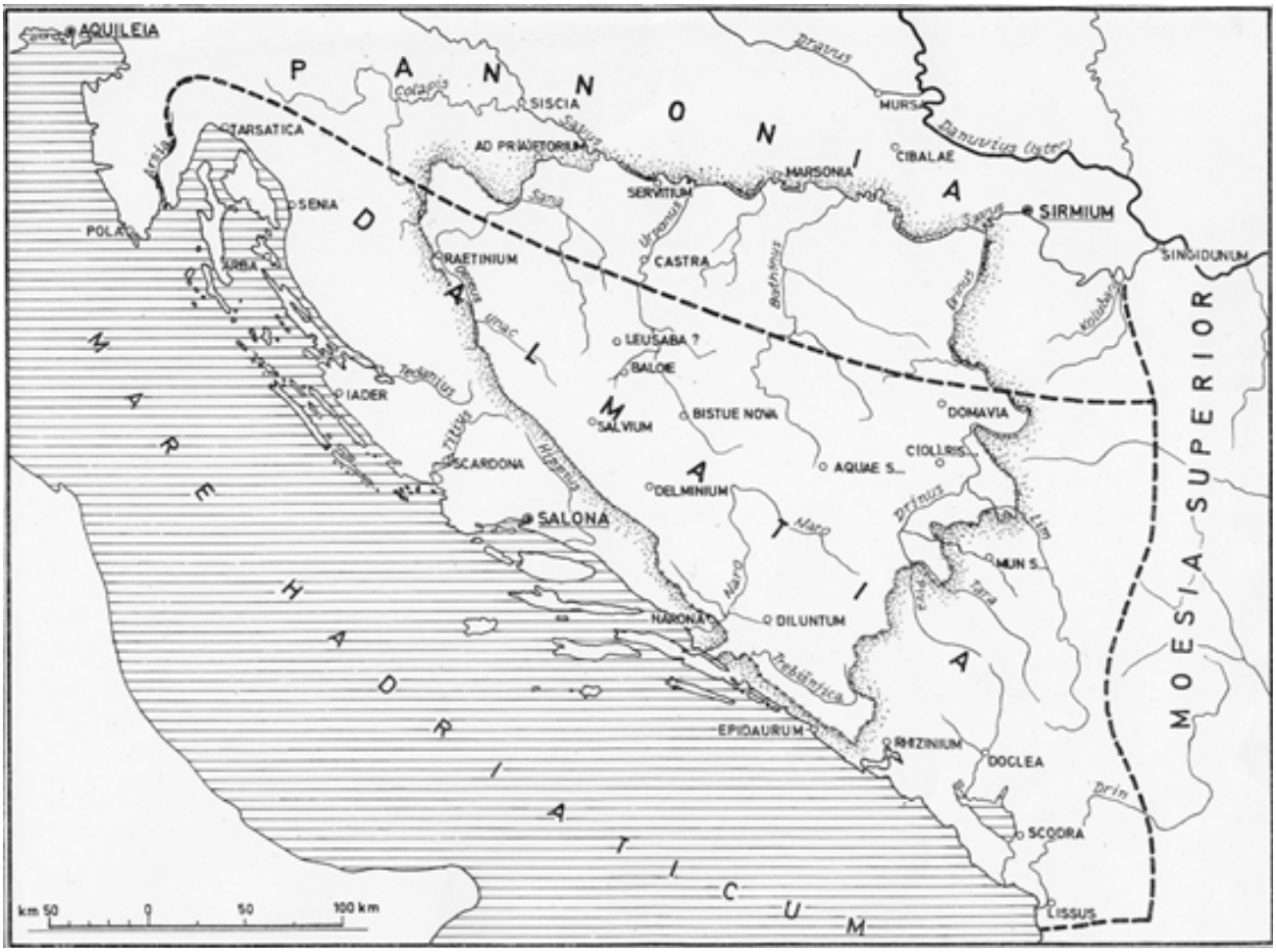
Slika 7. Rimska vila rustika Mogorjelo
Figure 7. Roman rustic villa Mogorjelo

Tuzle na Drinu (Babić, 2007.). Ne zna se precizno to razgraničenje, ali se svi povjesničari slažu da je granica bila južno od Save.

Intenzivniji uzgoj vinove loze u panonskom području počeo je tek nakon rimskih osvajanja. U vrijeme Rimljana bile su na tom području također vile rustike (Bojanovski, 1988.). Car Domicijan (51. – 96.) zabranio je širenje kvalitetnih sorata vinove loze u osvojenim ilirskim i panonskim prostorima kako bi onemogućio konkurenciju starim rimskim pokrajinama, iz čega se zaključuje da je na tim prostorima već bilo razvijeno vinogradarstvo (Babić, 2007.). No car Prob (276. – 282.) koji je inače bio podrijetlom iz Panonije, dopustio je intenzivniju proizvodnju u toj provinciji, nakon čega je proizvodnja grožđa u sjevernoj Bosni ponovo pošla uzlaznom linijom (Bojanovski, 1988.).

in Herzegovina. The Celts, who inhabited these areas before Roman conquests, were familiar with grapevine (Majnaric-Pandzic, 2003). Northern Bosnia, or the area north of Drinjaca, belonged to the province of Lower Pannonia (Bojanovski, 1988). Demarcation between Dalmatia and Pannonia followed the line from Bosanski Novi through Banja Luka and south of Tuzla to Drina (Babic, 2007). This demarcation is not precisely known, but all historians agree that the border was south of Sava.

A more intensive cultivation of grapevine in the Pannonian region began only after Roman conquests. In the time of the Romans, rustic villas were also present in this area (Bojanovski, 1988). Emperor Domitian (51 – 96) banned the spreading of high-quality grapevine varieties in the conquered Illyrian and Pannonian regions



Slika 8. Rimske provincije Dalmacija i Panonija (Bojanovski, 1988.)
Figure 8. Roman provinces Dalmatia and Panonia (Bojanovski, 1988)

Srednji vijek i osmansko razdoblje

Nakon dolaska Slavena na romanizirana područja Bosne i Hercegovine u 7. i 8. stoljeću nastavljen je kontinuitet vinogradarstva. Na brži poticaj uzgoja vinove loze i proizvodnje vina značajan doprinos imalo je svećenstvo nakon pokrštavanja slavenskih doseljenika. Samostani i vlastelinski dvorovi prije dolaska Turaka, kao i u ostalim dijelovima Europe, bili su središta vinogradarstva i vinarstva. Postoje brojni dokazi o prisutnosti vinogradarstva u srednjem vijeku u Humskoj zemlji, odnosno Hercegovini, ponajviše iz Dubrovačkih izvora. U tom se razdoblju vinogradarstvo vjerojatno proširilo iz Hercegovine u Bosnu: Foču, Goražde, Višegrad, Kladanj, Visoko, Zenicu i ostala mjesta u kojima je vinogradarstvo bilo razvijeno u predtursko doba.

Marko Vego (1937.) piše da su Dubrovčani u 9. i 10. stoljeću podizali vinograde u Travuniji i Zahumlju i plaćali za to naknadu, tzv. mogoriš.

in order to prevent competition to the ancient Roman provinces, which suggests that viticulture was already developed in these areas (Babic, 2007). But the Emperor Probus (276 – 282) who otherwise originated from Pannonia, allowed a more intensive production in that province, after which the production of grapes in northern Bosnia took an upturn again (Bojanovski, 1988).

The Middle Ages and the Ottoman period

After the Slavs arrived in the Romanized areas of Bosnia and Herzegovina in the 7th and 8th centuries, the continuity of viticulture was resumed. Clergy had a significant influence in encouraging a more rapid cultivation of grapevine and production of wine after baptizing the Slav settlers. Like in other European regions, monasteries and manor houses were centers of viticulture and winemaking before the arrival of the Turks. There is plenty of evidence of

Dubrovčani su u Hercegovini u vlasništvu imali vinograde i u vrijeme osmanske vlasti. U katastarskom popisu Hercegovine iz 1477. godine (Aličić, 1985.) spominje se Dubrovčanin Živan kojemu je kao naknada za njegovo imanje u Foči dan vinograd da ga uživa i plaća porez. U katastarskom popisu iz 1885. (Aličić, 2014.) godine u selu Tvrdoši kod Trebinja spominje se vinograd u vlasništvu dvojice Dubrovčana, koji ga uživaju i plaćaju porez.

Jireček (1984.) piše da je u srednjem vijeku na balkanskim prostorima vino bilo najotmjenije piće, a kod velike gospode, odnosno vlastele, držalo se u ledenici. Herceg Stjepan Kosača žali se na provale Turaka pa kaže:„ Gdje je prošao ovaj pas uništio je žita, vinograde, ostavio samo golu zemlju“ (Ćirković, 1964.). Vinogradarstvo i vino spominje se u nekoliko povelja iz toga doba, primjerice povelja kneza Miroslava krajem 12. stoljeća, Jurja Vojislavića iz 1434., a najvažnija je povelja mladoga bana, a kasnije najmoćnijega bosanskog kralja Tvrtka I. Kotromanića koju je 1353. godine izdao u mjestu Suha na području današnjega Čitluka. U tom mjestu ban i njegova pratnja bili su počašćeni hercegovačkim vinom. Ta se povelja i grb kralja Tvrtka I. danas koriste kao zaštitni znak hercegovačkih vina.

Kralj Stjepan Tomašević izdaje povelju kojom stricu Radivoju daje u posjed, između ostalog, u selu Buglini (danas selo Buljina kod Konjica) „6 kmeta s vinogradi“, što je bio prvi spomen vinove loze u tom najsjevernijem dijelu Hercegovine u kojemu uspijeva loza (Mulić, 2010.). Očito je da se već u rimsko vrijeme ili u ranom srednjem vijeku vinova loza širila na sjever dolinom rijeka. Na mnogim srednjovjekovnim stećcima širom Bosne i Hercegovine uklesani su motivi vinove loze, što pokazuje da je vinova loza bila važan dio gospodarskoga i društvenoga života srednjovjekovne Bosne i Humske zemlje.

Kada su Osmanlije u drugoj polovini 15. stoljeća zauzeli Bosnu i Hercegovinu zatekli su u njoj veoma razvijeno vinogradarstvo u svim područjima gdje su to klimatski uvjeti dopuštali. Dokazi za to nalaze se u popisima (defterima) koje su Osmanlije provodile u svim zemljama u kojima su uspostavljali svoju vlast. Prvenstveni cilj tih popisa bio je utvrđivanje posjeda carstva,

presence of viticulture in the Middle Ages in the land of Hum, or Herzegovina, mostly from the Dubrovnik sources. It is during this period, that viticulture probably spread from Herzegovina out to Bosnia - Foca, Gorazde, Visegrad, Kladanj, Visoko, Zenica and other towns where viticulture had been developed in the pre-Ottoman time.

Marko Vego (1937) writes that in the 9th and 10th centuries, inhabitants of Dubrovnik established vineyards in Travunija and Zahumlje and paid a fee for that, the so-called “mogoris“. Dubrovnikers owned vineyards in Herzegovina in the times of the Ottoman rule too. The 1477 cadastral register of Herzegovina (Alicic, 1975) refers to the man of Dubrovnik, Zivan, who was given a vineyard to use it and pay the tax, as a compensation for his property in Foca. The 1885 cadastral register (Alicic, 2014) mentions a vineyard owned by two men of Dubrovnik, who have the use of it and pay taxes, in the village of Tvrdosi near Trebinje.

Jirecek writes that wine was the most noble drink in the Balkans in the Middle Ages, and upper classes, or landed nobility, kept it in ice-cellars. Herceg Stjepan Kosaca complained about invasions of the Turks, and says, “Where this dog passed, it destroyed grains, vineyards, left only bare earth” (Cirkovic, 1964). Viticulture and wine are mentioned in several charters from that time, for example in the charter of Prince Miroslav in the late 12th century, Juraj Vojislavic in 1434, while the most significant is the charter of the young ban and later the most powerful Bosnian King Tvrtko the 1st Kotromanic, who issued it in the town of Suha in the area of present-day Citluk in 1353. In that town, the ban and his escort were offered Herzegovinian wine. That charter and King Tvrtko’s coat of arms are used even today as a trademark of Herzegovinian wines.

King Stjepan Tomasevic issued a charter vesting in uncle Radivoje, inter alia, the property of “6 serfs with vineyards,” in the village of Buglini (today the village of Buljina near Konjic), which was the first reference to grapevine in this northernmost part of Herzegovina in which grapevine is grown successfully (Mulic, 2010). It is obvious that grapevine was expanded to the north through river valleys as early as in Roman times or in the early Middle Ages. Motifs of grapevine were



Slika 9. Srednjovjekovni nadgrobni spomenik s motivom grožđa
Figure 9. Medieval tombstone with an engraved motif of grapes

prihoda određenih područja, te poreza i poreznih obveznika. Takve popise provodile su Osmanlije svakih 30 – 40 godina. Kao povijesni su izvori ti popisi veoma važni jer se iz njih može ocijeniti opseg proizvodnje pojedinih kultura i proizvoda, a za vinogradarstvo su važni jer pokazuju geografsko širenje vinove loze na području Bosne i Hercegovine.

Vinogradarstvom su se uglavnom bavili kršćani i oni su plaćali porez, odnosno desetinu na

carved in many medieval standing tombstones throughout Bosnia and Herzegovina, indicating that grapevine was an important part of economic and social life of the medieval Bosnia and the Hum country.

When the Ottomans occupied Bosnia and Herzegovina in the second half of the 15th century, they found a very developed viticulture in all areas where climate conditions allowed it. Evidence for that can be found in the registers (defters) that the

proizvodnju mošta. Muslimani koji su uzgajali vinovu lozu plaćali su porez na površinu vinograda, budući da oni nisu proizvodili vino već su konzumirali grožđe ili su ga prerađivali u neke druge proizvode. Prihod od poreza na vinograde bio je puno manji, nego onaj od poreza na mošt. Mjera za mošt bila je oka (1,281 l), medra (12,5 oka ili 16.04 l) i tovar (64 oke ili 82 l). Iz popisa se mogla utvrditi samo proizvedena količina grožđa, ali ne i površine pod vinogradima. Podaci o porezu na mošt dragocjen su podatak jer pokazuju geografsku rasprostranjenost vinove loze (Mulić, 2010.).

Prvi popis bio je Opširni popis Hercegovačkog sandžaka[1] rađen neposredno nakon okupacije, 1475. – 1477. Popis nije rađen po nahijama već po selima i vlasnicima tako da se često ne zna o kojem se području radi jer su nazivi mnogih sela kako su tada navedeni danas nepoznati. No po onome što je pouzdano utvrđeno očito je da je u to vrijeme vinova loza uzgajana u područjima gdje je već dugo nema. Takva su područja Nevesinje, Rudo, Rogatica, Čajniče, a Foča i Goražde bili su u to vrijeme izrazita vinogradarska područja. Budući da je taj popis rađen odmah nakon osmanlijskog zauzimanja Hercegovine, jasno je da je na tom području vinogradarstvo bilo razvijeno u vrijeme srednjovjekovne Bosanske države. Stotinu godina kasnije (1585. godine) izvršen je također popis Hercegovačkoga sandžaka i po tom popisu može se vidjeti kakav je trend u gajenju loze.

Prema katastarskom popisu iz 1585. godine može se zaključiti da u prvih 100 godina osmanske vlasti nisu bitno smanjene površine pod vinogradima. Od oko 90 sela evidentiranih u nahiji Foča, njih 54 plaćalo je porez na mošt, što znači da su proizvodili vino. Slično je bilo i u nahiji Goražde gdje je od 35 popisanih naselja porez na mošt plaćan u 33 sela. Osim toga bilo je još sela u kojima je uzgajana vinova loza, ali su vinogradi bili u vlasništvu muslimana koji nisu proizvodili mošt i vino. Danas u Foči i Goraždu

1 Područje današnje Bosne i Hercegovine je prvih 150 godina Turske vlasti bila podijeljena na četiri sandžaka: Bosanski sandžak obuhvaćao je središnji dio Bosne od Banje Luke do Višegrada i Novi Pazar. Hercegovački sandžak obuhvaćao je južni i jugoistočni dio Hercegovine, dio Crne Gore i dio Primorja. U Kliškom sandžaku, pored dijelova Dalmacije, bila su područja jugozapadne Bosne s Konjicom, Prozorom i Tomislavgradom, a Zvornički sandžak obuhvaćao je područja sjeveroistočne Bosne.

Ottomans implemented in all countries in which they were establishing their authority. Those registers were primarily aimed at determining properties of the empire, incomes of some areas, and taxes and taxpayers. The Ottomans conducted such registers every 30-40 years. These registers are very important as historical sources, as they help evaluate production volumes of certain crops and products, and they are important for viticulture because they show the geographical expansion of grapevine in the region of Bosnia and Herzegovina.

It is mainly the Christians and those who paid taxes, or tithes on the production of must, who pursued wine-growing. The Muslims who cultivated grapevine were paying taxes on the surface of vineyard, since they did not produce wine but consumed grapes or processed it into some other products. Revenues from the taxes on vineyards were much lower than from taxes on must. The measure for must was oka (1.281 L), medra (12.5 okas or 16.4 L) and tovar (64 okas, or 82 L). It is only quantities of grapes produced that could be established from the registers, not the areas of vineyards. The data of must taxes are valuable data because they show the geographic extent of grapevine (Mulic, 2010).

The first register was the Comprehensive Register of the Herzegovinian Sanjak[1] made immediately after the occupation, 1475 – 1477. The register was not made by nahiyes but by villages and owners so it is often not known what the concerned area was because names of many villages, as listed then, are unknown today. But from what has been reliably established, it is evident that at that time grapevine was cultivated in areas where it disappeared now long ago. Such areas were Nevesinje, Rudo, Rogatica, Cajnice, while Foca and Gorazde were prominent viticultural areas at that time. Since the register was made immediately after the Ottoman occupation of Herzegovina, it is evident that viticulture had been developed in this

1 In the first 150 years of the Turkish rule, the area of the present Bosnia and Herzegovina was divided into four sanjaks, the Bosnian Sanjak included the central part of Bosnia from Banja Luka to Visegrad and Novi Pazar. The Herzegovinian Sanjak covered the southern and southeastern part of Herzegovina, a part of Montenegro and a part of Primorje. In the Klis Sanjak, apart from parts of Dalmatia, were the areas of southwestern Bosnia with Konjic, Prozor and Tomislavgrad, while the Zvornik Sanjak included areas of northeastern Bosnia.

nema uopće tragova vinograda.

Mnoga područja u Bosni, naročito doline rijeka, bila su u srednjem vijeku zasađena vinovom lozom. Na to i danas podsjećaju brojni toponimi kao što su: Vinište, Vinograd, Vinac, Vinina, Vinovo brdo i drugi. Stanje vinogradarstva u Bosni veoma zorno prikazuje Opširni popis Bosanskoga sandžaka iz 1604. godine (Aličić, 200.). Na temelju podataka o naplaćenom porezu na proizvedeni mošt očito je da je vinogradarstvo u Bosni u 15. i 16. stoljeću bilo veoma dobro razvijeno. Cijelo srednje i donje Podrinje bilo je vinogradarsko područje. Vinograda je bilo najviše oko Višegrada, zatim oko Visokog, Breze, Kaknja, Zenice, dakle dolinom Bosne, ali i na području današnjega Olova i Kladnja. Primjerice u 10 sela nahije Kladanj plaćen je porez na mošt, što znači da je uzgajana loza. Jedino u Sarajevu i njegovoj bližoj okolici nije bilo uzgoja loze.

Da je na tom području uzgajana vinova loza, pokazuje izvješće Benedikta Kuripešića koji je kroz Bosnu prošao 1530. godine. Kuripešić piše: *Vidi se da je Bosna za vrijeme kršćana bila vrlo lijepa i dobro obrađena zemlja. Vinova loza rasla je na mnogo mjesta, a sada se sadi samo oko Višegrada i Novog Pazara. Govore da je ima prema moru i u pravcu prema Savi i Dunavu gdje su velike ravnice i zemlja dobro obrađena* (Kuripešić, 1950.). Kuripešić je putovao za Carigrad, a kroz Bosnu je prošao putem od Ključa preko Jajca, Donjega Vakufa, Sarajeva, Rogatice i Višegrada, što znači da je putovao uglavnom nevinogradarskim područjima.

Ne može se utvrditi je li vinova loza na ta područja došla s juga dolinom Trebišnjice preko Bileće, Foče i Goražda ili od sjevera dolinom rijeka Drine i Bosne. Naime na gotovo cijelom području sjeveroistočne Bosne bilo je u predtursko vrijeme razvijeno vinogradarstvo. Prema popisu iz 1548. godine u nahijama Gornje i Donje Tuzle gotovo da nije bilo naselja u kojem nije uzgajana loza. Na području te dvije nahije proizvedeno je u 1548. godini 9.570 tovara, ili oko 9.000 hl mošta (Handžić, 1975.). Cijela dolina rijeke Jale bila je u XVI. stoljeću isto toliko vinogradarska koliko i ratarska. No vinogradarstvo nakon toga naglo opada pa je 1600. godine proizvedeno svega 628 tovara ili gotovo 15 puta manje nego prije pola

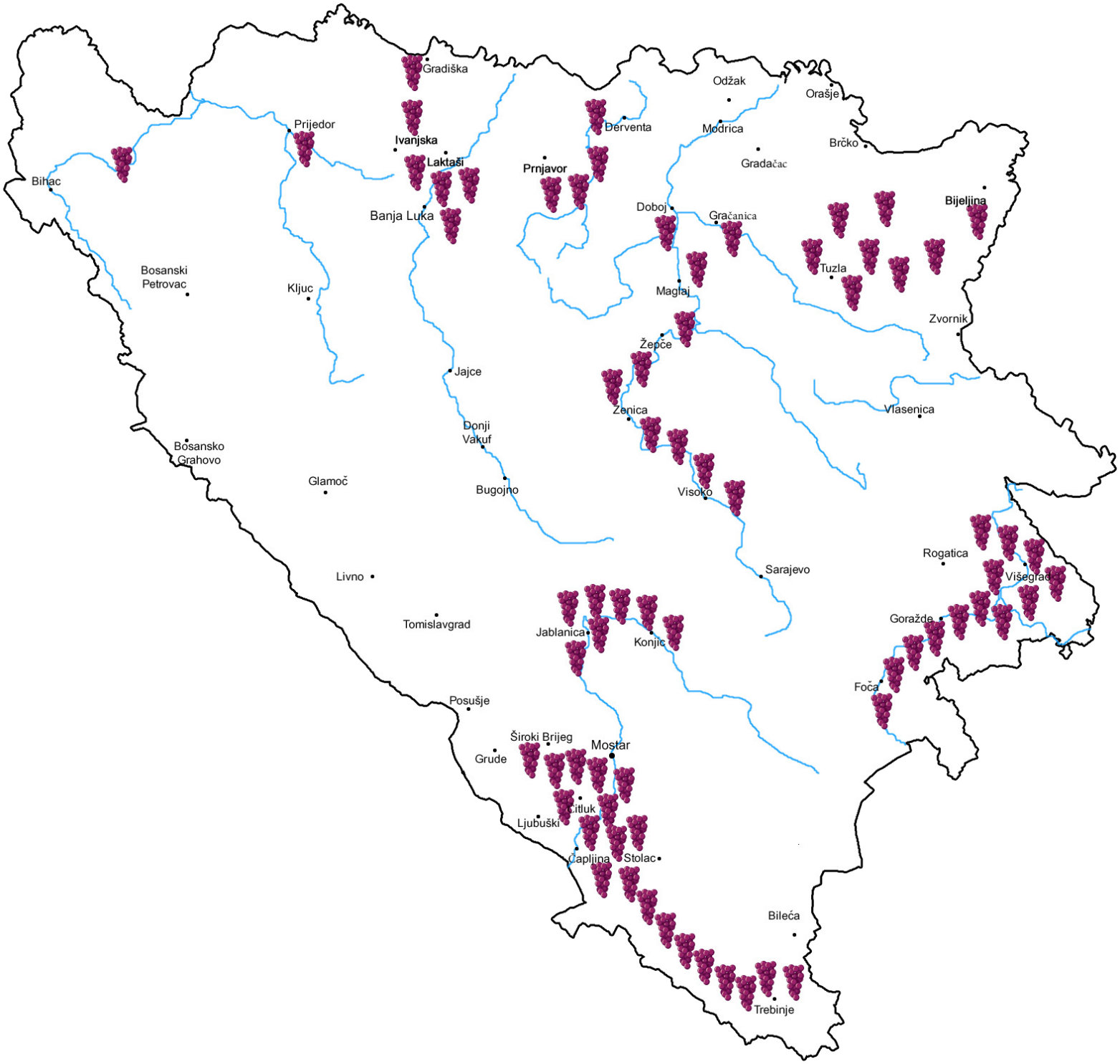
area during the medieval Bosnian state. Another register of the Herzegovinian Sanjak was made a hundred years later (in 1585) and in this register one can see trends in grape growing.

From the 1585 cadastral register, it can be concluded that vineyard areas were not significantly decreased in the first 100 years of the Ottoman rule. Of about 90 villages registered in the Foca nahiye, 54 were paying taxes on must, which means that they were producing wine. It was similar in the Gorazde nahiye, where tax on must was paid in 33 villages out of 35 registered settlements. Moreover, there were other villages in which grapevine was grown, but the vineyards were owned by the Muslims who did not produce must and wine. Nowadays, there have not been any traces of vineyards in Foca and Gorazde at all.

Many areas in Bosnia were planted with vines in the Middle Ages, especially river valleys. Today, numerous toponyms are reminiscent of that, such as Viniste, Vinograd, Vinac, Vinina, Vinovo hill and others. The Comprehensive Register of the Bosnian Sanjak from 1604 very realistically shows the state of viticulture in Bosnia(Alicic, 2000). Based on data on collected taxes on must produced, it is obvious that viticulture was very well developed in Bosnia in the 15th and 16th centuries. The entire middle and lower Drina River valley was a viticultural area. Most vineyards were around Visegrad, then around Visoko, Breza, Kakanj, Zenica, so in the Bosna River valley, but also in the area of present-day Olovo and Kladanj. For example, taxes on must were paid in 10 villages of the Kladanj Nahiye, which means that grapevine was grown. There was no cultivation of grapevines only in Sarajevo and its immediate vicinity.

The fact that grapevine was grown in that area is shown in a report by Benedikt Kuripesic who passed through Bosnia in 1530. Kuripesic writes: “It is evident that Bosnia was a very nice and well cultivated land in the time of the Christians. Grapevines grew in many places, and now they are planted only around Visegrad and Novi Pazar. People say that you can find them toward the sea and in the direction toward Sava and Danube, where there are great plains and land is well

Vinogradarska područja u Bosni i Hercegovini u 15. i 16. stoljeću[2]
Wine-growing areas in Bosnia and Herzegovina in the 15th and 16th centuries[2]



2 Karta je sačinjena na temelju turskih katastarskih popisa iz 1477. (Aličić, 1985.), 1548. (Handžić, 1975.), 1550. (Aličić i Spaho 2007.), 1585. (Aličić, 2014.) i 1604. (Aličić, 2000.).

2 The map was made on the basis of Turkish cadastral registers from 1477 (Alicic. 1985), 1548 (Handzic, 1975), 1550 (Alicic and Spaho 2007), 1585 (Alicic, 2014) and 1604 (Alicic, 2000).

stoljeća.

Banjalučko područje, odnosno donji tok rijeke Vrbasa bio je u srednjem vijeku i vrijeme Turske također vinogradarsko područje. Iako se ne može precizno utvrditi kolika je bila ta proizvodnja, iz Opširnog popisa Bosanskog sandžaka iz 1604. godine (Aličić, 2000.) i desetinskog poreza na proizvedeni mošt, očito je da je u dolini Vrbasa bila raširena proizvodnja vinove loze. Na svom putu kroz Banja Luku 1660. godine Evlija

cultivated" (Kuripesic, 1950). Kuripesic traveled to Constantinople, and went through Bosnia using the route from Kljuc via Jajce, Donji Vakuf, Sarajevo, Rogatica and Visegrad, which means that he traveled mainly through non-viticultural areas.

It cannot be established whether grapevine reached these areas from the south through the Trebisnjica valley over Bileca, Foca and Gorazde or from the north through the Drina and Bosna River valleys.



Slika 10. Magarac, nekada najvažnije „prijevozno" sredstvo
Figure 10. Donkey, once the most important „means of transportation"

Čelebija piše da se u Banjoj Luci plaća porez na 5.000 bašča i vinograda (Čelebija, 1996.). Uz pretpostavku da je prosječna površina pod vinogradom samo 0,2 ha, pa čak ako se uzme u obzir da je Čelebija ponekad znao i pretjerati u opisima, moglo je to iznositi više od 400 ha pod vinovom lozom. Vinova loza na banjalučkom području održala se sve do austrijske okupacije. Francuski general Anthouard, koji je Bosnu i Hercegovinu posjetio oko 1806. godine u svom izvješću navodi da su dva vinogradarska mjesta Banja Luka i Mostar (Jelavić, 1906.). Očito da je tada još postojao uzgoj vinove loze u nekim katoličkim selima oko Banje Luke.

Inače, Evlija Čelebija u svojim putopisima spominje uzgoj vinove loze i u drugim mjestima u Bosni u kojima danas više nama tragova vinograda. Opisujući Foču kaže *da su sve do obale Drine nanizane prostrane kuće, prizemne i na sprat. Zidane su od tvrdog materijala, a imaju i vinograde*. Za Nevesinjsko polje kaže da su *lijepe kuće oko kojih se nalaze vinogradi i bašče, živa vrela i prostrana dvorišta*. Selo Dabar je po Čelebiji napredni zaselak od petnaestak kamenim pločama pokrivenih kuća s vinogradima i baščama. Vinogradi u Nevesinju spominju se također u Sidžilu mostarskoga kadije iz 1634. godine, u kojemu se govori o dva vinograda založena radi duga (Mujić, 1975.). Čelebija je 1664. godine posjetio Semberiju u kojoj je također naišao na vinograde, ali za Bijeljinu kaže da im grožđe nije dobro.

Namely, grape growing was developed in almost the entire area of the northeastern Bosnia in pre-Ottoman times. According to 1548 register, there were hardly any villages in which grapevine was not grown in nahiyes of Upper and Lower Tuzla. In the areas of these two nahiyes, 9,570 tovars, or around 9,000 hL of must were produced in 1548 (Handzic, 1975). The entire valley of the Jala River was as much grape-growing as it was crop-farming in the 16th century. But viticulture thereafter suddenly decreases, so only 628 tovars, or nearly 15 times less than half a century ago, were produced in 1600.

The region of Banja Luka, or the lower course of the Vrbas River, was also a viticultural area in the Middle Ages and during the Turkey. Although it cannot be precisely established how big this production was, it is evident from the 1604 Comprehensive Register of the Bosnian Sanjak (Alicic, 2000) and tithe tax on the must produced, that production of grapevine was widespread in the Vrbas valley. On his way through Banja Luka in 1660, Evliya Celebi writes that tax was paid on 5,000 gardens and vineyards in Banja Luka (Celebi, 1996). Assuming that an average vineyard area was only 0.2 hectares, and even taking into account that Celebi sometimes tended to exaggerate in descriptions, that may have been over 400 hectares of grapevine. In the Banja Luka region, grapevine was maintained up until the Austrian occupation. The French general Anthouard, who visited Bosnia and Herzegovina



Slika 11. Loza i kamen
Figure 11. Vine and stone

Boue (1840.) piše da se vinova loza uzgaja u većini provincije Europske Turske, osim u velikom dijelu Bosne, gdje postoji samo mala količina na obalama Save, ali je ima mnogo više u Hrvatskoj nego u Bosni, misleći valjda također na obale Save. Klima nižih dijelova velikih dolina u Bosni nije nepogodna za tu kulturu, jer ima vinograda oko Broda, a još više u Slavoniji, ali stanovnici su navikli na rakiju šljivovicu i radije troše taj proizvod. Bere se osrednje kvalitetno bijelo i crveno grožđe na obalama Une u Dubici, Novom i Ostrošcu (na Uni) u Turskoj Hrvatskoj[3]. Prema popisu ili tzv. desetinskom defteru iz 1851. godine također se može zaključiti da je postojala stanovita proizvodnja grožđa u sjeverozapadnoj Bosni. Gustav Thoemel (1867.), koji je Bosnu i Hercegovinu posjetio 1864. piše da se u Bosni vinova loza uzgaja samo oko Ivanjske, sjeverozapadno od Banje Luke. Ivan Frano Jukić (1851.) također spominje da se oko Ivanjske uzgaja vinova loza. Tako se u Bosni na kraju turske vladavine vinova loza održala samu u Prozoru, Banjoj Luci i vrlo malo u dolini Une i oko Dervente.

Početak modernoga vinogradarstva

Dolazak Austro-Ugarske značio je prekretnicu u poljoprivrednoj proizvodnji Bosne i Hercegovine, kako u tehnološkom tako i organizacijskom pogledu. Austrija je u to vrijeme bila veoma uređena, pomalo birokratizirana i centralizirana država. U Bosni i Hercegovini vidjela je pogodno mjesto za proizvodnju kvalitetnoga vina, tim prije što je u ostalim vinorodnim dijelovima Monarhije filoksera već zaprijetila uništenjem vinograda. I dok u ostalim vinogradarskim dijelovima Austro-Ugarske Monarhije traje obnova vinograda uništenih filokserom, Monarhiji je bio cilj proizvesti što više kvalitetna vina na području Bosne i Hercegovine.

U tadašnji primitivni način proizvodnje uvodi suvremene mjere obrade, rezidbe, gnojidbe. Tada je uvedena praksa uzgoja loze uz koce, što do tada nije bio slučaj. Loza se do tada rezala kosijerom prilagođenim za te namjene, a austrougarska

around 1806, stated in his report that two grape-growing towns were Banja Luka and Mostar (Jelavic, 1906). It is evident that grape-growing still existed in some Catholic villages around Banja Luka.

Otherwise, in his travelogues Evliya Celebi mentions grape growing in other places in Bosnia in which today there are no traces of vineyards any more. Describing Foca, he says that "spacious houses, single-story and multi-story ones, are arranged in rows up to the Drina banks. They are made of solid materials, and have vineyards." For the Nevesinje field he says that "beautiful are houses around which there are vineyards and gardens, active springs and spacious yards." According to Celebi, the village of Dabar is a prosperous hamlet of some fifteen houses covered with stone plates with vineyards and gardens. Vineyards in Nevesinje are also mentioned in the court records of the Mostar qadi from 1634, which speak of two vineyards pledged for debt (Mujic, 1975). In 1664, Celebi visited Semberija where he also encountered vineyards, but for Bijeljina he said that their grapes were not good.

Boue (1840) writes that grapevine is grown in most provinces of the European Turkey, except in a large part of Bosnia, where there is only a small quantity on the banks of Sava, but there is much more of it in Croatia than in Bosnia, probably also having in mind the banks of Sava. The climate of lower parts of large valleys in Bosnia is not unsuitable for this crop, because there are vineyards around Brod, and even more in Slavonia; but the inhabitants are used to plum brandy and prefer consuming this product. Medium-quality white and red grapes are picked on the banks of Una in Dubica, Novi and Ostrozac (on Una) in Turkish Croatia[3]. According to the register, or the so-called „tithe defter" from 1851, it can be concluded that there was also a certain degree of grape production in northwestern Bosnia. Gustav Thoemel (1867), who visited Bosnia and Herzegovina in 1864, writes that grapevine is grown in Bosnia only around Ivanjska, northwest of Banja Luka. Ivan Frano Jukic (1851) too mentioned that grapevine

3 Tako se u vrijeme osmanske vladavine zvalo područje Bihaćke krajine, današnji Unsko-Sanski kanton. Svi putopisci koji su pisali o Bosni i Hercegovini u to vrijeme tako su nazivali ovo područje

3 All travel writers who have visited and written about Bosnia and Herzegovina during Ottoman rule have called Bihac area (today's Una-Sana Canton) by this name

vlast uvodi škare za rezanje. Donesena je također uredba da se na iskrčenom, prethodno neproduktivnom zemljištu na kojemu će se podići vinograd ne plaća porez sljedećih 10 godina. Stimulirana je prva nabava loznih kolaca, škara i ostalih materijala za uzgoj loze iz sredstava Zemaljske vlade. Usto organizira se meteorološka služba, a stručnjaci različitih profila iz ostalih dijelova Monarhije dolaze u Bosnu i Hercegovinu kako bi doprinijeli unapređenju poljoprivrede. Organiziraju se stručna predavanja za vinogradare u svim vinogradarskim područjima, a najbolji proizvođači su dobivali nagrade i priznanja.

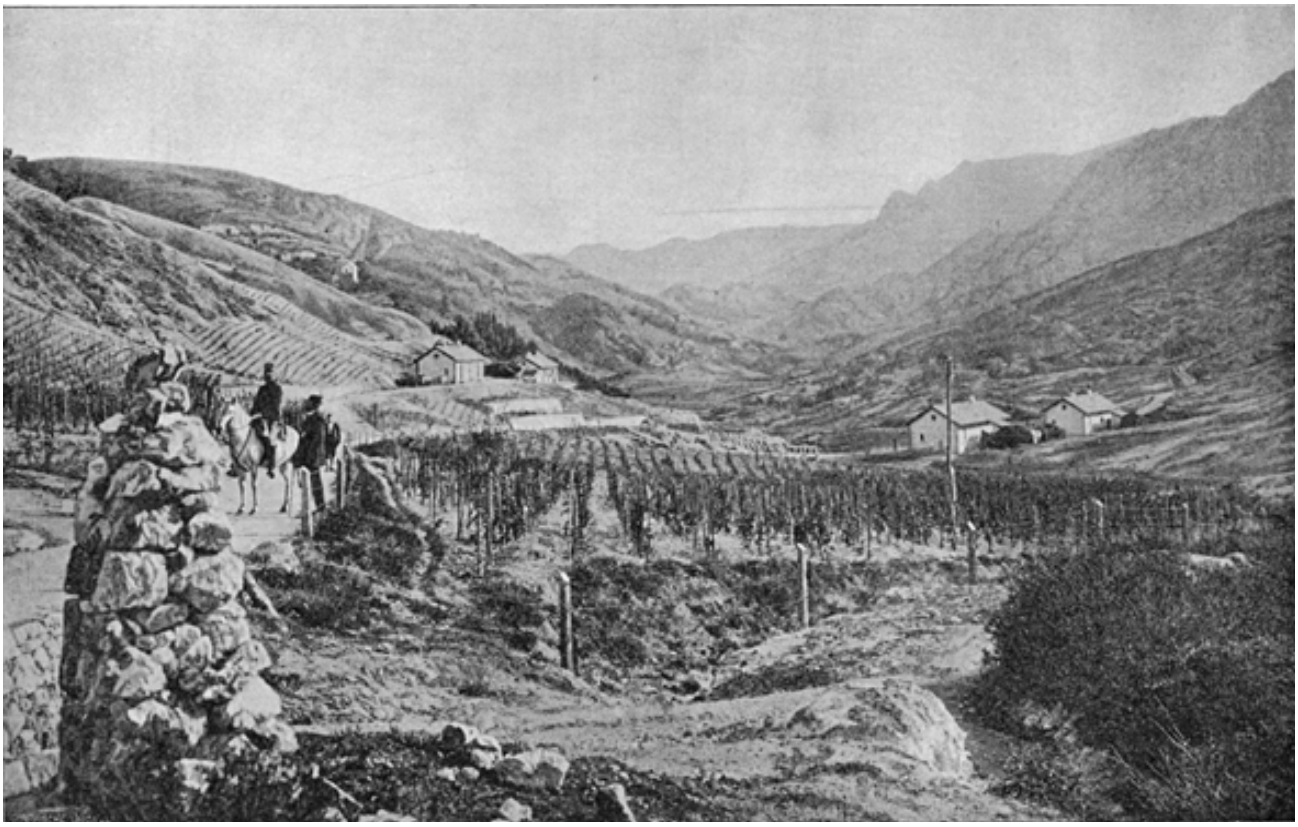
Odmah su osnovane voćarsko-vinogradarske zemaljske stanice u Gnojnicama kod Mostara, Lastvi kod Trebinja i Derventi (Landesregierung, 1899.). Stanice su osnovane i uređene kao uzorna dobra za unapređenje vinogradarstva i podrumarstva. Voćarsko-vinogradarska stanica u Mostaru osnovana je 1888. godine. Imala je površinu od 23,6 ha, od čega je na vinograd otpadalo 16,8 ha, te moderno uređen podrum kapaciteta 500 hl. Stanica u Lastvi kod Trebinja osnovana je 1894. i bila je namijenjena području jugozapadne Hercegovine, a posebno za područje

was grown around Ivanjska. Thus, in Bosnia at the end of the Turkish reign, grapevine was maintained only in Prozor, Banja Luka, and very little in the Una valley and around Derventa.

The beginning of modern viticulture

The arrival of Austria-Hungaria was a turning point in agricultural production of Bosnia and Herzegovina, both in technological and organizational terms. In that time, Austria was a very organized, somewhat bureaucratic and centralized state. Austria could see in Bosnia and Herzegovina a convenient place for production of high-quality wines, all the more so because phylloxera was already looming to devastate vineyards in other wine-growing areas of the Monarchy. And while renovation of vineyards destroyed by phylloxera was in progress in other wine-growing areas of the Austro-Hungarian Empire, Austria aimed to produce as much high quality wines as possible in the region of Bosnia and Herzegovina.

It introduced modern measures of treatment, pruning and fertilization in the then-primitive



Slika 12. Voćarsko-vinogradarska stanica u Lastvi kod Trebinja 1895. godine
Figure 12. Fruit and grape growing station in Lastva near Trebinje in 1895

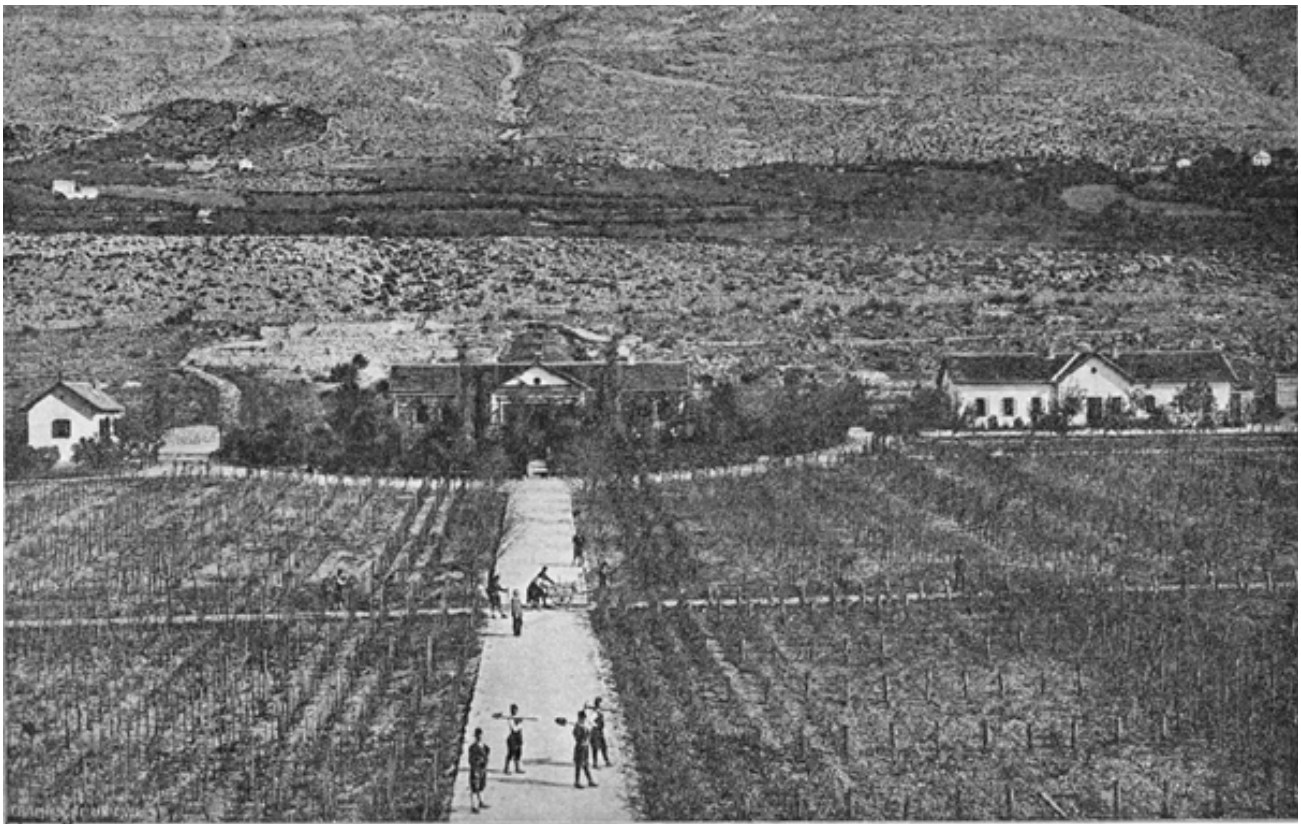
Popova polja. Ta je stanica imala površinu od 38,4 ha, od čega je na vinograde otpadalo 29,1 ha, a imala je podrum kao i stanica u Mostaru. Uz stanicu je radila dvogodišnja vinogradarska škola s praktičnom obukom. U stanicama u Mostaru i Lastvi zasađene su autohtone hercegovačke sorte i neke strane sorte.

U cilju revitalizacije vinogradarstva u sjevernoj Bosni 1888. osnovana je voćarsko-vinogradarska stanica u Derventi. Naime umjesto prilično velike proizvodnje u predosmansko vrijeme, prilikom austrijske okupacije zatečena je na cijelom području sjeverne Bosne proizvodnja grožđa manja od 100 tona. Budući da na tom području postoje odgovarajući uvjeti, Austro-Ugarska je namjeravala ponovo oživjeti vinogradarstvo. U sjevernu Bosnu naseljavana su domaćinstva iz Austrije ili iz nekih drugih dijelova Monarhije i oni su počeli saditi vinovu lozu. Takvih naselja bilo je oko Dervente, Broda i Bijeljine.

Voćarsko-vinogradarska stanica u Derventi ponajprije je trebala služiti za razvoj voćarstva, a potom vinogradarstva. Imala je ukupnu površinu od 63,3 ha od čega je na vinograde otpadalo 8,56

production methods. It is then that the practice of growing grapevines supported by poles was introduced, which had not been the case before. By then, vines had been cut with small pruning knives adjusted for that purpose, while the Austrian authorities introduced cutting scissors. They also issued a regulation that the tax was not to be paid in the following 10 years for a cleared, previously unproductive land, on which a vineyard would be established. The first purchase of vine poles, scissors and other materials for vine growing was stimulated from the funds of the National Government. On top of that, they organized a meteorological service, while experts of various profiles from other parts of the Empire came to Bosnia and Herzegovina to help improve agriculture. Professional courses for wine-growers were organized in all viticultural areas, and the best producers received awards and certificates.

National fruit and wine growing stations in Gnojnice near Mostar, Lastva near Trebinje and Derventa were established promptly (Landesregierung, 1899). The stations were set up and organized as exemplary farms for promotion



Slika 13. Voćarsko-vinogradarska stanica u Gnojnicama kod Mostara 1895. godine
Figure 13. Fruit and wine growing station in Gnojnice near Mostar in 1895

ha i 1,58 ha na rasadnik američke loze, a imala je i podrum s opremom kao u Mostaru i Lastvi. Vinograd je zasađen stolnim i vinskim sortama. Dok je u stanicama u Hercegovini naglasak na domaćim sortama, u Derventi su ispitivane poznate europske sorte Plavi Portugizac, Burgundac, Merlot od crnih, te Zeleni silvanac, Bijeli burgundac, Semillon, Sauvignon od bijelih, kao i neke stolne sorte. Američka loza je zasađena za slučaj pojave filoksere. Da bi se preduhitrile štete od filoksere, u voćarsko-vinogradarskoj stanici u Derventi zasađene su američke vrste *Vitis riparia portalis*, *Vitis solonis* i *Vitis rupestris*, s planom sadnje i nekoliko novih hibrida. Prva je odgovarala uvjetima tla u Bosni, a druge dvije za vapnenasta tla u Hercegovini. Vinograd u stanici u Derventi bio je uređen i dobro razvijen, a jedan trs iz toga vinograda bio je izložen na Milenijskoj izložbi u Budimpešti 1896. godine.

Zahvaljujući poduzetim mjerama i stimulacijama koje je nova vlast uvodila proizvodnja se ubrzano povećavala tako da je za 15 godina udvostručena. Proizvodnja je godine 1882. iznosila oko 4.100 tona, a godine 1892. 9.200 tona. No onda je početkom devedesetih godina 19. stoljeća i u Bosnu i Hercegovinu došla plamenjača. Napad plamenjače za samo nekoliko godina katastrofalno je smanjio proizvodnju, pa je 1897. godine iznosila svega 2.200 tona. Vlasti su tada donijele naredbu o obveznoj zaštiti vinove loze uz precizne upute kako provoditi zaštitu i olakšice u nabavi modre galice kao tada najučinkovitijega sredstva za zaštitu od plamenjače. Neprovođenje zaštite bilo je kažnjivo. Takve odlučne mjere urodile su plodom i proizvodnja je ponovo počela rasti. Sve do Prvoga svjetskog rata proizvodnja je bila u stalnom usponu, tako da je 1912. u Hercegovini bilo 6.040 hektara vinove loze, a proizvodnja vina iznosila je 12.000 tona. To je bilo četverostruko povećanje u odnosu na stanje iz turskoga vremena. Trebalo je proći devedeset godina da se dostigne tolika površina pod vinogradima.

U to vrijeme još je postojala proizvodnja vinove loze u sjevernoj Bosni, uglavnom na banjalučkom području i nešto manje oko Slavonskoga Broda, Dervente i Bijeljine. U Bosanskom glasniku za 1914. godinu piše da proizvodnja vina na području Banje Luke raste, te iznosi u gradskom području po prilici 800 hl godišnje. Među vinogradarima

of viticulture and winemaking. The fruit and grape growing station in Mostar was established in 1888. It had an area of 23.6 hectares, of which the vineyard accounted for 16.8 hectares, and a modern cellar with a capacity of 500 hl. The station in Lastva near Trebinje was established in 1894 and was intended for the area of southwestern Herzegovina, and especially for the area of Popovo Polje. This station had an area of 38.4 hectares, of which vineyards accounted for 29.1 hectares, and it had a cellar like the station in Mostar. A two-year wine-growing school with practical training operated next to the station. Autochthonous Herzegovinian varieties and some foreign varieties were planted in stations in Mostar and Lastva.

In order to revive viticulture in northern Bosnia, a fruit and wine growing station was established in Derventa in 1888. Namely, instead of a rather big production of pre-Ottoman times, production of grapes of less than 100 tons was found in the entire area of northern Bosnia upon the Austrian occupation. Since the conditions of the area were suitable, Austria-Hungary intended to revive viticulture. Families from Austria or from some other parts of the Empire were settled in northern Bosnia, and they began to plant grapevines. Such settlements could be found around Derventa, Brod and Bijeljina.

The fruit and wine growing station in Derventa was supposed to be used primarily for the development of fruit growing, and then wine growing. It had a total area of 63.3 hectares, of which vineyards accounted for 8.56 hectares and nursery of American vines 1.58 hectares, and it had a cellar with equipment like in Mostar and Lastva. The vineyard was planted with table and wine varieties. While stations in Herzegovina were focused on domestic varieties, the Derventa station tested renowned European varieties Blauer Portugieser, Burgundy, Merlot of the black varieties, and Green Silvaner, White Burgundy, Semillon, Sauvignon of the white varieties, as well as some table varieties. American vine was planted in case that phylloxera occurred. In order to prevent the damage from phylloxera, in fruit and wine growing station in Derventa American varieties Vitis riparia Portalis, Vitis solonis and Vitis rupestris were planted, with the planting

posebno se ističu talijanski naseljenici u selu Mahovljanima. U okolini Broda, Dervente i Bijeljine u to vrijeme bilo je više mjesta naseljenih doseljenicima iz Austrije ili drugih dijelova Monarhije koji su se bavili vinogradarstvom. Voćarsko-vinogradarska stanica u Derventi i lozni rasadnik u Bijeljini osnovani su upravo radi unapređenja vinogradarstva u sjevernoj Bosni. Međutim i pored svih nastojanja tadašnjih vlasti, vinogradarstvo se nije znatnije proširilo.

Propadanje i obnova vinograda

Filoksera je u Hercegovinu došla nešto kasnije nego u susjednu Dalmaciju gdje se pojavila 1888. Poučena iskustvom iz drugih europskih područja, austrijska je vlast 1888. godine donijela odluku o zabrani uvoza loznih sadnica u Hercegovinu iz susjednih država (Hrvatska i Srbija) gdje je zaraza već postojala. Koliko je ta uredba bila korisna i koliko je usporila dolazak filoksere u Hercegovinu vidi se po tome što su vinogradi u Hercegovini za dugo vremena ostali zdravi i bez filoksere. Međutim kako se ta odluka nije odnosila na Bosnu filoksera je tamo došla znatno ranije nego u Hercegovinu. U njemačkoj naseobini Božincima kod Dervente filoksera je otkrivena 1904. Tu je, pretpostavlja se, donesena s reznicama iz Austrije. Da bi što više smanjila mogućnost zaraze, Zemaljska vlada u Sarajevu je 1908. donijela uredbu kojom se zabranjuje prenošenje loze iz jednoga hercegovačkog vinogradarskog područja u drugo.

No vlast i stručnjaci bili su svjesni da će filoksera uskoro doći i u to područje. Da bi preduhitrili katastrofu koja je pogodila većinu vinogradarskih područja u Europi, započeli su tih godina pokuse s američkim divljim vrstama, uglavnom *V. riparia, V. rupestris i V. berlandieri* i njihovim hibridima, a 1912. u Ljubuškom je osnovan lozni rasadnik za proizvodnju podloga. Za taj lozni rasadnik, ili ložnjak kako su ga tada zvali, doneseno je 14.000 reznica američkih podloga iz rasadnika u Čibači kod Dubrovnika, gdje još nije bilo zaraze od filoksere. Kad se filoksera pojavila u Hercegovini, te podloge poslužile su za cijepljenje plemenitih sorata prilikom prve obnove vinograda. Zahvaljujući loznom rasadniku u Ljubuškom bilo je dovoljno sadnoga materijala za cijepljenje, a

schedule and several new hybrids. The first was suitable for soil conditions in Bosnia, and the other two for calcareous soils in Herzegovina. The vineyard in the station of Derventa was organized and well-grown, and one vine from that vineyard was exhibited at the Millennium Exhibition in Budapest in 1896.

Thanks to the measures and incentives that the new authorities introduced, production was rapidly increasing so it doubled in 15 years. In 1882, the production was about 4,100 t, and in 1892 it was 9,200 tons. But then came downy mildew to Bosnia and Herzegovina in the early 1890s. In only a few years, the attack of downy mildew catastrophically decreased the production, and so it came to mere 2,200 tons in 1897. Then the authorities issued an order on compulsory protection of vines, with precise instructions on how to conduct the protection and rebates in purchase of blue vitriol as the most cost-effective means for protection against downy mildew at that time. Failure to apply the protection was punishable. Such resolute measures bore fruit and the production started to grow again. Until the First World War, production was steadily rising, so that in 1912 there were 6,040 hectares of vines in Herzegovina, while wine production amounted to 12,000 tons. That was a four-fold increase in relation to the situation in the time of Turkey. It took ninety years to reach that size of vineyards.

At that time, there was still production of grapevine in northern Bosnia, mainly in the Banja Luka area, and slightly less around Slavonski Brod, Derventa and Bijeljina. In was written in the 1914 Bosnian Gazette that production of wine in the Banja Luka area was growing, and it amounted to approximately 800 hl per year in the town area. Among the wine growers, Italian settlers in the village Mahovljani particularly stood out. In the vicinity of Brod, Derventa and Bijeljina at that time there were many places inhabited by settlers from Austria or other parts of the Empire who were occupied with viticulture. It is for improving viticulture in northern Bosnia that fruit and wine growing station in Derventa and vine nursery in Bijeljina were established. However, in spite of all the efforts of the then authorities, viticulture did not significantly expand.

stručnjaci su vinogradarima objašnjavali nužnost cijepljenja (navrćanja) kao i tehniku izvođenja. Organizirani su tečajevi na kojima se neke vinogradare obučavalo u toj tehnici. Istodobno je za područje sjeverne Bosne osnovan lozni rasadnik u Bijeljini koji je trebao poslužiti za obnovu vinograda u tom području.

Kao rezultat zabrane prometa sadnim materijalom i zatvorenosti granice, filoksera je u Hercegovinu došla znatno kasnije nego u Dalmaciju. Prva zaraza filokserom utvrđena je u selu Vinjanima, oko tri kilometra od granice s Dalmacijom. Zaključak je stručnjaka bio da je zaraza stara već više godina pa je moguće da je prešla u ostala pogranična sela Hercegovine. Ta pretpostavka pokazala se ispravnom jer je prva pojava filoksere zabilježena 1913. u rubnim selima prema Dalmaciji, u Gorici i Sovićima. Pretpostavlja se da je već 1914. veliki broj vinograda u Hercegovini bio zaražen. No u Dračevicama kod Mostara već 1912. zapaženi su simptomi na lozi koji podsjećaju na zaraženost filokserom. Pretpostavka je bila da su je tu na motikama donijeli težaci koji su iz Dalmacije dolazili kopati lozu. Budući da se filoksera pojavila uoči rata, u ratnom razdoblju nije bila moguća normalna obnova vinograda. Tijekom Prvoga svjetskog rata vinogradi su toliko uništeni da je do završetka rata predratna proizvodnja bila prepolovljena.

Obnova vinograda mogla je započeti tek nakon rata, dakle 5 – 6 godina nakon prve pojave filoksere. To je prilično dugo razdoblje tako da je filoksera u međuvremenu zahvatila velike površine pod vinogradima. Najviše je uništila vinograde ljubuškoga, mostarskoga i stolačkoga kotara. Zaraza se očito kretala u smjeru: Ljubuški, Čapljina, Mostar, Stolac. Do 1926. u ljubuškom kotaru uništeno 90 % vinograda, u mostarskom 70 % i stolačkom 80 %. U Trebinje je došla nešto kasnije, a najkasnije u Konjičko područje koje je u to vrijeme još uvijek imalo značajne površine pod vinogradima. Po izvješću Mate Lovrenovića, tajnika Saveza hrvatskih seljačkih zadruga iz Sarajeva, u 1926. godini u Hercegovini bilo je 2.825 ha stare loze i samo oko 350 ha nove loze cijepljene na američke podloge. Iz toga pregleda vidi se kakve je štete nanijela filoksera upravo u najvinorodnijim kotarima, Mostaru i Ljubuškom. U mostarskom kotaru je 1926. godine bilo 40 %

Degradation and renovation of vineyards

Phylloxera came to Herzegovina slightly later than in the neighboring Dalmatia, where it appeared in 1888. Having learnt from experiences of other European regions, in 1888 the Austrian government made the decision to ban imports of vine seedlings to Herzegovina from neighboring countries (Croatia and Serbia), where the infection was already present. How much this regulation was useful and how much it slowed down the arrival of phylloxera to Herzegovina is evident from the fact that vineyards in Herzegovina remained healthy and free of phylloxera for a long time. However, as the decision did not apply to Bosnia, phylloxera came there much earlier than to Herzegovina. Phylloxera was discovered in the German settlement of Bozinci near Derventa in 1904. It is assumed that it was brought there with cuttings from Austria. In order to minimize the possibility of infection, in 1908 the National Government in Sarajevo issued a regulation banning the transfer of vines from one Herzegovinian viticultural area to another.

However, authorities and experts were aware that phylloxera would come to this area soon too. To prevent the disaster that had struck most of the wine-growing regions in Europe, in those years they began testing the American wild varieties, mainly *V. riparia, V.rupestris and V. berlandieri* and their hybrids, and in 1912 a grapevine nursery for production of rootstocks was established in Ljubuski. For that vine nursery, or loznjak as it was called then, 14,000 cuttings of American rootstocks were brought from the nursery of Cibaca near Dubrovnik, where there was no infestation of phylloxera yet. When phylloxera appeared in Herzegovina, these rootstocks were used to graft noble varieties during the first renewal of vineyards. Thanks to the vine nursery in Ljubuski, there was enough planting material for grafting, and experts were explaining to wine-growers the necessity of grafting (navrcanje) as well as grafting techniques. They organized courses in which some wine-makers were trained in that technique. At the same time, grapevine nursery for the area of northern Bosnia was established in Bijeljina, which was intended to be used for renewal of vineyards in that area.
As a result of the ban on circulation of planting

predratnih površina, a u ljubuškom kotaru samo 24 %. Kaže se da obnova vinograda najbolje ide u mostarskom i ljubuškom kotaru, nešto slabije u stolačkom, trebinjskom i ljubinjskom, a u konjičkom nema obnovi ni traga iako je filoksera i tamo načela vinograde (Lovrenović, 1928.).

Prva obnova vinograda započela je između 1920. i 1922. Pri obnovi vinograda i kalemljenju na američku podlogu korištena su iskustva susjedne Dalmacije. Klimatske, terenske i zemljišne prilike u Hercegovini i Dalmaciji su slične. U Dalmaciju je filoksera došla znatno ranije i u njoj je obnova bila pri kraju kad je u Hercegovini počela. Podloge za cijepljenje dobivene su iz rasadnika u Ljubuškom. Međutim to nije bilo dovoljno pa su osnivani lokalni rasadnici u središtima užih vinogradarskih područja poput: Čitluka, Mostara, Stoca, Lastve kod Trebinja, Žitomislića. Vinogradari su uglavnom prihvaćali sadnju američkih podloga i cijepljenje domaćih sorata na nju, ali je obnova išla dosta sporo.

Krajem dvadesetih i početkom tridesetih godina dvadesetoga stoljeća obnova je krenula znatno brže tako da do polovine tridesetih godina gotovo da više nije bilo starih vinograda osim u konjičkom području. No tada dolazi opća gospodarska kriza, a napose kriza s izvozom i prodajom vina. To je utjecalo na usporavanje obnove vinogradarstva,

material and closed border, phylloxera came to Herzegovina much later than to Dalmatia. The first phylloxera infection was found in the village of Vinjani, about three kilometers far from the border with Dalmatia. The conclusion of experts was that the infection had already been several years old, so it was likely to have moved to other border villages of Herzegovina. This assumption proved to be correct because the first occurrence of phylloxera was registered in 1913 in the border villages toward Dalmatia, Gorica and Sovici. It is assumed that in 1914 a large number of vineyards in Herzegovina was already infected. But symptoms on vines that resemble the phylloxera infection were detected in Dračevice near Mostar already in 1912. The assumption was that it was brought there on hoes by laborers who came from Dalmatia to till vines. Since phylloxera appeared on the eve of the war, normal renewal of vineyards was not possible during the war period. During the First World War, vineyards were ruined so much that the pre-war production was halved by the end of the war.

Restoration of vineyards could start only after the war, so five or six years after the first appearance of phylloxera. That was quite a long period of time so that in the meantime phylloxera had spread out to large areas of vineyards. It devastated the most vineyards of Ljubuški, Mostar and Stolac

Tablica 2. Površine pod vinogradima u Hercegovini u ha (Kuri, 1955., Vuksanović i sur., 1977.)
Table 2. Areas of vineyards in Herzegovina in ha (Kuri, 1955, Vuksanović et al., 1977)

Kotar/općina Municipality	**1912.**	**1922.**	**1940.**	**1945.**	**1954.**	**1975.**
Mostar	2.654	1.458	1.222	1.356	1.404	1.020
Čitluk*						1.071
Ljubuški	708	354	603	602	672	740
Čapljina	539	323	308	304	498	944
Stolac	516	310	289	292	448	588
Trebinje	418	293	270	127	162	305
Široki Brijeg	210	92	136	124	146	190
Grude/Posušje	149	74			145	161
Konjic	662	641	517	230	48	68
Prozor	184	162	131	16	9	14
Ukupno / Total	6.040	3.707	3.476	3.210	3.492	5.101

*Čitluk je tek 1955. postao općinsko mjesto – Citluk became a municipality in 1955

tako da je pred drugi svjetski rat Hercegovina dočekala sa svega 3.476 ha pod vinogradima. Tada dolazi rat i novo propadanje vinograda. Na završetku je Drugoga svjetskog rata u Hercegovini bilo 3.021 ha. Dakle dvostruko manje nego pred Prvi svjetski rat.

Nakon Drugoga svjetskog rata počinje druga obnova vinograda. Tada počinje sustavno povećanje površina pod vinogradima, ali isto tako i unapređenje tehnike proizvodnje pa se povećavaju i prinosi.

Suvremeno vinogradarstvo

Pedesetih godina prošloga stoljeća započela je nova era u vinogradarstvu Hercegovine koja traje do danas. Tada započinje moderno vinogradarstvo temeljeno na plantažnoj proizvodnji i to najprije kao zadružni vinogradi. Bilo je to vrijeme socijalističkoga sustava proizvodnje, formiranje velikih društvenih, zapravo državnih gospodarstava i ubrzano ulaganje u poljoprivredu. Budući da je površina privatnoga posjeda bila ograničena na 10 hektara, privatnici nisu mogli imati plantaže, a nekoliko je velikih podruma nacionalizirano i nastavilo rad kao državni podrumi. Da bi se povećale površine pod vinovom lozom i unaprijedilo prilično zapušteno vinogradarstvo, počelo se na državnim gospodarstvima saditi vinovu lozu. U podizanju plantaža i uzgoju loze primijenjena je suvremena tehnologija, razmak sadnje prilagođen je primjeni mehanizacije u obradi tla i zaštiti od bolesti i štetnika, a odgovarajućom rezidbom i gnojidbom značajno su povećani prinosi. Ti su vinogradi i primijenjena tehnika proizvodnje postali model za privatno vinogradarstvo. Od šezdesetih godina svi privatni vinogradi također su podizani i vođeni po uzoru na državne plantaže.

Veliko značenje u zaštiti vinove loze od plamenjače (*Plasmopara viticola*) i obuci vinogradara u pravilnoj primjeni sredstava za zaštitu i pravodobnom provođenju zaštite imalo je osnivanje antiperonosporne službe. Za takvom službom odavno se ukazivala potreba kako bi se protiv te opasne bolesti uspostavio jedinstven sustav zaštite za cijelu Hercegovinu. Prva antiperonosporna stanica u Hercegovini osnovana je u Loznom rasadniku u Ljubuškom 1937.

districts. The infection was obviously following the path Ljubuski, Capljina, Mostar, Stolac. By 1926, 90% vineyards were destroyed in the Ljubuški district, 70% in Mostar and 80% in Stolac districts. It came later to Trebinje, and latest to the area of Konjic, which at that time still had significant areas of vineyards. According to a report of Mate Lovrenovic, Secretary of the Union of Croatian Farming Cooperatives in Sarajevo, there were 2,825 hectares of old vines and only about 350 hectares of vines grafted onto American rootstock in Herzegovina in 1926. That review shows what kind of damage was caused by phylloxera in the very highest-production districts, Mostar and Ljubuski. In 1926, there were 40% of pre-war areas in the Mostar district, and only 24% in the Ljubuski district. It was said that the renewal of vineyards was going best in the Mostar and Ljubuški districts, slightly less in the Stolac, Trebinje and Ljubinje districts, and in the Konjic district there was no sign of renewal, although phylloxera damaged vineyards there too (Lovrenović, 1928).

The first renewal of vineyards started between 1920 and 1922. Experiences of neighboring Dalmatia were used in renewal of vineyards and grafting on American rootstocks. The climate, terrain and soil conditions in Herzegovina and Dalmatia are similar. Phylloxera came to Dalmatia much earlier, and the renewal was nearly finished there when it started in Herzegovina. Grafting rootstocks were obtained from the nursery in Ljubuski. However, that was not enough, so local nurseries were established in centers of narrower wine-growing areas, such as Citluk, Mostar, Stolac, Lastva near Trebinje, Zitomislic. Winegrowers mainly accepted planting of American rootstocks and grafting of domestic varieties on it, but the renewal was going quite slowly.

In the late 1920s and early 1930s, the renewal started taking a significantly more rapid pace, so by mid-1930s there were almost no more old vineyards except in the area of Konjic. But then came the general economic crisis, and especially the crisis with export and sales of wine. That caused a slowdown in the renewal of viticulture, so Herzegovina had only 3,476 hectares of vineyards on the eve of the second World War. Then came the war and a new degradation of

godine, a bila je pod patronatom Poljoprivredne kontrolne stanice u Splitu (Blagojević, 1955.). No prava antiperonosporna služba u Hercegovini uspostavljena je tek 1951. sa sjedištem u Mostaru, uz nekoliko stanica u vinogradarskim lokalitetima širom Hercegovine. Na tim stanicama uspostavljen je sustav praćenja meteoroloških podataka bitnih za pojavu plamenjače i na temelju tih podataka preporučane su mjere zaštite.

Poseban zamah vinogradarstvu Hercegovine, napose u državnom vlasništvu, bilo je osnivanje HEPOK-a, velike državne kompanije, 1966. godine. HEPOK je bio korporacija u koju je bila udružena proizvodnja i prerada grožđa, promet grožđem, vinom i repromaterijalima, te stručne i znanstvene službe. Valja reći da su i privatnici koristili usluge hepokovih stručnih i znanstvenih službi. Kao rezultat velikih ulaganja, te dobre i stručne organizacije ubrzano se povećavao broj plantažnih vinograda. U najboljim vremenima krajem osamdesetih godina u sastavu HEPOK-a bilo više od 2.000 ha vinograda od Mostara do Trebinja, kako vinskih tako i stolnih sorata. Ukupne se površine pod vinogradima u Hercegovini također povećavaju. S poratnih 3.210 ha do 1954. vinogradarstvo se proširilo na oko 3.500 ha, godine 1975. iznosilo je 5.100 ha,

vineyards. At the end of the Second World War, there were 3,021 hectares in Herzegovina. So, half as much as before the First World War.

The second renewal of vineyards started after the Second World War. That is when a systematic increase in vineyard areas began, but production techniques were also improved and yields increased as a result.

Modern viticulture

A new era in viticulture of Herzegovina began in 1950s and has continued until today. That is when the new viticulture was begun, founded on plantation production, and it was first begun as cooperative vineyards. That was the time of the socialist production system, formation of large community farms, in fact state farms, and rapid investments in agriculture. Since the area of private property was limited to 10 hectares, private persons were not allowed to have plantations, while several large cellars were nationalized and continued to work as state cellars. To increase areas under vines and improve the rather neglected viticulture, planting of vines was begun in state farms. Modern technology was applied in establishment of plantations and cultivation



Slika 14. Moderni plantažni vinograd
Figure 14. Modern plantation vineyard

a krajem 1980-tih vinogradarstvo se proširilo na nešto manje od 6.000 ha.

Ratna djelovanja u Bosni i Hercegovini devedesetih godina ponovo su dovela do stagniranja vinogradarstva u Hercegovini. Budući da je sa scene nestao i dotadašnji komunistički sustav društvenoga uređenja, nekadašnji plantažni vinogradi u sastavu HEPOK-a prešli su iz državnog vlasništva u privatne ruke. Neki od njih su propali, ali je većina i dalje u funkciji kao visoko produktivni objekti. Na nekim od bivših površina društvenoga sektora također se podižu novi privatni plantažni vinogradi. Tehnologija uzgoja kakva je prakticirana u bivšim HEPOK-ovim plantažnim vinogradima uvedena je danas praktično u sve vinograde u Hercegovini. Gotovo da nema više vinograda bez armature, a mehanizacija je u potpunosti zamijenila tradicionalni način proizvodnje.

Kako Hercegovina oskudijeva s obradivim površinama vinogradi su podizani na „djevičanskim“ zemljištima koja su dotada bila pod šumom ili su bila neplodna krševita zemljišta. Takva praksa počela se provoditi početkom pedesetih godina kada su podizani zadružni vinogradi na iskrčenom šumskom zemljištu ili kamenjaru. Kasnije je uz primjenu moćne mehanizacije nastavljeno podizanje vinograda na dotad nekorištenom zemljištu, tako da neplodno postaje plodno. Najbolji primjer takva vinogradarstva je vinograd u Blizancima (slika 15.) koji je podignut nakon privođenja kulturi izrazito kršnog terena.

Posljednjih godina svjedoci smo sve učestalijega privođenja kulturi manje plodnih, odnosno neplodnih površina na kršu. No dok su to ranije radile državne firme sada to rade privatnici. Takvim privođenjem krša kulturi stvaraju se velike parcele kakvih je inače veoma malo u usitnjenim privatnim posjedima Hercegovine. Osim bivših društvenih parcela, u Hercegovini je teško naći parcelu s površinom većom od 0,5 ha. Uglavnom su između 0,2 do 0,3 ha, što pokazuju najnoviji ortofoto snimci. Primjerice samo na području općine Čitluk evidentirano je oko 3.400 parcela pod vinogradima ukupne površine oko 500 ha (bez vinograda vinarije *Čitluk*), a prosječna površina parcele je 0,15 ha. To su površine na kojima se teško može ostvariti profitabilna

of vines, planting distance was adjusted to application of machinery in soil cultivation and protection from diseases and pests, and appropriate pruning and fertilization significantly increased yields. These vineyards and applied production techniques became a model for private vineyards. From the sixties, all private vineyards too were established and managed on the pattern of state plantations.

Establishment of the anti-peronospora service had a great significance in protection of vines from downy mildew (*Plasmopara viticola*) and training of wine-growers in proper application of protection agents and timely implementation of protection. The need for such a service had appeared long ago in order to establish a unified system of protection against this dangerous disease for the entire Herzegovina. The first anti-peronospora station in Herzegovina was established in the vine nursery in Ljubuski in 1937, godine, and was under patronage of the Agricultural Monitoring Station in Split (Blagojevic, 1955). But the proper antiperonospora service in Herzegovina was established only in 1951 with head office in Mostar, along with several stations in wine-growing sites throughout Herzegovina. A system for monitoring meteorological data relevant to occurrence of downy mildew was established at these stations, and protection measures were recommended based on these data.

A special impetus to viticulture of Herzegovina, especially state-owned viticulture, was the establishment of HEPOK, a large state company, in 1966. Hepok was a corporation that combined production and processing of grapes, trade of grapes, wine and production materials, and professional and scientific services. It is noteworthy that private persons also used Hepok’s professional and scientific services. As a result of large investments, as well as good and professional organization, the number of plantation vineyards was rapidly growing. In its prime at the end of the eighties, Hepok consisted of more than 2,000 hectares of vineyards, from Mostar to Trebinje, of wine as well as table varieties. Total areas of vineyards in Herzegovina were also increasing. From the postwar 3,210, by 1954 viticulture spread to about 3,500 ha, in 1975 it amounted to 5,100 ha, and in late 1980s viticulture spread to



Slika 15. „Kameni“ vinograd Blizanci
Figure 15. „Kameni“ (stone) vineyard in Blizanci

proizvodnja uz primjenu suvremene agrotehnike. Veće površine omogućuju primjenu mehanizacije, navodnjavanja i drugih agrotehničkih mjera. Takvih potencijalnih površina za uzgoj vinove loze ima mnogo u državnom vlasništvu, ali su za njihovo kultiviranje potrebna velika ulaganja. Već postoje brojni primjeri podizanja vinograda na dotad neplodnom i krševitom zemljištu na području više lokaliteta mostarskoga vinogorja, najviše oko Ljubuškog, Čitluka i Stoca.

Osim osvajanja novih površina, Hercegovci poboljšavaju i uvjete proizvodnje. Česte su godine u Hercegovini kada zbog suše prinosi podbace. Da bi to spriječili, vinogradari uvode u vinograde

almost 6,000 ha.

War activities in Bosnia and Herzegovina in nineties again led to stagnation of viticulture in Herzegovina. As the former communist system of social organization also disappeared from the scene, former plantation vineyards within Hepok were transfered from state ownership to private hands. Some of them failed, but most are still in the function as highly productive facilities. New private plantation vineyards are also established in some of the former areas of the social sector. The technology of cultivation as it was practiced in former Hepok plantation vineyards has been introduced today in virtually all vineyards in

sustave za natapanje po sustavu kap-po-kap. Kako na većem dijelu vinogradarskih površina nema tekućih voda, vinogradari buše bunare da bi došli do podzemnih izvora. Nije rijetkost da se buši i dublje od 200 m da bi se došlo do vode. Iz podzemnih bunara voda se crpi i razvodi po vinogradima. Na taj način, primjenom suvremene tehnologije u svim fazama proizvodnje, hercegovački vinogradari ostvaruju dobre prinose, održavaju kakvoću renomiranih sorata, te povećavajući produktivnost u proizvodnji osiguravaju budućnost hercegovačkoga vinogradarstva.





Slika 16. Ista parcela prije i nakon kultiviranja[4]
Figure 16. The same plot before and after tillage[4]

4 Jedan poznati istraživač je rekao: *U drugim krajevima ljudi prave plodove zemlje, u Hercegovini moraju „praviti" i zemlju.*

4 A famous researcher said; *In other areas people make fruits of the soil, in Herzegovina they have to „make" the soil as well*

Herzegovina. There are almost no more vineyards without reinforcement, while machinery has fully replaced the traditional way of production.

As Herzegovina lacks arable land, vineyards were set up on "virgin" land that was previously wooded or was barren rocky land. Such practice started in the early fifties when cooperative vineyards were established on cleared forest land or rocky grounds. Establishing of vineyards was continued later with the use of powerful machinery on previously unused land, so that barren was turned into fertile. The best example of such viticulture is the vineyard in Blizanci (Figure 15), which was planted after the distinctly karst terrain was improved for the crop.

In recent years we have witnessed increasingly frequent improvements of less fertile or infertile areas in karst. But while state companies did that earlier, private persons do that now. Such improvements of karst for vineyards result in large plots, which we have normally very few in fragmented private properties of Herzegovina. Except for former socially-owned plots, in Herzegovina it is difficult to find a plot of an area of more than 0.5 ha. They are mainly between 0.2 and 0.3 ha, which is shown in latest orthophotographs. For example, about 3,400 plots of vineyards of the total area of approximately 500 ha (without the vineyard of the Citluk winery) were registered only in the area of the Citluk municipality, and the average plot area was 0.15 ha. These are areas where it is difficult to achieve profitable production with the use of modern agricultural technology. Larger areas allow the use of machinery, irrigation and other agricultural measures. There are many such potential areas for cultivation of vines owned by the state, but their cultivation requires major investments. There are already many examples of vineyards established on previously barren and rocky soil in a number of areas of the Mostar wine-growing region, mostly around Ljubuski, Citluk and Stolac.

In addition to taking advantage of new areas, Herzegovinans also improve the production conditions. Years when yields fail because of drought are frequent in Herzegovina. To prevent that, wine-growers introduce drop-by-drop irrigation systems in vineyards. As there is no

Uzroci nestanka vinove loze u Bosni

Povijest vinogradarstva Bosne i Hercegovine je sve do početka 19. stoljeća podjednako povijest vinogradarstva u Bosni kao i u Hercegovini. Postoje brojni dokazi o prisutnosti vinove loze u različitim, pa čak u današnjim uvjetima klimatski nepovoljnim područjima Bosne. No u posljednjih stotinjak godina vinova loza uzgaja se samo u južnim dijelovima Bosne i Hercegovine, bolje reći samo u dijelovima Hercegovine koji imaju mediteransku klimu ili su na granici toga klimatskog područja. Stoga se u posljednjih 100 – 150 godina o vinogradarstvu Bosne i Hercegovine može govoriti gotovo isključivo kao o vinogradarstvu Hercegovine.

Što se dogodilo da je *Bosna – vinogradarska i vinonosna* (Kraljević, 2006.) ostala bez vinove loze? Ako izuzmemo područje Prozora gdje se vinova loza koliko-toliko održala sve do Drugoga svjetskog rata, na cijelom području Bosne u trenutku austrougarske okupacije bilo je oko dvadesetak hektara vinograda. U tom je kontekstu drastičan primjer Tuzle. Na području Gornje i Donje Tuzle bilo je u predosmanskom razdoblju više stotina hektara pod vinogradima (Handžić, 1975.), a na kraju osmanske vladavine, prilikom austrougarske okupacije zatečeno je na tom prostoru samo dva hektara zapuštenih vinograda. Valja reći da vinova loza nije iz Bosne nestala preko noći. To je proces koji je trajao od kraja 15. stoljeća, odnosno od dolaska Osmanlija u ta područja, pa do polovine 20. stoljeća.

Više je razloga koji su doprinijeli tome od islamizacije zemlje, raseljavanja kršćanskoga stanovništva, pojave novih bolesti i štetnika vinove loze, pa do klimatskih promjena tijekom minulih stoljeća. Prvi i vjerojatno najvažniji razlog smanjenja uzgoja vinove loze je islamizacija stanovništva u osmanskom razdoblju. Kura'n zabranjuje muslimanima konzumiranje alkohola i čim je počela islamizacija domicilnoga stanovništva, počelo je smanjivanje potrošnje vina i smanjenje površina pod vinogradima. Kako se smanjivala kršćanska populacija, bila je manja potražnja za vinom.

Poznato je da su i muslimani imali vinograde, ali nisu proizvodili vino već su trošili svježe grožđe ili bi od mošta proizvodili druge

running water in most wine-growing areas, wine-growers drill wells to reach groundwater supplies. It is not uncommon that they drill even deeper than 200 m to reach water. Water is pumped from underground wells and distributed in vineyards. In this way, by applying modern technology in all stages of production, Herzegovinian wine-growers achieve good yields, maintain the quality of popular varieties, and by increasing productivity in the production, guarantee the future of Herzegovinian viticulture.

Causes of disappearance of grapevines in Bosnia

Until the early 19th century, the history of viticulture of Bosnia and Herzegovina was the history of viticulture in Bosnia as much as it was of viticulture in Herzegovina. There is plenty of evidence of the presence of grapevines in various, even in the present conditions climatically unfavorable areas of Bosnia. But in the last hundred-odd years vines have been grown only in the southern parts of Bosnia and Herzegovina, better to say only in parts of Herzegovina that have Mediterranean climate, or are along the perimeter of that climatic area. Therefore, in the last 100-150 years, viticulture of Bosnia and Herzegovina can be referred to almost exclusively as the viticulture of Herzegovina.

What has happened to "Bosnia - wine-growing and wine-bearing" (Kraljevic, 2006) to be left without grapevines? With the exception of the Prozor area where grapevine was fairly well maintained until the Second World War, in the entire area of Bosnia at the time of the Austro-Hungarian occupation, there were about twenty hectares of vineyards. The example of Tuzla is drastic in this context. In the area of Upper and Lower Tuzla in the pre-Ottoman period there were several hundreds of hectares of vineyards (Handzic, 1975), while at the end of the Ottoman rule, during the Austro-Hungarian occupation only two hectares of neglected vineyards were found in that area. It should be said that grapevines did not disappear from Bosnia overnight. That is a process that lasted from the end of the 15th century, i.e. from the arrival of the Ottomans in these areas, up until the middle of the 20th century.

bezalkoholne proizvode. Evlija Čelebija (1996.) piše da muslimani u Sarajevu i u Banjoj Luci piju posebna piće od mošta poznata kao „ramazanija“ i „hardalija“, a to su zapravo vrste poluprevreloga desertnog vina. Mladom su se moštu pri ukuhavanju dodavali razni začini kako bi se neutralizirao miris vina i spriječilo vrenje. Kako piše Čelebija ramazanija krijepi i jača čovjeka za molitvu, a najbolju ramazaniju imaju imami. Od ukuhanog mošta pravio se „ćufter“, jedna vrsta želea od grožđa. Ćufter ima vrlo ugodan slatkast okus i konzumirao bi se najčešće kao desert zajedno s bademima, orasima i suhim smokvama. Zanimljivo je da se priprema ćuftera kao tradicija održala samo na području Brotnja (općina Čitluk) i djelomice Ljubuškog dok se na drugim područjima jedva može naći.

Učinak islamizacije na stanje vinogradarstva jasno se može uočiti na primjeru Foče i Goražda, mjesta u kojima je u predtursko vrijeme vinogradarstvo bilo veoma razvijeno, a danas je potpuno nestalo. Za ta mjesta postoje katastarski popisi u razmaku od jednoga stoljeća osmanske vlasti. Prvi popis rađen je 1477. godine, neposredno nakon osmanskoga osvajanja Bosne i Hercegovine, a drugi 1885. U vrijeme prvoga popisa gotovo da nije bilo muslimana u tim mjestima, a 1885. islamizacija je bila pri kraju, pa je primjerice u Foči



Slika 17. Ćufter, orijentalna slastica od ukuhanog mošta
Figure 17. Chufter, oriental sweets from boiled must

Reasons that have contributed to it are many, from the Islamization of the country, Christian population being displaced, appearance of new grapevine diseases and pests, up to climate changes over the past centuries. The first and probably most important reason for the decrease of vine cultivation is the Islamization of population in the Ottoman period. The Koran forbids the Muslims to consume alcohol, and as soon as the Islamization of the local population began, so began reduction of consumption of wine and reduction of the area of vineyards. As the Christian population was decreasing, demand for wine was lower.

It is known that the Muslims had vineyards, however they did not produce wine but used fresh grapes or produced other non-alcoholic products from must. Evliya Celebi (1996) wrote that the Muslims of Sarajevo and Banja Luka had special drinks from must known as “ramazanija” and “hardalija”, which were actually kinds of partly boiling dessert wine. While stewing, they added various spices in new must to neutralize the smell of wine and prevent fermentation. As Celebi writes, ramazanija refreshes and strengthens man for prayer, and imams had the best ramazanija. From stewed must, they made “chufter”, a kind of grape jelly. Chufter had a very pleasant sweetish taste and used to be consumed usually as dessert together with almonds, walnuts and dried figs. It is interesting that preparation of chufter survived as tradition only in Brotnjo (the municipality of Citluk), while in other areas it can hardly be found.

The impact of Islamization on the state of viticulture can be clearly seen on the example of Foca and Gorazde, towns where viticulture was highly developed in the pre-Ottoman time, and today it is completely gone. For these places, there are cadastral registers spanning an interval of one century of Ottoman rule. The first register was made in 1477, immediately after the Ottoman capturing of Bosnia and Herzegovina, and the second in 1885. During the first register, there were almost no Muslims in these towns, while in 1885 Islamization was at the end, so for example there were more than 90% of the Muslim population in Foca. In 1477, 82 tons of must were produced in Foca proper, and in 1885 only 19

bilo više od 90% muslimanskoga stanovništva. U samoj je Foči 1477. proizvedeno 82 tone mošta, a 1885. svega 19 tona. No istodobno je u Foči evidentirano oko 300 dunuma[5] vinograda u vlasništvu muslimana. Iz toga proistječe da površine pod vinogradima još uvijek nisu bile bitno smanjene nego je promijenjena struktura proizvodnje, odnosno potrošnje grožđa. Nažalost nisu nam dostupni kasniji popisi pa ne znamo kada je nestalo vinogradarstvo na tom području.

Iako je muslimanima bilo zabranjeno konzumirati alkohol, mnogi se toga, i pored oštrih kazni, nisu pridržavali. Godine 1737. zabranio je bosanski vezir Ali-paša Hekim-oglu proizvodnju i prodaju pića i kršćanima i muslimanima (Kreševljaković, 1949.). No takva zabrana bila je kratka vijeka, pa je čak je i među muslimanskim duhovnim osobama bilo pojedinaca koji su bili skloni alkoholu. Po jednom dokumentu skupina muslimana iz jedne mahale u Mostaru žalila se kadiji da njihov imam stalno pije alkoholna pića i kadija ga je suspendirao s njegove dužnosti (Mujić, 1955.). U mnogim se narodnim pjesmama također spominje uživanje alkohola među muslimanima, primjerice „Vino piju age Sarajlije“, ali se na kraju kaže da ih je „služila krčmarica Janja“, dakle nemuslimanka. No kako ističe Mujić, država je bila zainteresirana da uveća prihode od različitih poreza na vino, pa se nije mnogo ni trudila u striktnom provođenju zabrane potrošnje alkohola, barem među kršćanima.

Drugi je važan uzrok nestanka vinove loze smanjenje ili nestanak kršćanskoga, poglavito katoličkoga stanovništva. Na području Bosne u predosmansko vrijeme postojali su brojni samostani i katoličke crkve koji su imali vlastite vinograde, a neki su od njih bili veliki i uzorni vinogradari. Većina tih samostana i crkva bila je porušena u vrijeme prodora Turaka ili naknadnim ratovanjima, a svećenici pobijeni ili protjerani, što je također imalo nepovoljan učinak na stanje vinogradarstva. To je posebno karakteristično za područje sjeverne Bosne. Gotovo cijelo XVI. i dio XVII. stoljeća Turska i Austrija ratovale su na područjima Slavonije i Mađarske, a ti ratovi imali su odraza i na stanovništvo sjeverne Bosne koje je migriralo u Slavoniju ili se ponovo vraćalo

5 U osmansko vrijeme dunum je iznosio oko 900 m².

tons. But at the same time about 300 dunams[5] of vineyards owned by the Muslims were registered in Foca. It follows that the vineyard areas were still not substantially reduced but the structure of production or consumption of grapes had changed. Unfortunately, we do not have access to subsequent registers, so we do not know when viticulture disappeared in this area.

Although the Muslims were forbidden to drink alcohol, many of them did not comply with that in spite of severe penalties. In 1737, Bosnian vizier Ali Pasha Hekim-oglu banned the production and sale of drinks both to the Christians and Muslims (Kreševljaković, 1949). But such a prohibition was short-lived, and so there were individuals who were prone to alcohol even among Muslim spiritual persons. According to one document, a group of Muslims from a quarter in Mostar complained to qadi that their imam was constantly drinking alcoholic drinks and the judge suspended him from his duty (Mujic, 1955). Many folk songs also refer to drinking of alcohol among the Muslims, such as “Agas of Sarajevo drink wine”, however the end says that they were “served by bar lady Janja”, so a non-Muslim. However, as Mujic pointed out, the state was interested to increase revenues from various taxes on wine, so it did not strive much to strictly enforce the prohibition of alcohol consumption, at least among the Christians.

Another important cause of the grapevine vanishing is a decrease or decline of the Christian, particularly the Catholic population. In Bosnia in the pre-Ottoman times there were numerous monasteries and Catholic churches that had their own vineyards, and some of them were great and exemplary wine-growers. Most of these monasteries and churches were destroyed during the Turkish invasions or subsequent war campaigns, and the priests were killed or exiled, which also had an adverse effect on the state of viticulture. That was especially true in the area of northern Bosnia. Almost the entire 16th and a part of the 17th century Turkey and Austria waged wars in the areas of Slavonia and Hungary, and these wars also reflected on the population of northern Bosnia that migrated to Slavonia or

5 In the Ottoman time one dunam was about 900 m²

u Bosnu, a zadržavali su imanja u Slavoniji (Živković, 2002.).

Ratovi se izrazito nepovoljno odražavaju na stanje vinogradarstva. Raseljavanje domicilnoga stanovništva i doseljavanje novoga iz drugih područja prekida kontinuitet u uzgoju vinove loze. Vinogradari na stanovit način čine „elitu“ poljoprivrednika, jer je u uzgoju vinove loze, a posebno u pripremi vina važna stručnost i poznavanje tehnologije, a novi naseljenici time moraju tek ovladati. Tako je bilo i na području sjeverne Bosne. Umjesto izbjegla katoličkog stanovništva, Turci su naseljavali Vlahe i muslimane koji se nisu bavili vinogradarstvom. Vlasi su uglavnom bili stočari, a nakon turskoga osvajanja i domicilno kršćansko stanovništvo bježalo je u planine i bavilo se stočarstvom umjesto ratarstvom, voćarstvom i vinogradarstvom. To potvrđuje Kuripešić (1950.) koji piše da je uz putove zemlja najslabije obrađena, zbog toga što Turci, putujući tamo amo, silom oduzimaju zemlju i sve što stanovništvo ima, a ne plaćaju

again returned to Bosnia, while maintaining the estates in Slavonia (Zivkovic, 2002).

Wars had an extremely negative impact on the state of viticulture. Displacement of the local population and immigration from other areas of the new one interrupted the continuity of cultivation of grapevine. In some way, wine-growers make the “elite” of farmers, because the expertise and knowledge of technology are important in cultivation of vines, especially in the preparation of wine, and the new settlers had yet to master it. That was the case in the area of the northern Bosnia too. Instead of displaced Catholic population the Turks settled Vlachs and Muslims who did not engage in viticulture. Vlachs were mostly cattle breeders, and after the Turkish conquest the native Christian population also fled to the mountains and engaged in the cattle breeding instead of farming, fruit growing and viticulture. This is confirmed by Kuripesic (1950) who writes that beside to roads, land was cultivated the worst, because the Turks, traveling



Slika 18. U hladu samostanske odrine
Figure 18. In the shade of a monastery trellis

za to ništa. Zbog toga, kako dalje piše Kuripešić *siroti ljudi bježe sa cijelom svojom imovinom u planine i na plodne pašnjake daleko od putova, pa tu obrađuju svoju zemlju*. Tako je zbog ratova i stalnih migriranja stanovništva jednostavno prekinut kontinuitet u uzgoju vinove loze i teško ga je bilo ponovo uspostaviti.

Jedan od razloga smanjenja ili nestanka vinove loze iz kontinentalnoga područja Bosne i Hercegovine mogle bi biti klimatske promjene. Nedvojbeno je da je u srednjem vijeku vinova loza u Bosni i Hercegovini bila široko uzgajana u područjima u kojima danas ne postoji, kao što su: Goražde, Višegrad, Srebrenica, Olovo, Zenica. Klimatolozi tvrde da se između 900. i 1300. godine na sjevernoj hemisferi dogodio tzv. srednjovjekovni klimatski optimum (Medivieal Warming Period) nakon čega je slijedilo „malo ledeno doba“ koje je trajalo do polovine 19. stoljeća (Ladurie, 1971.). Postoje dokazi da je u Engleskoj i Velsu u vrijeme kralja Henrika VIII. postojalo 139 prilično velikih vinograda (www.english.wine.com). Kako se klima mijenjala, nestajali su i ti vinogradi.

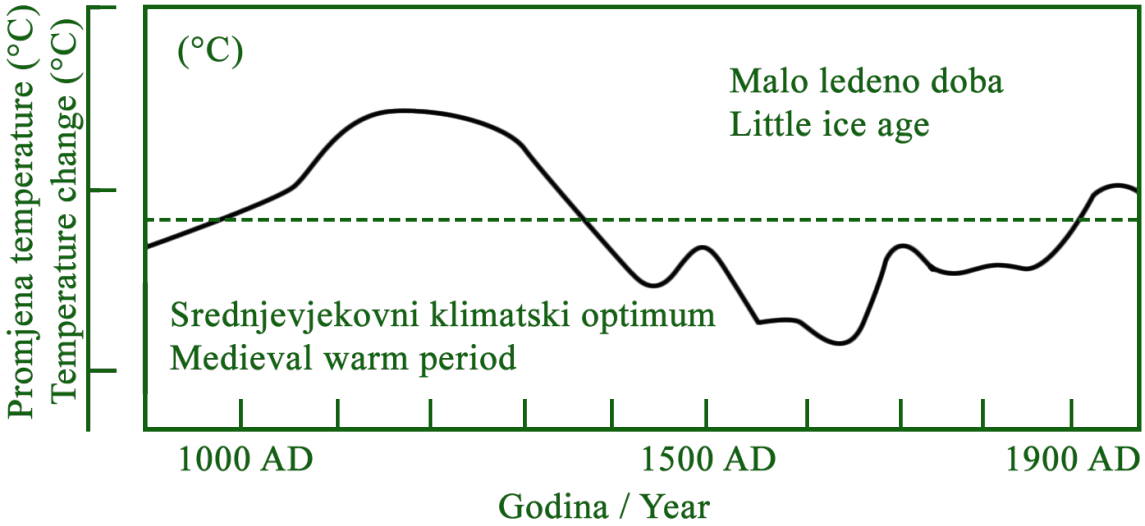
Fernand Braudel (1949.) je u djelu *Sredozemlje* naveo mnogobrojne činjenice koje ukazuju da se u drugoj polovini 16. stoljeća sredozemna, odnosno europska klima pogoršala. Stojanović (1977.) smatra da je dugoročno gledano, do 1850. hladna i vlažna faza u Europi završila, a smijenila ju je topla i suha faza koja je trajala jedno stoljeće. Otada su prosječne godišnje temperature rasle za po pola Celzijeva stupnja u pedeset godina i to svuda na Balkanu, osim u Grčkoj. Jesu li i koliko klimatske promjene sudjelovale u postupnom nestajanju vinove loze u kontinentalnim područjima Bosne i Hercegovine teško je reći, ali postoji velika mogućnost da je i taj fenomen u sinergiji s ostalim nepovoljnim čimbenicima doprinio opadanju uzgoja vinove loze u Bosni i nekim dijelovima Hercegovine. U prilog tomu može se navesti činjenica da je u nekim izrazito muslimanskim područjima poput Konjica, Stoca i okolice Mostara vinova loza bila široko uzgajana tijekom cijeloga osmanskog razdoblja.

U 10. i 11. stoljeću nastupilo je značajno malo globalno zagrijavanje kada se velikim dijelom otopio arktički led i ledenjaci na Grenlandu, tako da su Vikinzi naselili Grenland i tamo se bavili

back and forth, were seizing by force land and everything that population had, and did not pay anything for it. That is why, as Kuripesic writes further “with all their property, poor people flee to the mountains and to fertile pastures far away from roads, and cultivate their land there.” Thus, the continuity in cultivation of vines was simply interrupted by the wars and constant migrations of the population, and it was difficult to reestablish it.

One of the reasons of the decrease or disappearance of grapevine from the continental area of Bosnia and Herzegovina could be climate changes. There is no doubt that in the Middle Ages grapevine in Bosnia and Herzegovina was widely grown in areas in which it does not exist today, such as Gorazde, Visegrad, Srebrenica, Olovo, Zenica. Climatologists argue that the so-called “Medieval Climate Optimum” (Medivieal warming period) occurred in the northern hemisphere between 900 and 1300 , followed by the “little ice age” that lasted until the middle of the 19th century (Ladurie, 1971). There is evidence that there were 139 fairly large vineyards in England and Wales at the time of King Henry VIII (English.wine.com). As the climate was changing, so these vineyards were disappearing.

In his work Mediterranean, Fernand Braudel (1949) stated numerous facts indicating that the Mediterranean, or European climate had deteriorated in the second half of the 16th century. Stojanovic (1977) believes that, taking a long-term view, the cold and wet phase in Europe ended by 1850, and it was replaced by a warm and dry phase that lasted for one century. Since then, average annual temperatures grew by half a degree Celsius in fifty years and so everywhere in the Balkans, except in Greece. It is difficult to say whether climate changes participated in the gradual disappearance of grapevine in continental areas of Bosnia and Herzegovina and to what extent, but there is a high possibility that this phenomenon, in synergy with other adverse factors, contributed to the decline of wine growing in some parts of Bosnia and Herzegovina. In support of this, we can mention the fact that in some distinctly Muslim areas like Konjic, Stolac and the surroundings of Mostar grapes were widely grown throughout the Ottoman period.



Slika 19. Klimatske promjene od 10. do 20. stoljeća
Figure 19. Climate changes from 10th to 20th century

poljoprivredom i stočarstvom, te slobodno plovili arktičkim morima bez ledenjaka. Kulischer (1957.) piše da je u dunavskom području veće širenje vinogradarstva postignuto tek u 12. stoljeću, iako je na srednjoj Rajni dokazano već u 6. stoljeću. Moguće je da se u tom razdoblju vinova loza proširila u danas nepogodna područja poput Goražda, Višegrada. Kladnja, srednjega toka rijeke Bosne i slično. Nakon toga nastupilo je malo ledeno doba. Poznato je da je potkraj 16. i početkom 17. stoljeća sjeverni Jadran zimi mjesecima bio pod debelim ledenim pokrivačem po kojemu su vozile saonice, snijeg je znao pasti čak i ljeti, hladnoća je velikim dijelom uništila poljoprivredne usjeve, zavladala je glad i ratovi za hranu. (Paar, 2013.). Tvrdi se da je vrh srednjovjekovnoga toplog razdoblja bio za 2 °C viši nego danas, a donja granica u malom ledenom dobu za dva stupnja niža nego danas, što znači u najgoroj varijanti razliku od 4 °C (http://openyoureyes.com).

Pojava filoksere, plamenjače i pepelnice krajem 19. i početkom 20. stoljeća, dotad nepoznatih bolesti vinove loze na našem području, također je mogla imati stanovitoga učinka na nestanak vinove loze u Bosni. Do tada se u uzgoju vinove loze nije primjenjivala nikakva zaštita pa je uvođenje obvezne zaštite pojavom novih bolesti bitno povećalo troškove proizvodnje. U Bosni je klima humidnija i hladnija nego u Hercegovini, pa je napad patogena bio jači i zaštita teža. Filoksera se u Bosni pojavila desetak godina ranije nego

In the 10th and 11th centuries a significant little global warming occurred when the Arctic ice and glaciers in Greenland had largely melted away, so the Vikings settled Greenland and engaged in farming and cattle breeding there, and freely sailed the Arctic seas without glaciers. Kulischer (1957) writes that in the Danube area a major expansion of viticulture was achieved only in the 12th century, although in the middle Rhine it was proven as early as in the 6th century. It is possible that during that period grapevines spread to presently unsuitable areas like Gorazde, Visegrad, Kladanj, middle course of the Bosna River etc. A little ice age began after that. It is known that late in the 16th and early in the 17th century in winter the northern Adriatic was for months under a thick blanket of ice on which sleds were driven, snow used to fall even in the summer, cold largely destroyed agricultural crops, famine and wars for food became common. (Paar, 2013). It is argued that the peak of the medieval warm period was higher by 2°C than today, and in the little ice age the lower limit was lower by two degrees than today, which means the difference of 4 °C in the worst case scenario (http://openyoureyes.com).

The appearance of phylloxera, downy and powdery mildew in late 19th and early 20th centuries, previously unknown grapevine diseases in our area, could also have had certain effects on disappearance of grapevine in Bosnia. Cultivation of grapevines by then did not include application of any protection, so the introduction

u Hercegovini i nakon nje praktično nije bilo obnove vinograda.

Kako je u Bosni postupno opadalo vinogradarstvo, sve se više razvijalo voćarstvo. U sjevernoj Bosni najviše se raširila šljiva, pa je šljivarstvo zamijenilo vinogradarstvo. Turska je u Bosni zatekla razvijeno vinogradarstvo, a Austro-Ugarska je nasuprot tome našla marginalno vinogradarstvo i razvijeno šljivarstvo. Crna šljiva (Bistrica – Požegača) raširila se najviše u nekadašnjim vinogradarskim područjima. Šljiva postaje tradicionalna kultura Bosne, a rakija šljivovica usprkos vjerskoj zabrani, bila je u neku ruku "nacionalno piće" Bošnjaka kao i ostalih slavenskih naroda. Kapetan Roux-la-Mazeliere prilikom putovanja kroz Bosnu i Hercegovinu zapazio je da i kršćani nadomještaju nedostatak vina rakijom od šljiva (Jelavić. 1906.). Tako je Bosna tijekom osmanske vlasti umjesto „vinogradarske i vinonosne" postala „šljivarska i šljivonosna".

Revitalizacija vinogradarstva u sjevernoj Bosni

Tatjana Jovanović-Cvetković

Proizvodnja grožđa i vina u Bosni i Hercegovini, tradicionalno se vezuje za proizvodno područje Hercegovine. Međutim, u predtursko vrijeme vinogradarstvo je bilo razvijeno i u Bosni, naročito u dolinama rijeka. Od početka XVII i tokom XVIII vijeka i dalje, bez prekida se nastavlja proces gašenja vinogorja u slivovima bosanskih rijeka Drine, Bosne, Une, Sane, Vrbasa i Save. I dok se u Bosni, u periodu 1800. -1850., prethodno poletno vinogradarenje svodilo "samo na tragove nekadašnjeg gajenja vinove loze oko Banjaluke", dotle je vinogradarstvo Hercegovine dobro održavano, a vremenom čak i napredovalo.

Sjeverna Bosna kao potencijalno područje za širenje vinove loze, dugi vremenski period nije bila predmet sveobuhvatnih analiza, koje bi ukazivale na mogućnost njenog uzgoja na ovom staništu. Dugi niz godina na ovim prostorima gajene su stare sorte – direktno rodne loze, poznate pod nazivom mirisavke. Tek negdje pred kraj šezdesetih godina, dvadesetog vijeka

of compulsory protection with the emergence of new diseases significantly increased production costs. The climate is more humid and colder in Bosnia than in Herzegovina, and so attacks of pathogens were stronger and protection more difficult. In Bosnia phylloxera appeared about ten years earlier than in Herzegovina and after phylloxera there was practically no renewal of vineyards.

As viticulture in Bosnia was gradually decreasing, fruit growing was increasingly developing. In northern Bosnia plum trees became the most widespread, and so plum growing replaced viticulture. In Bosnia, Turkey had found the developed viticulture, and on the other hand Austria-Hungary found a marginally developed wine-growing and developed plum growing. Black plum (Bistrica - Pozegaca) spread mostly in the former wine-growing areas. Plum became the traditional crop of Bosnia and plum brandy, despite the religious prohibition, was in a way "the national drink" of Bosniaks as well as other Slavic peoples. While traveling through Bosnia and Herzegovina, Captain Roux-la-Mazeliere noted that Christians also substitute the lack of wine with plum brandy (Jelavic, 1906). Thus during the Ottoman rule, instead of "wine-growing and wine-bearing", Bosnia became "plum-growing and plum-bearing".

Revitalization of viticulture in northern Bosnia

Tatjana Jovanović-Cvetković

Production of grapes and wine in Bosnia and Herzegovina is traditionally related to the production area of Herzegovina. However, viticulture was also developed in Bosnia in the pre-Ottoman times, especially in river valleys. From the beginning of the 17th century, during the 18th century and onward, the process of extinction of wine-growing regions in the basins of Bosnian rivers of Drina, Bosna, Una, Sana, Vrbas and Sava continued uninterruptedly. And while the previously enthusiastic wine-growing in Bosnia was in the period 1800-1850 reduced to "mere traces of former cultivation of vines

dolazi do potpune zabrane ovih sorti u svim vinogradarskim područjima pa i na području sjeverne Bosne. Poslije toga vinogradi se rijetko pojavljuju na ovom području. Koncem 70-ih godina 20. vijeka na cijelom području sjeverne Bosne bilo je ukupno desetak hektara vinove loze i to uglavnom direktno rodnih hibrida. Pokretanje incijativa u prethodnom periodu (Vuksanović, 1982., Mijatović, 1987.), sa ciljem revitalizacije vinogradarske proizvodnje na području sjeverne Bosne u praksi se nisu pokazale uspješnim. Introdukcija novih sorti vinove loze pogodnih za proizvodne uslove Sjeverne Bosne, a nakon toga i uvođenje interspecies hibrida u proizvodnju, nisu dali zadovoljavajuće rezultate, prije svega zbog nedostatka tradicije u uzgoju vinove loze.

Prva introdukcija sorti na području Sjeverne Bosne

Prvi pokušaji da se obnove vinogradi i vinogradarstvo kao grana nađe svoje mjesto na području sjeverne Bosne započeti su 1981. godine podizanjem eksperimentalnim zasada sa introdukovanim sortama koje su se u prvom redu u zemljama porijekla pokazale relativno otpornijim na niske zimske temperature i neke gljivične bolesti.

Poljoprivredni fakultet u Sarajevu u tom periodu prijavljuje i dobija mogućnost realizacije projekta, koji je za cilj imao obnovu vinogradarstva na području sjeverne Bosne. Prije samog početka projekta i podizanja zasada vinove loze, izvršena je opsežna analiza velikog broja lokaliteta na ovom području u pogledu klimatskih i zemljišnih uslova. Za dalju realizaciju projekta odabrano je sedam lokaliteta na širem području sjeverne Bosne u opštinama Gradačac, Modriča, Derventa, Dubica i Gradiška.

S obzirom da uzgoj vinove loze na ovim područjima nije imao nikakvu tradiciju, veliki problem u realizaciji projekta predstavljao je i stav proizvođača, koji nisu bili spremni da započnu vinogradarsku proizvodnju na svojim posjedima. Ogledni zasadi sa standardnim i u to vrijeme novim sortama, podignuti su kod proizvođača, koji su prihvatili saradnju.

Na svim lokalitetima zasadjen je veći broj sorata, različitih epoha dozrijevanja, od najranijih do

around Banja Luka", viticulture of Herzegovina was in turn maintained well, and even progressed in the course of time.

For a long period of time northern Bosnia as potential area for expansion of vines was not subject of any comprehensive analyses that would indicate a possibility of winegrowing in this habitat. Old varieties - direct producer hybrids, known as mirisavkas (fragrant), were grown in these areas for many years. It was only sometime in the late 1960s that a complete ban on these varieties was imposed in all wine-growing areas and even in northern Bosnia. Vineyards rarely appeared in this area thereafter. In the late 1970s, there were about ten hectares of grapevines altogether in the entire area of northern Bosnia, and so mainly direct producer hybrids. Initiatives taken in the previous period (*Vuksanovic, 1982; Mijatovic, 1987*), with the purpose of revitalizing viticultural production in northern Bosnia did not turn out to be successful in practice. Introduction of new grape varieties suitable for the production conditions of northern Bosnia, followed by introduction of interspecific hybrids in production, did not produce satisfactory results, primarily because of the lack of tradition in cultivation of grapes.

The first introduction of cultivars in the area of northern Bosnia

First attempts to renew vineyards and help viticulture as a branch gain ground in northern Bosnia were begun in 1981 by setting up experimental plantations with introduced varieties that were primarily found to be relatively resistant to low winter temperatures and some fungal diseases in their countries of origin.

In this period, the Faculty of Agriculture in Sarajevo applied and was given the opportunity to implement the project that was aimed at renewing viticulture in the area of northern Bosnia. A comprehensive analysis of a large number of sites in the region in terms of climate and soil conditions was carried out before starting the project and establishing plantations of vines. Seven sites in the wider area of northern Bosnia in the municipalities of Gradacac, Modrica, Derventa, Dubica and Gradiska were selected for

sorti koje sazrijevaju krajem treće epohe, imajući u vidu specifične klimatske uslove. Svaka sorta bila je zastupljena sa po pet čokota (tablica 3.).

Nakon šestogodišnjeg perioda realizacije projekta, došlo se do zaključak da je uzgoj vinove loze na području sjeverne Bosne moguć i opravdan. Ograničavajući faktor u tom trenutku bio je ljudski faktor i ne još uvijek jasan stav lokalnih proizvođača o mogućnostima i perspektivi vinogradarske proizvodnje. Ovo je posebno otežavao nedostatak stručne službe koja bi bila u stanju da tu proizvodnju podrži svojim savjetodavnim uslugama u svim segmentima proizvodnje.

Pokušaj intenziviranja vinogradarske proizvodnje na području sjeverne Bosne u tom periodu bio



Slika 20. Pokus s novom sortom u sjevernoj Bosni
Figure 20. Experiment with a new cultivar in northern Bosnia

je značajno opterećen tradicionalnim odnosom proizvođača prema pojedinim voćnim vrstama (prije svega šljiva, a zatim i jabuka i kruška) i

further implementation of the project.

Considering that cultivation of vines did not have any tradition in these areas, the major problem in implementation of the project was the position of producers who were unwilling to engage in wine-growing production on their properties.

Tablica 3. Sorte ispitivane u ogledima u sjevernoj Bosni
Table 3. Varieties tested in the trials in northern Bosnia

Vinske sorte - bijele: White wine varieties		Šasla bijela, Burgundac sivi, Traminac crveni, Neoplanta, Župljanka, Rizling rajnski, Rizling italijanski, Rkaciteli
Vinske sorte - crne: Red wine varieties		Game bojadiser, Alikant buše, Prokupac
Stone sorte Table varieties	*Najranije/* *Earliest*	Biserka rana, Beogradska rana, Opuzenska rana, Gročanka, Demir kapija, Kraljica vinograda, Julski muskat.
	Rane /early	Radmilovački muskat, Erli muskat
	Srednje rane/ *Medium early*	Ribijer, Smederevski muskat, Beogradska besjemena
	Kasne/late	Muskat hamburg, Afus ali, Smederevka

Test plantations with standard and the then new varieties were established with producers who agreed to cooperate.

Bearing in mind the specific climatic conditions, a fairly large number of varieties with different ripening epochs, from earliest to the varieties that ripen in late third epoch, were planted in all the sites. Each variety was represented with five vines (Table 3).

The conclusion that cultivation of vines in northern Bosnia was feasible and justified was reached after a six years' period of project implementation. At that point, the limiting factor was the human factor and still unclear position of local producers on possibilities and prospects of grape production. This was particularly exacerbated by the lack of professional services that would be able to support this production with its advisory services in all aspects of production.

Efforts to intensify the viticultural production in the area of northern Bosnia during this period were significantly burdened by the traditional attitude of producers about some fruit species (especially plums, and then also apple and pear) and a relatively satisfactory level of production of these species that resulted in economic profits for producers.

relativno zadovoljavajućim nivoom proizvodnje ovih vrsta, koja je rezultirala ekonomskom dobiti za proizvođače.

Druga introdukcija sorti na području sjeverne Bosne

Zadnjih dvadesetak godina kao rezultat promjena u ljudi i opredjeljenja pojedinih opštinskih i republičkih struktura, da podrže vinogradarsku proizvodnju, došlo je do unapređenja vinogradarstva u sjevernoj Bosni. U isto vrijeme, započinje i proces proizvodnje sadnog materijala vinove loze, što rezultira činjenicom da je u periodu 2000. do 2011. na prostorima sjeverne Bosne proizvedeno preko 200.000 kalemova vinove loze. Sva proizvodnja je plasirana u okruženju, što je dalo značajan zamah vinogradarstvu. Na žalost u tom periodu, spontano je došlo do uvođenja i sorti koje nisu pogodne za kontinentalne uslove i koje pokazuju veliku osjetljivost prema niskim zimskim temperaturama kao što su Vranac, Kardinal, Kraljica vinograda itd. U tom periodu podignut je veći broj vinograda na različitim lokacijama, kod kojih je izbor sorata bio prilagođen lokalnim agroekološkim uslovima (tablica 4).

The second introduction of cultivars in the area of northern Bosnia

Changes in people and commitment of certain municipal and state officials to support vineyard production in the last twenty years resulted in improvement of viticulture in northern Bosnia. The process of production of vine planting material was also begun at the same time, resulting in over 200,000 grafted vines produced in the period 2000-2011 in the areas of northern Bosnia. The entire production was marketed locally, which gave a significant momentum to viticulture. Unfortunately, the varieties that are not suitable for continental conditions and that show a high sensitivity to low winter temperatures, such as Vranac, Kardinal, Kraljica vinograda, etc., were spontaneously introduced during this period. Many vineyards with a selection of cultivars adapted to local climatic and soil conditions were established on various sites in this period (table 4).

Tablica 4. Sorte vinove loze ispitivane u drugoj introdukciji

Table 4. Grapevine cultivars tested during second introduction

Lokacija - Site	Sorte - Cultivars
Klekovci (Dubica)	Chardonnay, Graševina, Sauvignon blanc, Pinot blanc, Traminac, Muscat ottonel Pinot noir
Slatina (Laktaši)	Chardonnay, Sauvignon blanc, Riesling rajnski, Muscat ottonel Pinot noir, Cabernet Sauvignon
Mahovljani (Laktaši)	Riesling rajnski, Cabernet Sauvignon
Jablan (Laktaši)	Chardonnay, Graševina, Sauvignon blanc, Pinot gris, Merlot, Cabernet Sauvignon, Frankovka
Markovac (Čelinac)	Chardonnay, Riesling rajnski, Pinot blanc Frankovka, Merlot, Cabernet Sauvignon
Lišnja (Prnjavor)	Chardonnay, Riesling rajnski Pinot noir, Cabernet Sauvignon, Frankovka, Merlot, Syrah
Štrpci (Prnjavor)	Riesling rajinski, Tokajac, Proseco, Chardonnay, Cabernet franc, Cabernet Sauvignon, Merlot
Vijačani (Prnjavor)	Chardonnay, Traminac, Sauvignon blanc, Pinot blanc Pinot noir, Cabernet Sauvignon
Mašinci (Derventa)	Pinot blanc, Pinot gris, Chardonnay Pinot noir, Merlot, Frankovka

In addition to the above mentioned, smaller vine plantations ranging from 0.5 to 2 ha were established in territories of the municipalities of Prijedor, Dubica, Gradiska, Laktasi, Banja Luka, Prnjavor, Teslic, Derventa and other municipalities of the northern part of the Republic of Srpska.



Slika 21. Kolekcijski zasad u sjeverenoj Bosni
Figure 21. Collection nursery in northern Bosnia

Osim gore navedenih na teritoriji opština Prijedor, Dubica, Gradiška, Laktaši, Banja Luka, Prnjavor, Teslić, Derventa i drugih opština sjevernog dijela Republike Srpske podignuti su manji zasadi pod vinovom lozom, površine od 0,5 do 2 ha.

Imajući u vidu da je na ovom području vinova loza od davnina gajena kao divlja (direktno rodna loza – mirisavke) u preporuci za podizanje manjih vinograda više pažnje posvećeno je novim interspecies hibridima vinove loze koji ne zahtijevaju visok nivo primjene agrotehničkih odnosno ampelotehničkih mjera. Stoga je Poljoprivredni fakultet Univerziteta u Banjoj Luci 2008. godine započeo aktivnosti na uspostavljanju kolekcionog vinograda na području sela Sjeverovci (Dubica). Na lokalitetu dominira tip zemljišta vertisol - smonica (glinuša), reakcije zemljišta jako kisela. Sadržaj humusa i lakopristupačnog kalijuma je osrednji, dok je sadržaj lakopristupačnog fosfora nizak. Srednja godišnja temperatura vazduha iznosi 12^0C, vegetaciona 18^0C, a godišnja suma padavina oko 800 mm.

Od svake sorte je zasađeno po 10 čokota. U kolekciji ima 10 vinskih i 10 stonih sorti

Bearing in mind that vines were grown as wild (hybrid direct producers - mirisavkas) in this area since ancient times, recommendations for planting smaller vineyards devoted more attention to new interspecific grape hybrids that do not require high levels of application of agro-technical or ampelotechnical measures. Therefore in 2008, the Faculty of Agriculture, University of Banja Luka, started activities aimed at establishing a collection vineyard in the area of the village of Sjeverovac (Dubica). The soil type predominant at the site is vertisol - smonica (clayey soil), with a strongly acidic reaction of soil. The content of humus and readily available potassium is medium, while content of readily available phosphorus is low. The average annual air temperature is 12^0C, in vegetation 18^0C, and the annual sum of precipitation around 800 mm.

Ten vines of each cultivar were planted. The collection contains 10 wine and 10 table cultivars originating from *Vitis vinifera* L. In addition to these, there are also 29 interspecific hybrids in the collection.

All cultivars are grown in a single Guyot system with the application of combined pruning. The

porijeklom od *Vitis vinifera* L. Pored ovih u kolekciji se nalaze i 29 interspecies hibrida.

Sve sorte se gaje u sistemu Gijo jednogubi uz primjenu kombinovane rezidbe. Razmak sadnje iznosi 3 x 1m. U zasadu se primjenjuju standardne agro- i ampelotehničke mjere, uz manji broj tretiranja kod sorti interspecies tipa.

Od sorti interspecies hibrida tu se između ostalog nalaze:

- vinske bijele sorte: Panonia, Petra, Morava, Villard blanc, Merzling, Bianca, Kunbarat, i neke druge
- vinske crne sorte: Chancelor, Villard noir, i neke druge
- stone sorte: Lasta, Karmen, Moldova, Esther, Muscat St. Vallier

U kolekciji se nalaze i poznate vinske i stone sorte:

- vinske bijele sorte: Rizling italijanski, Rizling SK 54, Chardonnay, Sila, Muscat Otonel i Chasselas rose.
- Vinske crne sorte: Cabernet Sauvignon, Merlot, Pinot noir, Probus, i Frankovka
- stone sorte: Italija, Palatina, Gročanka, Early muscat, Beogradska rana, Beogradska besjemena, Matilde, Muskat hamburg, Black magic i Pallieri.

Druga introdukcija i provedena istraživanja bila su uspješna, tako da se zadnjih petnaestak godina vinova loza sve više širi na području sjeverne Bosne.

planting distance is 3 x 1m. Standard agro- and empelo-technical measures are applied in the plantation, with a smaller number of treatments in interspecific type cultivars.

Among others, the following cultivars of interspecific hybrids are found there:

- white wine cultivars: Panonia, Petra, Morava, Villard blanc, Merzling, Bianca, Kunbarat, and some others
- red wine cultivars: Chancelor, Villard noir, and some others.
- table cultivars: Lasta, Karmen, Moldova, Esther, Muscat St. Vallier, and some others.

The collection also contains the well-known wine and table cultivars:

- white wine cultivars: Rizling italijanski, Rizling SK 54, Chardonnay, Sila, Muscat Otonel and Chasselas rose.
- red wine cultivars: Caberne Sauvignon, Merlot, Pinot noir, Probus, and Frankovka
- table cultivars: Italija, Palatina, Grocanka, Earli muscat, Beogradska rana, Beogradska besjemena, Matilde, Muskat hamburg, Black magic and Pallieri.

The second introduction and the conducted studies were successful, so that grapevines have been increasingly spreading in the area of northern Bosnia over the past fifteen years or so.

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UVJETI PROIZVODNJE

Agroekološki uvjeti proizvodnje grožđa

Viktor Lasić

Najvažniji čimbenici uzgojnih uvjeta za vinovu lozu su klima i tlo. Njihov utjecaj može se u stanovitoj mjeri mijenjati izborom sorte i podloge, pravilnim odabirom kvalitetna (*virus free*) sadnog materijala i odgovarajućom primjenom agrotehničkih mjera. Poznavanje je sorata i podloga vinove loze bitno za proizvodnju jer imaju različite zahtjeve prema uvjetima klime i tla. Zahtjevi prema uvjetima klime i tla su osobnost vrste i sorte stečena tijekom filogenetskoga i evolucijskoga razvoja.

Klimatski čimbenici

Klima ima odlučujući utjecaj za određivanje pogodnosti nekoga područja za uzgoj vinove loze. Makroklimatski elementi koriste se za određivanje pogodnosti za uzgoj vinove loze šireg područja kao što su: rajoni, podrajoni i vinogorja, dok se za vrednovanje užih područja kao što su lokaliteti koriste mezoklimatski ili mikroklimatski elementi (lokalni vjetrovi, pojava mraza, tuče i magle). Prije podizanja vinograda treba dobro upoznati klimu područja u višegodišnjem razdoblju i za te klimatske prilike izabrati za sadnju odgovarajući sortiment vinove loze. Zbog važnosti poznavanja ekoloških uvjeta za vinogradarsku proizvodnju, vinogradarske države izrađuju dokument pod nazivom *Rajonizacija vinogradarske proizvodnje*, u kojem su elementi klime obrađeni od rajona do lokaliteta u višegodišnjem razdoblju (najmanje deset godina). Sa stajališta vinogradarske proizvodnje odlučujući makroklimatski elementi su: toplina, osunčanost, vlažnost i vjetrovi.

CONDITIONS OF PRODUCTION

Agro-ecological conditions of production of grapes

Viktor Lasić

The most important factors of growing conditions for grapes are climate and soil. Impacts of these factors may be changed to some extent by choosing the cultivar and rootstock, selecting a proper high-quality (virus free) planting material and applying appropriate agro-technical measures. Knowledge of varieties and rootstocks of grapevines is essential for production because they have different requirements for climate and soil conditions. Climate and soil requirements are the specific feature of the species and cultivar, acquired during the phylogenetic and evolutionary development.

Climatic factors

Climate has a decisive effect in determining the suitability of an area for cultivation of vines. Macroclimatic elements are used in determining the suitability for cultivation of vines in wider areas such as zones, subzones and vine-growing regions, while evaluation of narrower areas such as sites use mesoclimatic or microclimatic elements (local winds, the occurrence of frost, hail and fog). Before planting a vineyard, it is necessary to become quite familiar with climate in the area over a period of several years and select the appropriate cultivars of grapevines for planting in these climatic conditions. As it is important to know the environmental conditions for vineyard production, wine-growing countries prepare a document titled "Zoning of grape production" that treats climate elements from zones to sites over a period of several years (at least 10 years). From the standpoint of viticultural production, the crucial macroclimatic elements

Kao pokazatelj toplotnih karakteristika najčešće se koristi **termički koeficijent** koji se izračunava po formuli:

$$TK = \frac{tX - tIV}{A} \cdot 100$$

TK = termički koeficijent

tX = srednja mjesečna temperatura za mjesec listopad

tIV = srednja mjesečna temperatura za mjesec travanj

A = godišnje kolebanje temperature zraka

Kada su izračunate vrijednosti TK veće od 15%, one označavaju uvjet maritimne klime u kojima su toplotni uvjeti povoljniji za gajenje vinove loze. Manje vrijednosti od 15% označavaju uvjete kontinentalne klime. Snižavanje TK vrijednosti, sve do negativnih, označavaju izraženiju kontinentalnost klime i smanjenje povoljnih uvjeta za gajenje vinove loze.

Temperatura

Za mogućnost uzgoja vinove loze nužno je poznavati **srednju godišnju temperaturu**, srednju vegetacijsku temperaturu i temperaturne sume, godišnju i vegetacijsku, kroz višegodišnje razdoblje. Također je potrebno poznavati utjecaj niskih temperatura i visokih temperatura zraka i dužinu trajanja razdoblja vegetacije za određeno područje. Vinova loza može se uspješno uzgajati na područjima čija srednja godišnja temperatura za višegodišnji period iznosi od 9 ^{0}C do 21 ^{0}C. U svom godišnjem ciklusu vinova loza ima različite potrebe za toplinom u različitim fenofazama razvoja. Za početak vegetacije odnosno fenofaze otvaranja pupova, potrebno je nekoliko dana sa srednjom dnevnom temperaturom iznad 10 ^{0}C. U vinogradarskoj praksi **srednja dnevna temperatura** od 10 ^{0}C označava se kao **biološka nula**. Za početak fenofaze cvjetanja potrebne su srednje dnevne temperature iznad 15 ^{0}C. Za početak sazrijevanja grožđa potrebna je srednja dnevna temperatura iznad 16,5 ^{0}C, a za kraj dozrijevanja trebaju srednje dnevne temperature iznad 12 ^{0}C. Optimalne temperature u fenofazi cvjetanja su od 25 ^{0}C do 30 ^{0}C, a za

are: temperatures, sunlight, humidity and winds.

Thermal coefficient is most often used as an indicator of thermal characteristics. It is calculated by the following formula:

$$TK = \frac{tX - tIV}{A} \cdot 100$$

TK = thermic coefficient

tX = the average monthly temperature for October

tIV = the average monthly temperature for April

A = annual fluctuation of air temperatures

When the calculated value of TK is greater than 15%, then the maritime climate conditions are marked. Such conditions are favorable for growing of vines. The values less than 15% indicate the conditions of the continental climate. Lowering the value of TK, even to negative one, indicate pronounced continentality of climate and thus reducing benefits for growing vines.

Temperatures

For a possibility of growing grapes, it is necessary to know the **average annual air temperature**, average air temperature in vegetation and temperature sums, annual and vegetation one, through a period of several years. It is also necessary to know the influence of low air temperatures and high air temperatures and duration of the vegetation period for the particular area. Grapes can be successfully grown in areas whose average annual air temperature for a period of several years is from 9^0 C to 21^0 C. In its annual cycle, grapevine has different warmth needs in different developmental stages. Beginning of vegetation, or the bud opening phenophase, requires several days of average daily air temperatures above 10^{0}C. In viticultural practice, **the average daily air temperature** of 10 ^{0}C is denoted as the **biological zero**. Beginning of the flowering phenophase needs average daily air temperatures above 15 ^{0}C. Grape veraison requires average daily air temperatures above 16,5 ^{0}C, and completion of ripening requires average daily air temperatures above 12^0 C. The optimum temperatures in the flowering

fenofazu dozrijevanja grožđa su od 28 ^{0}C do 32 ^{0}C. Osim toga za prikazivanje temperaturnih uvjeta vinogradarske proizvodnje nužno je poznavati i temperaturne sume. **Godišnja suma temperature** zraka predstavlja zbroj prosječnih dnevnih temperatura zraka. **Suma aktivnih temperatura** (temperaturna suma, ukupna suma toplotnih stupnjeva) zraka dobije se zbrajanjem svih srednjih dnevnih temperatura iznad 10 ^{0}C za određeno razdoblja. **Suma efektivnih temperatura** zraka dobije se zbrajanjem svih srednjih dnevnih temperatura zraka za određeno razdoblje umanjenih za umnožak broja dana i vrijednosti 10 ^{0}C (biološka nula) za isto razdoblje.

Na temelju sume efektivnih temperatura zraka Winkler (1962.) je na primjeru Kalifornije podijelio vinogradarsku proizvodnju u pet zona prikazanih u tablici 5.

phenophase are from 25^{0}C to 30 ^{0}C, and for the grape ripening phenophase they are from 28^{0}C do 32^0 C. Temperature sums are also important for description of temperature conditions for viticultural production. **Annual air temperature sum** is the sum of average daily air temperatures. **Sum of active air temperatures** (the sum of temperatures, the total sum of warmth degrees) is evaluated by summing all average daily air temperatures of a period. **Sum of effective air temperatures** is obtained by summing all average daily air temperatures of a period decreased by the multiplication product of the number of days and values 10^{0}C (biological zero) for the same period.

Based on the sum of effective air temperatures using the example of California, Winkler (1962) divided production of grapes into five zones shown in Table 5.

Tablica 5. Podjela vinogradarskih zona prema Winkleru
Table 5. Classification of wine-growing zones according to Winkler

Vinogradarska zona Wine-growing zone	Suma efektivnih temperatura zraka (^{0}C) Sum of effective air temperatures (^{0} C)
1.	manje od - less than 1.390
2.	od - from 1.390 do - to 1.670
3.	od - from 1.670 do - to 1.945
4.	od - from 1.945 do - to 2.200
5.	iznad - more than 2.200

Sukladno Winklerovoj podjeli prema sumama efektivnih temperatura u Europi je 1970. godine napravljena podjela na zone A, B, C_1, C_2 i C_3. Zone A i B su za sjevernija vinogradarska područja, a zone C_2 i C_3 su za južna vinogradarska područja. Vinogradarski rajon sjeverne Bosne spada u zonu C_1, a vinogradarski rajon Hercegovine u zonu C_2.

Djelovanje niskih temperatura na vinovu lozu ovisi o fazama razvoja vinove loze. Vinova loza je najosjetljivija na niske temperature u vegetaciji i to njezine mladice u fazi intenzivna rasta, a najotpornija u razdoblju mirovanja. Za uspješan je uzgoj vinove loze od presudne važnosti vrijeme pojave kasno proljetnoga i rano jesenjega mraza, odnosno trajanje bezmrazna razdoblja. Sva vinogorja u Bosni i Hercegovini imaju dovoljnu dužinu trajanja bezmrazna razdoblja za uzgoj vinove loze.

Visoke temperature također mogu izazvati

Consistently with Winkler's classification using sums of effective temperatures, the division into zones A, B, C_1, C_2 and C_3 was made in Europe in 1970. Zones A and B are for northern wine-growing areas, while zones C_2 and C_3 are for southern wine-growing areas. Viticultural zones of northern Bosnia belong to the zone C_1, and the viticultural zone of Herzegovina to the zone C_2.

Effects of low temperatures on grapevines depend on development stages of vines**.** Vines are the most sensitive to low temperatures in vegetation, specifically its branches in the phase of intensive growth, and they are the most resistant during dormancy. For successful cultivation of grapes, the time of occurrence of late spring frost and early fall frost, or duration of frost-free period, is of a crucial importance. All wine-growing regions in Bosnia and Herzegovina have a sufficient duration of frost-free period for cultivation of grapes.

oštećenja na organima vinove loze. Rast i razvoj vinove loze odvija se na temperaturama do 38 ^{0}C, a na većim temperaturama prestaje rast mladica. Na temperaturama iznad 40 ^{0}C, ako potraju duže vrijeme, nastaju oštećenja na listovima i bobicama. Takve temperature pojavljuju se povremeno u Hercegovini.

Sunčeva svjetlost

Pogodnost nekoga područja za uzgoj vinove loze, sa stajališta trajanja sunčeva sjaja i efektivnih temperatura, izražava se **heliotermičkim koeficijentom.**

$HTK_1 = Te \times Ss \times 10^{-6}$
HTK_1 – Heliotermički koeficijent
Te – Suma efektivnih temperatura zraka (^{0}C)
Ss – Vrijeme trajanja sunčeva sjaja (sati)

Optimalne vrijednosti heliotermičkoga koeficijenta za područja uzgoja, najvećega broja sorata vinove loze, kreću se u rasponu od 2,6 do 4,5. Područja s heliotermičkim koeficijentom ispod 2,6 nisu pogodna za uzgoj vinove loze i predstavljaju sjevernu granicu uzgoja.

Vlažnost

Vinova loza slovi kao dosta otporna vrsta na sušu jer se uspješno uzgaja u područjima s visokim temperaturama i s relativno malom količinom oborina. Optimalna godišnja **količina oborina** za uzgoj vinove loze na nekom području iznosi od 600 mm do 800 mm. Te vrijednosti treba uzeti s dosta rezerve jer potrebe za vodom ovise i o rasporedu oborina. Vinova loza najbolje izražava svoj biološki potencijal u uvjetima **relativne vlažnosti zraka** od 60 % do 70 %. Za izražavanje pogodnosti područja za uzgoj vinove loze sa stajališta oborina i aktivnih temperatura zraka služi nam **hidrotermički koeficijent** (po Seljaninovu).

$$HTK = \frac{Ho * 10}{Ta}$$

HTK – Hidrotermički koeficijent
Ho – Suma oborina u razdoblju vegetacije (mm)
Ta – Suma aktivnih temperatura u razdoblju vegetacije(^{0}C)

Vrijednosti hidrotermičkoga koeficijenta od 1 do 2 upućuju na povoljnu vlažnost tla za uzgoj vinove loze.

High temperatures can also cause damage to vine organs. Growth and development of vines take place at temperatures up to 38 ^{0}C, and at higher temperatures shoots stop growing. Temperatures above 40 ^{0}C, if continue for a longer time, cause damage to leaves and berries. Such temperatures occasionally occur in Herzegovina.

Sunlight

Suitability of an area for cultivation of vines, from the viewpoint of sunlight duration and effective temperatures, is expressed by the **helio-thermic coefficient.**

$HTK_1 = Te \times Ss \times 10^{-6}$
HTK_1 – Helio-thermic coefficient
Te – Sum of effective air temperatures (^{0}C)
Ss – Duration of sunlight - insolation (hours)

Optimum values of helio-thermic coefficient for growing areas of most of grape cultivars range from 2.8 to 4.5. Areas with helio-thermic coefficients lower than 2.8 are not suitable for winegrowing and represent the northern limit of cultivation.

Humidity

Grapevine is regarded as a species rather resistant to drought because it is successfully grown in areas with high temperatures and with relatively little rainfall. The optimum annual **precipitation** for cultivation of grapevines in an area is from 600 mm to 800 mm. These values should be taken with a grain of salt because water needs depend on distribution of precipitation. Grapevine shows the best its biological potential in conditions of **relative air humidity** from 60% to 70%. To express suitability of an area for cultivation of vines in terms of precipitation and active air temperatures, we use the **hydro-thermic coefficient** (according to Seljaninov).

$$HTK = \frac{Ho * 10}{Ta}$$

HTK – Hydro-thermic coefficient
Ho – Precipitation sum in the vegetation period (mm)
Ta – Sum of active air temperatures in the vegetation period (^{0}C)

Za procjenu pogodnosti klime nekoga područja za uzgoj vinove loze služi nam bioklimatski indeks. **Bioklimatski indeks** povezuje dužinu razdoblja vegetacije i klimatske elemente temperaturu, sunčevu svjetlost i oborine.

$$BKI = \frac{Ta \times Ss}{Ho \times Dv \times 10}$$

BKI – Bioklimatski indeks

Ta – Suma aktivnih temperatura u razdoblju vegetacije(^{0}C)

Ss – Vrijeme trajanja sunčeva sjaja (sati)

Ho – Suma oborina u razdoblju vegetacije (mm)

Dv – Dužina trajanja razdoblja vegetacije (dana)

Optimalne vrijednosti bioklimatskoga indeksa kreću se u širokom rasponu od 5 do 15. Bioklimatski indeks i hidrotermički koeficijent ne smiju biti eliminacijski.

Vjetar

Vjetrovi mogu imati nepovoljan utjecaj na vinovu lozu pa se u područjima s jakim vjetrovima radi zaštite sade vjetrozaštitni pojasevi okomito na smjer vjetrova.

A value of the hydro-thermic coefficient from 1 to 2 indicates a favorable humidity of soil for cultivation of vines.

Bio-climatic index is used to evaluate suitability of an area for winegrowing. Bio-climatic index correlates duration of the vegetation period and climate elements temperature, sunlight and precipitation.

$$BKI = \frac{Ta \times Ss}{Ho \times Dv \times 10}$$

BKI – Bio-climatic index

Ta – Sum of active air temperatures in the vegetation period (^{0}C)

Ss – Duration of sunlight (hours)

Ho – Precipitation sum in the vegetation period (mm)

Dv – Duration of the vegetation period (days)

Optimum values of the bio-climatic index widely range from 3 to 10. In the wine regions of Bosnia and Herzegovina bioclimatic index ranges from 3 to 5.2. Bioclimatic index and hydro-thermic coefficient must not be eliminatory.



Slika 22. Navodnjavanje kap po kap
Figure 22. Drip irrigation

Neki čimbenici kao što su: geografska širina, nadmorska visina, reljef, blizina velikih vodenih površina i blizina šuma mogu dovesti do promjena klimatskih elemenata. Geografska širina je ograničavajući čimbenik uzgoja biljnih vrsta. Područje uzgoja vinove loze prostire se između 25^0 i 52^0 sjeverne geografske širine. Ta granica uzgoja ne predstavlja ravnu crtu, nego se može prostirati i sjevernije kroz doline rijeka i prisojne strane brežuljaka do 58^0 sjeverne geografske širine, ali i južno od 52^0 ovisno o nadmorskim visinama i osojnim stranama brežuljaka. Najpovoljniji uvjeti za uzgoj vinove loze nalaze se od 35^0 do 45^0 sjeverne geografske širine. Na južnoj hemisferi, područje uzgoja vinove loze prostire se između 30^0 i 45^0 južne geografske širine. Država BiH prostire se između 42^0 34‟ i 45^0 16‟ sjeverne geografske širine i u cijelosti se nalazi u zoni uzgoja vinove loze. Uzgoj vinove loze na cijelom prostoru BiH ograničavaju drugi klimatski elementi.

Nadmorska visina utječe na temperaturu i oborine. Godišnja temperaturna suma se porastom nadmorske visine za 100 m smanji između 190 ^{0}C i 260 ^{0}C. Najveći dio vinograda u Hercegovini nalazi se između 50 i 150 m nadmorske visine. Vinograd *Višići* nalazi se na -1 do 5 m nadmorske visine, a vinograd *Trtle* na oko 450 m nadmorske visine. Ovisno o geografskoj širini i klimatskim uvjetima različite su nadmorske visine uzgoja vinove loze. **Blizina velikih vodenih površina** (mora, jezera i rijeka) utječe na klimu područja zbog njihova sporijega zagrijavanja i hlađenja. Temperaturna variranja i variranja vlažnosti zraka su znatno manja u blizini velikih vodenih masa te se tako stvaraju povoljniji uvjeti za uzgoj vinove loze.

Reljef utječe na uvjete uzgoja vinove loze preko klimatskih elemenata vlažnosti i temperature. Za uzgoj vinove loze povoljniji su brežuljci od kotlina iako kotline u pravilu imaju plodnije tipove tla. Zbog količine toplote i osunčanosti pogodnije su južne i zapadne ekspozicije brežuljaka nego sjeverne i istočne. U uvjetima Hercegovine, za uzgoj vinove loze mogu se koristiti i sjeverne ekspozicije na nižim nadmorskim visinama, jer grožđe i mladice mogu potpuno dozreti zbog povoljnih klimatskih uvjeta. **Šume** mogu imati utjecaja na klimu ublažavanjem temperaturnih ekstrema i povećavanjem vlažnosti zraka. Šuma može služiti i kao zaštitni pojas od jakoga vjetra sprječavanjem loma mladica, a ublažavanjem

Wind

Winds can have an adverse effect on vines so that wind barrier zones are planted perpendicular to the direction of winds for protection in areas with strong winds.

Some factors such as geographic latitude, altitude, relief, proximity to large water bodies and proximity to forests may lead to changes in climatic elements. Geographic latitude is a limiting factor for cultivation of plant species. The area of cultivation of grapevine extends between 25^0 and 52^0 north geographic latitude. This cultivation limit is not a straight line, but can also spread to the north through river valleys and hillsides exposed to sun to 58^0 north geographic latitude, and south from 52^0, depending on altitude and shady hillsides. The most favorable conditions for cultivation of grapevine are from 35^0 to 45^0 north geographic latitude. On the southern hemisphere, grape growing area stretches between 30^0 and 45^0 south geographic latitude. The state of Bosnia and Herzegovina extends between 42^0 34‟ and 45^0 16‟ north geographic latitude and it is entirely within the grape growing zone. Cultivation of vines in the entire area of Bosnia and Herzegovina is limited by other climate elements.

Altitude affects temperatures and rainfall. As altitude increases by 100 m, annual temperature sum decreases between 190^0 C and 260^0 C. Most vineyards in Herzegovina are at altitudes between 50 and 150 m. The vineyard Visici is at -1 to 5 m above sea level, and the vineyard Trtle is at around 450 m above sea level. The vineyards of northern Bosnia are located at an altitude of 100-400 m above sea level. Winegrowing altitudes vary depending on geographic latitude and climate conditions. **Proximity of large water bodies** (seas, lakes and rivers) affects climate of the area owing to their slower warming and cooling. Temperature fluctuations and humidity fluctuations are considerably lesser in the proximity of large water bodies, thereby creating more favorable conditions for grape growing.

Relief affects grape growing conditions through climate elements of humidity and temperature. Hills are more favorable for cultivation of grapevines than valleys although valleys typically have more fertile soil types. In view of warmth

strujanja zraka pomažu sačuvati vlažnost.

Zemljišni čimbenici

Vinova loza je kultura koja ima veliku moć prilagodbe na razne tipove tla. Tu sposobnost vinove loze treba zahvaliti sustavu korijena koji ima moć dubokoga prodiranja u tlo i moć širenja kroz veću površinu tla. Vinova loza može se uzgajati na tlima na kojima se druge poljoprivredne kulture uopće ne mogu uzgajati ili na tim tlima nije ekonomična proizvodnja. Vrijednost tla za poljoprivrednu proizvodnju ovisi o mehaničkom sastavu, fizikalnim i kemijskim svojstvima tla. Mehanički sastav tla ovisi o zastupljenosti i veličini pojedinih frakcija tla, kao što su: pijesak, glina, kamenje i stijene. Najpovoljnija tla za uzgoj vinove loze, sa stajališta strukture tla, su ona s mrvičastom strukturom čija se veličina agregata kreće od 1 mm do 10 mm. Fizička svojstva i kemijske svojstva, te pH-vrijednost tla određuju njihovu pogodnost za uzgoj vinove loze. Za razvoj vinove loze najpovoljnije pH-vrijednosti tla su od 6 do 6,5, a zadovoljavajući porast i urod vinova loza postiže u pH-vrijednostima od minimalno 5 do maksimalno 8,4. Fizička svojstva i kemijska svojstva tla mogu se bitno popraviti odgovarajućim agrotehničkim mjerama.

Bosna i Hercegovina, zbog heterogenosti geološke građe i utjecaja drugih pedogenetskih procesa, ima velik broj tipova i podtipova tla. Tla prema općim svojstvima mogu biti:



Slika 23. Tlo pogodno za vinogradarsku proizvodnju
Figure 23. Soil suitable for grapevine

quantities and exposure to sunlight, southern and western expositions of hills are more suitable than northern and eastern ones. In conditions of Herzegovina, northern expositions at lower altitudes can also be used for cultivation of vines because grapes and shoots can fully ripen thanks to favorable climate conditions. **Forests** may have an influence on climate by reducing temperature extremes and increasing air humidity. Forest can function as a zone of protection against strong winds, thus preventing breaking of shoots, and by reducing airflows it helps maintain humidity.

Soil factors

Grapevine is a crop that has a high adaptability to various soil types. This ability of vines is due to the root system that has the ability of deep penetration into soil and the ability to expand through larger area of the terrain. Vines can be grown on soils on which other agricultural crops cannot be grown at all or their production on these soils is not economical. Value of a soil for agricultural production depends on its mechanical structure, physical and chemical properties of soil. The mechanical composition of soil depends on presence and proportions of specific soil fractions, such as: sand, clay, rocks and stones. The most favorable soils for cultivation of grapes in terms of soil structure are those with granular structure whose grains range from 1 mm to 10 mm in size. Physical properties and chemical characteristics, as well as pH of soils determine their suitability for cultivation of vines. The most favorable pH values for development of vines are from 6 to 6.5, and a satisfactory growth and yield of grapes is achieved in pH values from the minimum of 5 to the maximum of 8.4. Physical and chemical properties of soil can be significantly improved by appropriate agro-technical measures.

Due to heterogeneity of its geological structure and influence of other pedogenetic processes, Bosnia and Herzegovina has a large number of types and subtypes of soil. According to general characteristics of soils, we can divide them into:

1. **Soil types suitable for viticultural production** (have very favorable properties or fewer limitations for viticultural production)

1. **Tla povoljna za vinogradarsku proizvodnju** imaju vrlo povoljna svojstva ili manja ograničenja za vinogradarsku proizvodnju. U takva tla ubrajaju se: aluvijalna tla (fluvisol), smeđa tla na krečnjaku (kalkambisol), humusno-karbonatno tlo (rendzina), eutrično smeđe tlo (eutrični kambisol).
2. **Tla potencijalno povoljna za vinogradarsku proizvodnju** uz agrotehničke mjere mogu se koristiti za vinogradarsku proizvodnju. U takva tla ubrajaju se: fluvijalno livadsko tlo (humofluvisol), smonica (vertisol), crnica na krečnjaku i dolomitu (kalkomelanosol), kiselo smeđe tlo (distrični kambisol), lesivirano tlo (luvisol).
3. **Tla nepovoljna za vinogradarsku proizvodnju** su ona na kojima vinogradarska proizvodnja nije moguća ili nije ekonomična. U takva tla ubrajaju se: glejno tlo, močvarno tlo (euglej, pseudoglej).

are: alluvial soils (Fluvisol), brown soils on limestone (Calcambisol), rendzinas (Humus-carbonate soil), eutric brown soil (Eutric Cambisol).

2. **Soil types potentially favorable for viticultural production** (can be used for production of grapes with agro-technical measures) are: Humofluvisol (fluvial meadow soil), smonica (Vertisol), black soil on limestone and dolomite (Calcomelanosol), acid brown soil (Dystric cambisol), loessivized soil (Luvisol).
3. **Soil types unfavorable for viticultural production** (soils on which grape production is not possible or not economical) are: gleyic soil, marshy soil, eugley, pseudogley.

Tablica 6**.** Tablični prikaz važnijih zahtjeva vinove loze za agroekološkim uvjetima uzgoja
Table 6. Tabular overview of the most important requirements of vines for agro-ecological cultivation conditions

	Čimbenici Factors	Uvjeti za vinovu lozu Conditions for grapevine	Napomena Note
T L O	**Dubina tla** **Soil depth**	30 – 60 cm	Zona razvoja glavnine korijena Principal root development zone
	Mehanički sastav **Mechanical stucture**	Laganija, pjeskovita, skeletna i tla na lesu s visokom mikrobiološkom aktivnošću Lighter, sandy, skeletal and soil on loess with high micro-biological activity	Glinovita tla su nepogodna. Plodna i duboka tla pridonose većoj bujnosti i rodnosti, ali lošijoj kakvoći uroda. Clayey soils are unfavorable. Fertile and deep soil contribute to greater vigor and productivity but poorer quality of crop.
S O	**pH-vrijednost tla** **Soil pH**	5 – 6	Ovisno o izboru podloge Depending on selection of rootstock
	Osjetljivost na vapno **Sensitivity to lime**	10 % – 40 %	Ovisno o izboru podloge Depending on selection of rootstock
I L	**Zahtjevi za hranjivima** **Nutrient requirements**	13 – 15 mg P_2O_5 na 100 g tla 13-15 mg P_2O_5 per 100 g of soil 20 – 40 mg K_2O na 100 g tla 20-40 mg K_2O per 100 g of soil 2 % – 3 % humusa 2-3% of humus	Nužni u malim količinama: Fe, Mn, B, Ca i Mg. Essential in small quantities: Fe, Mn, B, Ca and Mg

KLIMA CLIMATE	**Optimalna temp. rasta** **Optimum growth temperature**	12 ^{0}C – 25 ^{0}C	Srednja vegetacijska temperatura je 12 ^{0}C Average air temperature in vegetation is 12^{0}C
	Srednja godišnja **Average annual**	9 ^{0}C	Limitirajuća temperatura za uzgoj Limiting temperature for cultivation
	Apsolutna min. **Absolute min.**	-26 ^{0}C u trajanju 24 sata -26^{0} C lasting for 24 hours	Smrzava nadzemni dio trsa u mirovanju Above-ground part of vine is frozen in dormancy
	Apsolutna maks. **Absolute max.**	40 ^{0}C i viša 40^0 C and higher	Suše se dijelovi trsa, a ako traje više dana, i cijeli trs Parts of vine dry, and if lasting for several days the entire vine dries up
	Oborine **Precipitation**	600 – 800 mm godišnje 600 – 800 mm annually	
	Vjetrovi **Winds**	Smjer i jačina vjetra Direction and strength of wind	Definiraju smjerove pružanja redova Define row extending directions
	Insolacija **Insolation**	Bitna za odvijanje fotosinteze i nakupljanje šećera Important for progress of photosynthesis and accumulation of sugar	
	Geografska širina **Geographic latitude**	Umjereni pojas sjeverne i južne geografske širine Temperate zone of north and south geographic latitude	Između 42^0 i 45^0 sjeverne geografske širine Between 42 and 45^0 north geographic latitude
RELJEF RELIEF	**Nadmorska visina** **Altitude**	0 – 550 m nv 0 – 550 asl	Na našim prostorima In our areas
	Položaj i nagib (ekspozicija) **Position and gradient (exposition)**	Osunčani, nagnuti i ravni tereni južne i jugozapadne orijentacije Insolated, sloped and flat terrains of southern and southwestern orientation	

Rajonizacija vinogradarstva u Bosni i Hercegovini[1]

Marijo Leko

Rajonizacija vinogradarskih područja je utvrđivanje vinogradarskih zemljopisnih jedinica na temelju parametara klime, tla, topografije i čimbenika koji su pod izravnim utjecajem čovjeka kao što su: sorta, podloga, tehnologija proizvodnje, tradicija i drugo. Poznavanje rajonizacije je nužno zbog pravilnoga označavanja vina. Kvalitetna vina moraju nositi naziv vinogradarskoga rajona, vrhunska vina i vinogradarskog podrajona, vinogorja ili čak lokaliteta. Rajonizacija u poljoprivredi općenito predstavlja podjelu određena šireg teritorija na uža područja koja se međusobno razlikuju prema prirodnim i ekonomskim svojstvima. Rajonizacijom proizvodnje u vinogradarstvu utvrđuju se vinogradarske cjeline kao što su: rajon, podrajon, vinogorje i lokalitet.

Vinogradarski rajon je šire geografsko područje koje se odlikuje sličnim klimatskim, zemljišnim i ostalim uvjetima, nužnim za uspješan uzgoj vinove loze.

Vinogradarski podrajon je uže geografsko područje u okviru jednoga rajona u kojem se neki od agroekoloških čimbenika toliko razlikuju da dovode do većih razlika u prinosu i kakvoći grožđa i vina.

Vinogorje je osnovna vinogradarska kategorija u okviru podrajona koja u agroekološkom pogledu čini jednu vinogradarsku cjelinu. Za svako vinogorje definirane su skupine sorata i podloga koje najbolje odgovaraju agroekološkim uvjetima toga područja i koje će uz odgovarajuću tehnologiju proizvodnje dati najbolje proizvode.

Lokalitet je dio vinogorja koji se odlikuje ujednačenim agroekološkim uvjetima, tako da se u njemu proizvodi vino određene kakvoće.

1 Ovo je poglavlje temeljeno na elaboratu *Rejonozacija vinogradarstva Socijalističke Republike Bosne i Hercegovine* što ga je 1977. godine sačinio Institut za voćarstvo i vinogradarstvo Poljoprivrednoga fakulteta Sarajevo.

Zoning of viticulture in Bosnia and Herzegovina[1]

Marijo Leko

Zoning of viticultural areas is the determination of viticultural geographic units based on the parameters of climate, soil, topography and factors under direct human control such as variety, rootstock, production technology, tradition…. Knowledge of zoning is essential for proper labeling of wines; quality wines must bear the name of the wine-growing zone, premium wines also of the wine-growing subzone, wine-growing region or even location. In agriculture, zoning generally represents partitioning of a particular wider territory into narrower areas that differ in natural and economic characteristics. In viticulture, zoning establishes wine-growing units such as zone, subzone, wine-growing region and site.

A viticultural zone is a wider geographic area that is characterized by similar climatic, soil and other conditions, needed for successful cultivation of vines.

Wine-growing subzone is a narrower geographical area within a zone in which some of agroecological factors vary so much as to lead to major differences in yield and quality of grapes and wine.

Wine-growing region is the basic viticultural category within a subzone that constitutes one wine-growing unit in agroecological terms. Groups of cultivars and rootstocks that best suit agroecological conditions of the area and that will yield the best products with an appropriate production technology are defined for each wine-growing region.

Location is a part of a wine-growing region that is characterized by uniform agroecological conditions, so it produces a wine of a specific quality.

1 This chapter is based on the study Zoning of viticulture of the Socialist Republic of Bosnia and Herzegovina that was done in 1977 by the Institute for fruit-growing and viticulture of the Sarajevo Faculty of Agriculture.

Gotovo sva vinogradarska područja u svijetu obuhvaćena su rajonizacijom, a jedan od ciljeva je da se potrošači što bolje informiraju o proizvodu koji potječe iz pojedinoga područja. Po svojstvima vinogorja ili lokaliteta određuje se kakvoća vina. Rajonizacija kao zakonska odredba jamči da su točne informacije o proizvodu koje daje proizvođač.

U klimatskom pogledu Bosna i Hercegovina podijeljena je između tri klimatska područja: jadranskovisinska klima u dolini Neretve i Trebišnjice, srednjoeuropsko klimatsko područje obuhvaća ravničarski dio sjeveroistočne Bosne, te visinska klima koja obuhvaća područja središnje i zapadne Bosne i sjeverne Hercegovine. Današnje vinogradarstvo u Bosni i Hercegovini nalazi se gotovo isključivo u Hercegovini i to područja južne Hercegovine s Konjicom kao najsjevernijim dijelom. Dijelovi sjeverne Bosne koji su u prošlosti bili vinogradarska područja ostala su praktično bez vinove loze, iako bi prirodni uvjeti omogućavali proizvodnju vinove loze. To su zapravo potencijalna vinogradarska područja Bosne i Hercegovine. No u zadnje vrijeme se i na tim prostorima, od Une do Drine, sve više uzgaja vinova loza tako da je danas oko 100 ha zaposjednuto vinogradima.

Zoning covers almost all wine-growing areas in the world, and one of the aims is to better inform consumers about the product that originates from a particular area. Quality of wine is determined by characteristics of the wine-growing region or location. Zoning as a legal provision guarantees that information about the product given by the manufacturer is accurate.

In terms of climate, Bosnia and Herzegovina is divided into three climate regions: Adriatic high-altitude climate, the Neretva and Trebišnjica river valley, Central European climatic region includes the low-lying area of the northeastern Bosnia, and high-altitude climate that includes the areas of central and western Bosnia and northern Herzegovina. The present-day viticulture in Bosnia and Herzegovina is situated almost exclusively in Herzegovina, specifically in the area of southern Herzegovina with Konjic as the northernmost part. Parts of northern Bosnia that were wine-growing areas in the past are presently practically without grapevines, although the natural conditions would allow production of grapes. In fact, these are potential wine-growing areas of Bosnia and Herzegovina. But vines are lately increasingly grown in those areas too, from Una to Drina, so that today about 100 hectares are occupied with vineyards.

Program rajonizacije

Prema programu rajonizacije vinogradarstva Bosne i Hercegovine što ga je 1977. sačinio Poljoprivredni fakultet iz Sarajeva, Bosna i Hercegovina podijeljena je u dva rajona: rajon Hercegovine i rajon sjeverne Bosne. Hercegovački rajon prvobitno (Kuri, 1955.) je bio podijeljen u dva podrajona: južni i sjeverni. Južni podrajon bio je podijeljen u šest vinogorja: Mostarsko, Broćansko, Širokobriješko, Ljubuško, Dubravsko i Trebišnjičko. Sjeverni podrajon imao je samo jedno vinogorje, Konjičko-ramsko u području gornjega toka rijeke Neretve, a prostire se uz dolinu Neretve i Rame. Po novoj rajonizaciji rajon Hercegovine također je podijeljen u dva podrajona: podrajon srednje Neretve i Trebišnjice, što je zapravo južna Hercegovina, te podrajon Rame kao sjeverni rajon. S obzirom na klimatske i zemljišne uvjete podrajon srednje Neretve i Trebišnjice podijeljen je u dva vinogorja:

Zoning program

According to the Bosnian and Herzegovinan viticulture zoning program drafted by the Faculty of Agriculture from Sarajevo in 1977, Bosnia and Herzegovina is divided into two zones: the Herzegovina zone and the northern Bosnia zone. Herzegovinian zone was originally (Kuri, 1955) divided into two subzones, the southern and the northern one. The southern subzone was divided into six wine-growing regions: Mostar, Brotnjo, Siroki Brijeg, Ljubuski, Dubrava and Trebisnjica. The northern subzone had only one wine-growing region, Konjic-Rama in the upper course of the Neretva River, stretching along the Neretva and Rama valley. The new zoning too has divided the Herzegovina zone into two subzones: the subzone of the middle Neretva and Trebišnjica, which is actually the southern Herzegovina, and the subzone of Rama as the northern zone.

Mostarsko i Širokobriješko[2]. Mostarsko vinogorje obuhvaća cjelokupno vinogradarsko područje južne Hercegovine, osim Širokog Brijega i Gruda koje spadaju u Širokobriješko vinogorje. Takva podjela iako zastarjela još uvijek je u upotrebi pa ćemo se i mi njome služiti.

U sljedećem pregledu dat ćemo najvažnija svojstva pojedinih vinogorja.

Considering the climatic and soil conditions, the subzone of the middle Neretva and Trebisnjica is divided into two wine-growing regions: Mostar and Siroki Brijeg[2]. The Mostar wine-growing region covers the entire wine-growing area of southern Herzegovina, except Siroki Brijeg and Grude which fall under the Siroki Brijeg wine-growing region. This division although outdated is stil in use.

The next overview presents the most important characteristics of individual wine-growing regions.



Slika 24. Karta vinogorja u Bosni i Hercegovini
Figure 24. The map of wine growing regions of Bosnia and Herzegovina

2 U vrijeme pisanja elaborata o rajonizaciji ovo vinogorje nazvano je Lištičko, budući da se tada Široki Brijeg nazivao Lištica, a od 1990. godine toj općini vraćen je stari naziv Široki Brijeg.

2 At the time of writing, zoning refers to this wine-growing region as Lištica, since Siroki Brijeg was then called Listica, and from 1990 the name of the municipality was restored to Siroki Brijeg.

Podrajon Neretve i Trebišnjice

Mostarsko vinogorje

Termički koeficijent (K)	8,8
Heliotermički koeficijent (HTK_1)	5,9
Hidrotermički koeficijent (HTK)	1,5
Bioklimatski indeks (BK)	5,2
Temperaturna suma u vegetaciji ($^oC(t_v)$) (IV – X)	4.152 °C
Prosječna godišnja temperatura (t^o)	14,3 °C
Prosječna temperatura u vegetaciji (t^o_v)	19,4 °C
Dužina trajanja sunčeva sjaja (sati) (D)	2.290
Srednja dužina bezmrazna razdoblja (dana) (NF)	283
Prosječna godišnja visina oborina (u mm) (H)	1.434
Prosječna visina oborina u vegetaciji (mm) (H_v)	630

Neretva and Trebisnjica subzone

Mostar wine-growing region

Thermic coefficient (K)	8,8
Helio-thermic coefficient (HTK_1)	5,9
Hydro-thermic coefficient (HTK)	1,5
Bio-climatic index (BK)	5,2
Temperature sum in vegetation ($^oC(t_v)$) (IV – X)	4.152 °C
Mean annual temperature (t^o)	14,3 °C
Mean temperature in vegetation (t^o_v)	19,4 °C
Sunshine duration (hours) (D)	2.290
Mean duration of frost-free period (in days) (NF)	283
Mean annual precipitation (in mm) (H)	1.434
Mean precipitation in vegetation (mm) (H_v)	630



Slika 25. Vinogradi Mostarskog vinogorja
Figure 25. Vineyards of Mostar wine growing region

Najčešći tipovi vinogradarskih tala: crvenice, regosoli, rendzine, smeđa tla na laporu, aluvijalni nanosi, smeđa tla na krečnjaku.

U okviru Mostarskoga vinogorja postoji više lokaliteta: Kotlina (Mostar), Brotnjo, Ljubuški, Čapljina, Dubrava, Stolac, Popovo polje, Trebinje. Po staroj rajonizaciji to su bila vinogorja.

Širokobriješko vinogorje

Termički koeficijent (K)	5,1
Heliotermički koeficijent (HTK_1)	5,0
Hidrotermički koeficijent (HTK)	1,8
Bioklimatski indeks (BK)	4,5
Temperaturna suma u vegetaciji ($^oC(t_v)$) (IV – X)	3.837 °C
Prosječna godišnja temperatura (t^o)	12,9 °C
Prosječna temperatura u vegetaciji (t^o_v)	18,0 °C
Dužina trajanja sunčeva sjaja (sati) (D)	1.717
Srednja dužina bezmrazna razdoblja (dana) (NF)	205
Prosječna godišnja visina oborina (u mm) (H)	1.691
Prosječna visina oborina u vegetaciji (mm) (H_v)	685

Najčešći tipovi vinogradarskih tala: aluvijalni nanosi, crvenice.

Podrajon Rame

U podrajonu Rame je samo jedno, Jablaničko vinogorje, koje obuhvaća područje: Prozora, Jablanice i Konjica, što se nekada zvalo Konjičko-ramsko vinogorje. Jablaničko vinogorje je danas više povijesna kategorija i potencijalno vinogorje nego što je stvarno proizvodno područje. Nekada je Jablaničko vinogorje sudjelovalo s 15 – 20% u ukupnom vinogradarstvu Hercegovine, a danas na tom području ima tek nekoliko hektara, ali u posljednje vrijeme ima nekoliko pokušaja sadnje vinograda i revitalizacije vinogradarstva na ovom području. Udio jablaničkoga vinogorja u vinogradarskim površinama Hercegovine u pojedini razdobljima iznosio je: 1912. 14 %,

The most common types of vineyard soils: terra rossa, regosols, rendzinas, brown soils on marl, alluvial deposits, brown soils on limestone.

There are several locations within the Mostar wine-growing region: valley (Mostar), Brotnjo, Ljubuski, Capljina, Dubrava, Stolac, Popovo Polje, Trebinje. These were wine-growing regions by old zoning.

Siroki Brijeg wine-growing region

Thermic coefficient (K)	5.1
Helio-thermic coefficient (HTK_1)	5.0
Hydro-thermic coefficient (HTK)	1.8
Bio-climatic index (BK)	
Temperature sum in vegetation ($^oC(t_v)$) (IV – X)	3,837°C
Mean annual temperature (t^o)	12.9°C
Mean temperature in vegetation (t^o_v)	18.0°C
Sunshine duration (hours) (D)	1,717
Mean duration of frost-free period (in days) (NF)	205
Mean annual precipitation (in mm) (H)	1,691
Mean precipitation in vegetation (mm) (H_v)	685

The most common types of vineyard soils: alluvial deposits, terra rossa.

Rama subzone

The Rama subzone contains only one, Jablanica wine-growing region, covering the area of Prozor, Jablanica and Konjic, which used to be called Konjic-Rama wine-growing region. Nowadays, Jablanica wine-growing region is a historical category and potential wine-growing region rather than a real production area. Jablanica wine-growing region used to participate with 15-20% in the total viticulture of Herzegovina, while today the area has only a few hectares. However, recently there has been a number of attempts at planting vineyards and revival of viticulture in the area. In specific periods, proportions of Jablanica

1922. 21,7 % 1940., 18,6 %, a 1954. pao je na samo 1,6 %. Danas se na većem dijelu toga vinogorja nalazi Jablaničko jezero, pa je veći dio vinograda izgubljen izgradnjom akumulacijskoga bazena budući da su vinogradi bilu uz Neretvu i Ramu. Opisujući Konjic u svojim putopisima Evlija Čelebija piše da su uz Neretvu brojni vinogradi i vrtovi. To se vinogorje po svojim svojstvima bitno razlikuje od južnoga podrajona. Okruženo je visokim planinama, pa ima karakter kontinentalne klime.

Jablaničko vinogorje

Termički koeficijent (K)	1,0
Heliotermički koeficijent (HTK_1)	4,9
Hidrotermički koeficijent (HTK)	2,1
Bioklimatski indeks (BK)	3,8
Temperaturna suma u vegetaciji ($^oC(t_v)$) (IV – X)	3.799 °C
Prosječna godišnja temperatura (t^o)	12,4 °C
Prosječna temperatura u vegetaciji (t^o_v)	17,7 °C
Dužina trajanja sunčeva sjaja (sati) (D)	-
Srednja dužina bezmrazna razdoblja (dana) (NF)	162
Prosječna godišnja visina oborina (u mm) (H)	1.898
Prosječna visina oborina u vegetaciji (mm) (H_v)	797

Najčešći tipovi vinogradarskih tala: lesivirana tla, smeđa tla na krečnjaku, rendzine na dolomitu.

Rajon sjeverne Bosne

Rajon sjeverne Bosne obuhvaća područja uz rijeku Savu i podijeljen je u tri vinogorja: Kozaračko, Ukrinsko i Majevičko. Ta tri potencijalna vinogorja obuhvaćaju 486.000 ha obradivih površina, a u okviru njih postoji barem 50.000 ha površina na kojima bi se mogla uzgajati vinova loza. To znači da bi samo 10 % potencijalnih površina pod vinogradima u sjevernoj Bosni bilo više nego u cijeloj Hercegovini, što govori o velikim mogućnostima toga područja.

Kako bi se ovo provjerilo Poljoprivredni fakultet

wine-growing region in the wine-growing areas of Herzegovina were: 14% in 1912, 21.7% in 1922, 18.6% in 1940, while in 1954 it dropped to a mere 1.6%. Today, most of this wine-growing region is covered by the Jablanica lake, so most of the vineyards of this wine-growing region are lost by construction of the reservoir because the vineyards were situated along Neretva and Rama. Describing Konjic in his travelogues, Evliya Celebi wrote that there were numerous vineyards and gardens along Neretva. By its characteristics, this wine-growing region is substantially different from the southern subzone. It is surrounded by high mountains, so it is characterized by a continental climate.

Jablanica wine-growing region

Thermic coefficient (K)	1,0
Helio-thermic coefficient (HTK_1)	4,9
Hydro-thermic coefficient (HTK)	2,1
Bio-climatic index (BK)	3,8
Temperature sum in vegetation ($^oC(t_v)$) (IV – X)	3.799 °C
Mean annual temperature (t^o)	12,4 °C
Mean temperature in vegetation (t^o_v)	17,7 °C
Sunshine duration (hours) (D)	-
Mean duration of frost-free period (in days) (NF)	162
Mean annual precipitation (in mm) (H)	1.898
Mean precipitation in vegetation (mm) (H_v)	797

The most common types of vineyard soils: loessivized soils, brown soils on limestone, rendzinas on dolomite.

Northern Bosnia zone

The northern Bosnia zone includes areas along the Sava River and is divided into three wine-growing regions: Kozara, Ukrina and Majevica. These three potential wine-growing regions cover 486,000 ha of arable land, of which at least 50,000 ha are areas on which grapes could

u Sarajevu je u razdoblju od 1981. – 1986. kroz dva znanstvenoistraživačka projekta postavio pokusna polja na šest lokaliteta sjeverne Bosne s vinskim i stolnim sortama različitih epoha dozrijevanja. Po završetku projekta dobiveni rezultati pokazali su da se na tom širokom području vinova loza može uspješno uzgajati, isključujući sorte kasnih epoha dozrijevanja (Smederevka i neki interspecies hibridi) i one koje su osjetljive na niske temperature, kao što su Kardinal i Kraljica vinograda. Zahvaljujući provedenim istraživanjima sa standardnim sortama i interspecies hibridima loza se danas uspješno gaji na tom području.

Kozaračko vinogorje

Termički koeficijent (K)	-2,2
Heliotermički koeficijent (HTK_1)	3,7
Hidrotermički koeficijent (HTK)	2,1
Bioklimatski indeks (BK)	3,1
Temperaturna suma u vegetaciji ($^oC(t_v)$) (IV – X)	3.386,1 °C
Prosječna godišnja temperatura (t^o)	10,4 °C
Prosječna temperatura u vegetaciji (t^o_v)	15,7 °C
Dužina trajanja sunčeva sjaja (sati) (D)	1.748
Srednja dužina bezmrazna razdoblja (dana) (NF)	198
Prosječna godišnja visina oborina (u mm) (H)	1.205
Prosječna visina oborina u vegetaciji (mm) (H_v)	721

Najčešći tipovi vinogradarskih tala: aluvijalni nanosi, lesivirana tla, smeđe tlo na krečnjaku.

Ukrinsko vinogorje

Termički koeficijent (K)	-4,9
Heliotermički koeficijent (HTK_1)	4,0
Hidrotermički koeficijent (HTK)	1,6
Bioklimatski indeks (BK)	3,9
Temperaturna suma u vegetaciji ($^oC(t_v)$) (IV – X)	3.490,1°C

be grown. What it means is that a mere 10% of potential vineyard areas in the northern Bosnia would be more than the vineyards in the entire Herzegovina, which indicates high potentials of the area.

In order to verify this, the Faculty of Agriculture in Sarajevo set up field trials with wine and table varieties of different epochs of maturation through two scientific research projects at six sites in Bosnia in the period 1981-1986. Upon completion of the project the results showed that in this broad region vines can be successfully cultivated, excluding late ripening varieties (Smederevka and some interspecific hybrids) and those that are sensitive to low temperatures, such as Kardinal and the Kraljica vinograda. Thanks to the research conducted with standard varieties and interspecific hybrids vines are now successfully grown in this area.

Kozara wine-growing region

Thermic coefficient (K)	-2,2
Helio-thermic coefficient (HTK_1)	3,7
Hydro-thermic coefficient (HTK)	2,1
Bio-climatic index (BK)	3,1
Temperature sum in vegetation ($^oC(t_v)$) (IV – X)	3.386,1 °C
Mean annual temperature (t^o)	10,4 °C
Mean temperature in vegetation (t^o_v)	15,7 °C
Sunshine duration (hours) (D)	1.748
Mean duration of frost-free period (in days) (NF)	198
Mean annual precipitation (in mm) (H)	1.205
Mean precipitation in vegetation (mm) (H_v)	721

The most common types of vineyard soils: alluvial deposits, loessivized soils, brown soils on limestone.

Ukrina wine-growing region

Thermic coefficient (K)	-4,9
Helio-thermic coefficient (HTK_1)	4,0

Prosječna godišnja temperatura (t°)	10,6 °C
Prosječna temperatura u vegetaciji ($t°_v$)	16,3 °C
Dužina trajanja sunčeva sjaja (sati) (D)	1.700
Srednja dužina bezmrazna razdoblja (dana) (NF)	206
Prosječna godišnja visina oborina (u mm) (H)	939
Prosječna visina oborina u vegetaciji (mm) (H_v)	570

Najčešći tipovi vinogradarskih tala: aluvijalni nanosi, lesivirana tla, smeđe tlo na krečnjaku.

Majevičko vinogorje

Termički koeficijent (K)	-2,6
Heliotermički koeficijent (HTK_1)	3,9
Hidrotermički koeficijent (HTK)	1,5
Bioklimatski indeks (BK)	4,3
Temperaturna suma u vegetaciji ($°C(t_v)$) (IV – X)	3.456,6 °C
Prosječna godišnja temperatura (t°)	10,5 °C
Prosječna temperatura u vegetaciji ($t°_v$)	16,1 °C
Dužina trajanja sunčeva sjaja (sati) (D)	1.764
Srednja dužina bezmrazna razdoblja (dana) (NF)	182

Hydro-thermic coefficient (HTK)	1,6
Bio-climatic index (BK)	3,9
Temperature sum in vegetation ($°C(t_v)$) (IV – X)	3.490,1 °C
Mean annual temperature (t°)	10,6 °C
Mean temperature in vegetation ($t°_v$)	16,3 °C
Sunshine duration (hours) (D)	1.700
Mean duration of frost-free period (in days) (NF)	206
Mean annual precipitation (in mm) (H)	939
Mean precipitation in vegetation (mm) (H_v)	570

The most common types of vineyard soils: alluvial deposits, loessivized soils, brown soils on limestone.

Majevica wine-growing region

Thermic coefficient (K)	-2,6
Helio-thermic coefficient (HTK_1)	3,9
Hydro-thermic coefficient (HTK)	1,5
Bio-climatic index (BK)	4,3
Temperature sum in vegetation ($°C(t_v)$) (IV – X)	3.456,6 °C
Mean annual temperature (t°)	10,5 °C
Mean temperature in vegetation ($t°_v$)	16,1 °C



Slika 26. Vinograd u sjevernoj Bosni
Figure 26. Vineyard in northern Bosnia

Prosječna godišnja visina oborina (u mm) (H)	841
Prosječna visina oborina u vegetaciji (mm) (H_v)	516

Najčešći tipovi vinogradarskih tala: aluvijalni nanosi, lesivirana tla, smeđe tlo na krečnjaku.

Usporedni klimatski elementi pokazuju da u svakom vinogorju postoje mogućnosti za uzgoj vinove loze pa se uz odgovarajući izbor sorte i podloge i adekvatnu tehnologiju proizvodnje u njima može razviti vinogradarstvo. No na kraju treba dodati da su klimatski podaci za postojeću rajonizaciju praćeni od 1961. do 1972. godine, a podaci zadnjih desetak godina pokazuju da su klimatski uvjeti za vinogradarstvo povoljniji nego ranije.

Na kraju valja reći da je postojeća rajonizacija rađena 1977. godine, kada su gospodarske, društvene i političke prilike bilo bitno drukčije nego danas, zastarjele i prevladane. Osim toga postoje indicije da su se dogodile i stanovite klimatske promjene. Zbog svega toga pokrenuta je inicijativa za njeno revidiranje u cilju boljeg prilagođavanja postojećem stanju.

Sunshine duration (hours) (D)	1.764
Mean duration of frost-free period (in days) (NF)	182
Mean annual precipitation (in mm) (H)	841
Mean precipitation in vegetation (mm) (H_v)	516

The most common types of vineyard soils: alluvial deposits, loessivized soils, brown soils on limestone.

Comparative climatic elements indicate that there is a possibility for cultivation of vines in each of the wine-growing regions, and so viticulture can be developed in them with the appropriate selection of cultivars and rootstocks and adequate production technology. It should be added that the climatic data for the existing viticulture zoning were followed from 1961 to 1972, and the data in the last ten years show that the climatic conditions for viticulture are better than were before.

It should be finally said that the existing zoning was made in 1977, when economic, social and political circumstances were substantially different than today, outdated and overcome. In

Tablica 7. Najvažniji elementi klime vinogorja u Bosni i Hercegovine
Table 7. The most important elements of climate of wine-growing regions in Bosnia and Herzegovina

Rajon/ vinogorje Zone/wine-growing region	Klimatski elementi – Climate elements										
	t^o	t^o_v	$^oC(t_v)$	D	NF	H	H_v	K	HTK_l	HTK	BK
Rajon Hercegovine – Herzegovina zone											
Mostarsko	14,3	19,4	4.152	2.290	283	1.434	630	8,8	5,9	1,5	5,2
Širokobriješko	12,9	18,0	3.837	1.717	205	1.691	685	5,1	5,0	1,8	4,5
Jablaničko	12,4	17,7	3.799	n.a.	162	1.898	797	1,0	4,9	2,1	3,8
Rajon sjeverne Bosne - Northern Bosnia zone											
Kozaračko	10,4	15,7	3.386	1.748	198	1.205	721	-2,2	3,7	2,1	3,1
Ukrinsko	10,6	16,3	3.490	1.700	206	939	570	-4,9	4,0	1,6	3,9
Majevičko	10,5	16,1	3.457	1.764	182	841	516	-2,6	3,9	1,5	4,3

addition, there are indications that certain climatic changes have also taken place. For all these reasons, the initiative for its revision has been launched in order to achieve its better adjustment to the existing situation.

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VINARSTVO KROZ STOLJEĆA DO DANAS

Tihomir Prusina

Vino – božansko piće muza slikara, kipara, glazbenika, književnika, umjetnika. Vino – najhigijenskije piće ikada proizvedeno. Vino – umjetničko djelo nastalo skladnim radom prirode, trsa i čovjeka. Vino – poljoprivredno prehrambeni proizvod dobiven potpunim ili djelomičnim vrenjem svježega, zdravog, zrelog grožđa europske plemenite vinove loze *Vitis vinifera L*. Ali i vino – često nepravedno povezano s alkoholizmom. Ni jedno drugo piće nije toliko godina vezano uz tu bolest kao vino. Pretpostavka je kako je uzrok tomu nepoznavanje toga prirodnoga prehrambenog poljoprivrednog proizvoda.

Hipokrat, otac medicine, vino opisuje kao korisno sredstvo među ostalima i za poboljšanje rada bubrega te psihičkoga stanja općenito. Platon navodi kako umjerena konzumacija vina daje snagu, pomlađuje tijelo i um. Ciceron pak tvrdi kako vino potiče misaone procese i stvara inspiraciju. Sveti Pavao u svojoj epistoli Timoteju savjetuje ne piti čistu vodu, nego u posudu s vodom dodati vino jer blagotvorno djeluje za želudac, a odlična je zaštita od bakterija. Louis Pasteur je rekao: *Vino je najzdraviji napitak*.

Usprkos svemu medicina vino ne može svrstati u skupinu lijekova, što je i opravdano, no brojna znanstvena istraživanja nedvosmisleno dokazuju blagotvornost umjerene konzumacije vina. Blagotvornost djelovanja vina posebno je izražena kroz njegova nutritivna svojstva što je i priznato novim Zakonom o vinu gdje se vino tretira kao prehrambeni proizvod. Vino, osim toga ima gastronomsko značenje jer utječe na apetit, probavu i daje osjećaj ugode. Nezamisliv je kvalitetan i kompletan obrok u Hercegovini bez čaše dobra vina, što pokazuje nedvojbenu ulogu

WINEMAKING THROUGH CENTURIES UP TO THIS DAY

Tihomir Prusina

Wine - the divine drink of muses, painters, sculptors, musicians, writers, artists. Wine - the most hygienic drink ever produced. Wine - artwork created by harmonious work of nature, vine and man. Wine - agricultural food product obtained by complete or partial fermentation of fresh healthy, ripe grapes of the European cultivated vine *Vitis vinifera L*. But also wine - often unjustly related to alcoholism. No other drink has been associated with this illness for so many years as wine. That is presumably caused by unfamiliarity with this natural agricultural foodstuff.

Hippocrates, the father of medicine, describes wine as a useful means, among other things, also for improvement of the kidney function and state of mind in general. Plato states that moderate consumption of wine gives strength, rejuvenates the body and mind. Cicero in turn claims that wine stimulates thinking processes and creates inspiration. St. Paul in his Epistle to Timothy advised not to drink clean water, but to add wine in a pot with water as it has a beneficial effect for stomach, and it is an excellent protection against bacteria. Louis Pasteur said: „Wine is the healthiest drink".

Nevertheless, medicine cannot classify wine into the group of drugs, which is justified, but numerous scientific studies clearly prove beneficial effects of a moderate consumption of wine. Beneficial effects of wine are particularly expressed through its nutritional properties, which is acknowledged by the new Wine Act where wine is treated as a foodstuff. In addition, wine has a gastronomic significance because it has an influence on appetite, digestion and gives a feeling of comfort. A high-quality and full meal in Herzegovina is unimaginable without a glass of good wine, which



Slika 27. U starom podrumu
Figure 27. In an old cellar

vina kao prehrambenoga proizvoda. Vino nosi sva svojstva ljudske hrane: vitamine, minerale, bjelančevine, kiseline, šećere, dušične spojeve, tvari koje sadrže kemijski vezanu energiju. Svrstavanjem vina u prehrambene proizvode napravio se veliki korak u promidžbi te plemenite kapljice, ali i na unapređenju kulture pijenja vina kao pića blagotvorna zdravstvenoga djelovanja (Marić i sur. 2002.).

indicates the definite role of wine as a foodstuff. Wine has all the characteristics of human food - vitamins, minerals, proteins, acids, sugars, nitrogen compounds - substances containing chemically bound energy. Classifying wine into foodstuffs has made a big step in promotion of good wine, but also in promotion of the culture of drinking wine as a drink of beneficial health effects (Maric et al., 2002).

Povijesni pregled

Historical overview

Početak i uspon

Razvoj vinogradarstva i vinarstva na našim prostorima počinje u vrijeme Rimskoga Carstva o čemu svjedoče nadgrobni spomenici i ostali fragmenti iz toga doba čiji reljefi oslikavaju prizore iz berbe grožđa, motive loze i grozdova, kao i posuda za čuvanje i serviranje vina.

Ostaci portala na ulazu rimskoga utvrđenog logora *Mogorjelo* kod Čapljine (iz vremena cara Augusta Oktavijana) nose uklesane grozdove i

The beginning and rise

The development of viticulture and winemaking in our region begins in the time of the Roman Empire, which is witnessed by tombstones and other fragments from those times, whose reliefs depict scenes of grape harvest, motifs of vines and bunches, as well as containers for storing and serving wine.

Remains of a portal at the entrance of the Roman fortified camp Mogorjelo near Capljina

druge vinogradarske ornamente, kao simboličan dokument o tisućljetnoj tradiciji uzgoja vinove loze. Autor knjige *Turistički motivi i objekti u Hercegovini* (Mihić, 1968.) govoreći o Mogorjelu između ostalog kaže: *Na sjeverozapadnom dijelu dvorišta vidimo ostatke zgrade za poljoprivrednu proizvodnju, tzv. Villa rustica fructicaria* (...) i nastavlja: *Unutar te zgrade stajao je magacin hrane, vinara, uljara, mlin i pekara. Ovdje su interesantne velike zemljane bačve (dolia), za ostavu vina* (…).

Na intenzivno poljodjelstvo, posebice vinogradarstvo, a moguće i maslinarstvo, upozorava i baza rimskoga tijeska (*torculum*), pronađena u ruševinama antičkoga objekta na Crkvini (Bojanovski, 1969.). Tijesak se vjerojatno koristio kako za tiještenje masulja, tako i za tiještenje maslina, a danas se nalazi kod župne crkve u Čerinu.

(from the time of Emperor Augustus Octavian), feature engraved grapes and other wine-growing ornaments, as a symbolic document on the millennia-old tradition of vine cultivation. In his book "Tourist motifs and objects in Herzegovina", Mihic (1968), speaking of Mogorjelo, among other things, says: "In the northwestern part of the yard we see remnants of a building for agricultural production, the so-called Villa rustica fructicaria... ", and continues:" Within the building there were a food storage, winery, oil works, mill and bakery. Here are some interesting large earthen vases (dolia), for storage of wine .... "

Intensive agriculture, especially wine-growing, and maybe also olive-growing, are heralded by the base of a Roman press (*torculum*), found in remnants of an antique structure at Crkvina (Bojanovski, 1969). The press was probably used both for pressing marc and for pressing olives, and today it is found near the parish church in Cerin.



Slika 28. Postolje prese za vino, Čerin 3. stoljeće
Figure 28. Pedestal of wine press, Cerin, 3rd century

Tragovi antičkoga naselja s ulomcima amfora registrirani su na Krstini u Hamzićima, a upućuju na razvijeno vinogradarstvo i vinarstvo toga kraja (AL BiH, 1988.).

U srednjovjekovnoj Europi, nakon pada Rima, Kršćanska crkva postala je bitan čimbenik u vinogradarstvu i vinarstvu. Vino postaje neizostavan dio slavljenja misa. Istodobno, vino postaje zabranjeno u islamskoj kulturi. Uzgoj grožđa i proizvodnja vina postupno se povećavaju, kao i potrošnja od 15. stoljeća.

U razdoblju nakon propasti Zapadnoga Rimskog Carstva do turske okupacije dolazi do velike seobe naroda i dolaska Slavena na naše prostore. Slaveni su bili dobri zemljoradnici koji su vinovu lozu kao kulturu zatekli u našem kraju, te se može zaključiti da su je jako brzo naučili uzgajati, proizvoditi vino i uživati u njemu. Iz toga razdoblja nema važnijih arheoloških nalazišta osim stećaka koji datiraju između 13. i 15. stoljeća, a često kao motive imaju mladice i grozdove vinove loze kao i druge motive iz života pokojnika.

Iz toga razdoblja o dobrim vinima iz našega kraja govori i Povelja bana Tvrtka koji u samom početku svoga banovanja dolazi 1353./1354. godine u Brotnjo s rodbinom, bratom Vukom i pratnjom. Svjedoči o tome jedna povelja, koja se čuva u Dubrovniku, koju je pisao Draživeslav, dvorski pisac i dijak bana Tvrtka, a koja završava riječima: *I kada ovo pisah, tada mi dade gospodin ban Tvrtko ispred sebe velik pehar vina popiti u dobru volju*. U povelji se također veli da je pisana *u Suhoj na Prozračcu*. Arheolozi i povjesničari pretpostavljaju da je Prozračac, koji se smješta u Brotnjo, bio u srednjem vijeku u posjedu knezova Komlinovića. O tome govori natpis iz 15. stoljeća na nadgrobnom spomeniku kneza Pavla Komlinovića na lokaliteta Visočica (Bakri) u Donjoj Blatnici (Vego, 1981.).

Stagnacija u vrijeme osmanlijske vlasti

U vrijeme turske okupacije naših prostora ne bi se moglo reći da je uzgoj vinove loze bio ograničen, osim što je iz vjerskih razloga uvedena prilično visoka trošarina na vino. No u to vrijeme se promijenila struktura potrošnje, više se proizvodilo grožđe kao zobatica za konzumiranje u svježem

Traces of an ancient settlement with fragments of amphorae are registered at Krstina in Hamzici, indicating developed wine-growing and winemaking of this area (AL BiH, 1988).

In medieval Europe, after the fall of Rome, the Christian Church became an important factor in viticulture and winemaking. Wine became an indispensable part of celebration of masses. At the same time, wine became forbidden in the Islamic culture. Cultivation of grapes and production of wine gradually increased, and so did consumption from the 15th century.

In the period after the fall of the Western Roman Empire until the Ottoman occupation, the great migration of peoples occurred and the Slavs came to our region. The Slavs were good farmers who found grapevine as a crop in our region, and we can conclude that they very quickly learned how to cultivate it, produce wine and enjoy it. There are no significant archaeological sites from that period except standing tombstones dating between the 13th and 15th centuries, and often as motives they have shoots and bunches of grapevine and other motifs from lives of the deceased.

From this period, fine wines from our region are also mentioned in the Charter of Ban Tvrtko who came to Brotnjo in 1353/1354 at the very beginning of his banship with relatives, his brother Vuk and escort. That is testified in a charter that is kept in Dubrovnik, which was written by Drazeslav, court writer and student of Ban Tvrtko, and which ends in words: “And as I have written this, then Sir Ban Tvrtko gave me a large cup of wine in front of me to drink in good will.” It is also written in the charter that it was written “in Suha on Prozracac.” Archaeologists and historians assume that Prozracac, which is placed in Brotnjo, was in the Middle Ages owned by the princes Komlinovices. That is confirmed by an inscription from the 15th century on the tombstone of Prince Pavle Komlinovic at the site Visocica (Bakri) in Donja Blatnica (Vego, 1981).

Stagnation in the time of the Ottoman rule

In the time of Turkish occupation of our area, it could not be said that cultivation of vines was limited, except that a fairly high excise on wine



Slika 29. Buklija, stara drvena posuda za vino
Figure 29. Buklija, the old wooden bottle for wine

stanju. Kako je stagnirala proizvodnja vinskih sorata grožđa, tako je stagniralo i podrumarstvo. Srednjovjekovni samostani i manastiri u Bosni i Hercegovini također su imali vinograde i podrume. U jednoj srpskoj narodnoj pjesmi govori se o napadu Turaka na manastir Tvrdoš kod Trebinja, a o manastiru jedan stih kaže: *Izbe su im prepunjene vinom*. To je vjerojatno prvo spominjanje nekoga vinskog podruma u Bosni i Hercegovini.

Vino iz Brotnja u vrijeme osmanske vlasti spominje biskup fra Marijan Lišnjić u svom izvješću s puta po Brotnju iz 1668. godine. Vino se iz Brotnja prodavalo u Bosnu, a potrošači su uglavnom bili franjevački samostani. Tako u ljetopisu franjevačkoga samostana u Kreševu, vino iz Brotnja spominje se više puta od 1765. do 1771. godine (Jelenić, 1917.). Ivan Frano Jukić (1818. – 1857.), poznati franjevac posebno ističe vina Mostarac i Broćanac. Svi oni pišu o hercegovačkom vinu iz vlastita iskustva ili prenose priče iz druge ruke.

Prema dostupnim podacima prve veće i nešto

was introduced for religious reasons. However, the consumption structure changed in that time, grapes were produced more as table grapes for consumption in fresh condition. As the production of wine grape varieties stagnated, so stagnated winemaking too. Medieval monasteries in Bosnia and Herzegovina also had vineyards and cellars. One Serbian folk song speaks about an attack of the Turks on the monastery Tvrdos near Trebinje, and one verse says about the monastery: “their rooms are overfilled with wine.” That is probably the first reference to a wine cellar in Bosnia and Herzegovina.

In the time of the Ottoman rule, wine from Brotnjo was mentioned by Bishop Marijan Lisnjic in his report from his journey in Brotnjo in 1668. Wine from Brotnjo was sold in Bosnia, and the consumers were mainly Franciscan monasteries. Thus, wine from Brotnjo is mentioned several times in the chronicle of the Franciscan Monastery in Kresevo from 1765 to 1771 (Jelenic, 1917).

Ivan Frano Jukic (1818 - 1857), the well-known Franciscan, especially emphasizes the wines

opremljenije i kvalitetnije vinske podrume u vrijeme osmanske uprave opet su osnovali svećenici. Jedan od njih je pop glagoljaš don Jure Stojić (1743. – 1802.), koji je imao relativno dobar podrum u svojoj kući u selu Dragićini u općini Čitluk. Dragićina je cijelo vrijeme osmanske vlasti imala razvijeno vinogradarstvo, što se vidi iz česta spominjanja vinograda u sidžilu mostarskoga kadije. Drugi nešto veći i bolji podrum izgradio je 1861. poznati franjevac fra Petar Bakula u župnoj kući u selu Gradnići, općina Čitluk, a danas je taj podrum obnovljen.

U vrijeme turske vlasti u gradovima i na važnijim putovima postojali su tzv. hanovi, odnosno svratišta za putnike. Ali kako su vlasnici hanova bili uglavnom muslimani u njima se nije točio alkohol. Tek kad se počinju otvarati krčme po gradovima, počinje se u njima služiti alkohol. Vlasnici krčama bili su uglavnom pravoslavci (Krešević, 1949.).

Početak modernoga podrumarstva

U vrijeme Austro-Ugarske Monarhije vinogradarstvo Francuske je dospjelo u tešku krizu zbog pojave trsnoga ušenca (filoksere). Nova vlast tada nalazi veliki interes za sadnju vinograda i proizvodnju vina u Hercegovini i počinje ubrzani razvoj vinogradarstva i podrumarstva. Hercegovci su oduvijek bili dobri vinogradari, a sve do dolaska Austro-Ugarske nije bilo dobrih podrumara, odnosno vina nisu bila zadovoljavajuće kakvoće. Vino je većinom odležavalo u hrastovim bačvama, nije bilo zaštićeno (sulfitirano), niti nadolijevano nakon završetka fermentacije. Bačve su bile otvorene sve do Dušnoga dana kada bi se tek kušala mlada vina i nakon toga zatvarale bačve. Za mnoga je vina to bilo prekasno jer su već nastupile mane poput mirisa na pokvarena jaja, oksidacija i bolesti vina: octikavost, vinski cvijet i itd. Zato se odmah pristupilo ispitivanju svojstava i kakvoće hercegovačkih vina.

Da bi unaprijedila vinogradarstvo i vinarstvo u Bosni i Hercegovini, Austro-Ugarska je osnovala dvije voćarsko-vinogradarske stanice u Hercegovini, u Gnojnicama kod Mostara (1888.) i Lastvi kod Trebinja (1894.), te jednu u Derventi (1888.) za područje sjeverne Bosne. Na

Mostarac and Brocanac. They all write about Herzegovinian wine from their own experience or pass along stories indirectly.

According to available data, first larger and somewhat more equipped and higher-quality cellars at the time of the Ottoman rule were again established by priests. One of them is the Glagolitic priest, Father Jure Stojic (1743 - 1802), who had a relatively good cellar in the second half of 18. century in his house in the village of Dragicina in Citluk municipality. During the entire period of Ottoman rule, Dragicina had a developed viticulture, which is evident from frequent references to vineyards in the court records of the Mostar qadi. The second to a degree larger and better cellar was built in 1861 by the well-known Franciscan, Father Petar Bakula, in the parish house in the village of Gradnici, Citluk municipality, and these days that cellar is reconstructed.

During the Ottoman rule, there were so-called hans (karavanserais) or hostels for passengers in towns and on important roads. But, as owners of hans were mainly the Muslims, alcohol was not sold in them. It is only when inns started being opened in towns that alcohol began to be served in them. The owners of inns were mainly the Orthodox (Kresevljakovic, 1949.).

Beginning of the modern winemaking

During the Austro-Hungarian Empire, winemaking in Europe fell into a serious crises due to occurrence of phylloxera. The new authorities then found a great interest in planting vineyards and production of wine in Herzegovina and started a rapid development of wine-growing and winemaking. Herzegovinians were always good wine-growers, and until the arrival of Austria - Hungary there were no good wine-makers, i.e. the quality of wines was not satisfactory. Wine was mostly aged in oak barrels, it was not protected (sulfited), or filled up after completion of fermentation. Barrels were open until All Souls' day when new wines would be tasted and subsequently barrels were closed. For many wines, that was too late because there were already flaws, such as the smell of rotten eggs, oxidation and wine diseases: acetification, wine

tim stanicama ispitivane su najvažnije domaće sorte, ali i neke strane sorte koje bi se mogle udomaćiti u našem podneblju. Tu su počeli i prvi pokusi s francuskom sortom Alicante Bouschet (Kambuša) kao pratećom sortom Blatine. Ta se sorta tako prilagodila na našem području da je nakon 120 godina uzgoja postala skoro domaća hercegovačka sorta.

Istodobno s unapređenjem vinogradarstva, austrougarska vlast počela je raditi i analize naših vina. Samo nekoliko godina nakon okupacije izvršene su prve analize vina iz Hercegovine i Bosne. Analize je proveo dr. Leonard Roesler iz poznate vinogradarske škole u Klosterneuburgu (Roesler, 1888.).

Roesler je analizirao vina iz Bosne (Prozor) i Hercegovine (Mostar, Stolac, Konjic i Popovo polje) proizvedena 1883. godine. Za vina iz Bosne Roesler piše da se grožđe ne preša, nego stoji 8 – 10 dana, sve dok se sok ne ocijedi. Nakon toga vino dospijeva u bačve koje katkad nisu začepljene nakon čega se vino pretače čim se može piti. Vino se treba potrošiti do iduće berbe. Starijih vina u biti nije bilo. Ne postoje podrumi i podrumska gospodarstva. U tom području Roesler

flowers... That is why testing of properties and quality of Herzegovinian wines was promptly undertaken.

To promote viticulture and winemaking in Bosnia and Herzegovina, Austria - Hungary established three fruit and wine growing stations in Herzegovina, in Gnojnice near Mostar (1886) and Lastva near Trebinje (1894), as well as one in Derventa (1888) for the area of northern Bosnia. These stations tested the most important local cultivars, but also some foreign cultivars that could be domesticated in our terroir. That is where the first tests of the French variety Alicante bouschet (Kambusa), as the variety supporting Blatina, started. This variety has adapted to our area so well that after 120 years of cultivation it has become almost a local variety in Herzegovina.

Alongside with improvement of viticulture, Austria - Hungary also started conducting analyses of local wines. First analyses of wines from Herzegovina and Bosnia started only several years after the occupation. The analyses were performed by Dr. Leonard Roesler from the renowned wine-growing school in Klosterneuburg (Roesler, 1888).



Slika 30. Vinogradarska i vinarska škola u Klosterneuburgu
Figure 30. Viticulture and wine school in Klosterneuburg

spominje sorte Skadarka, Slatina, Zelenka, Podbjel i Krkošija koja je izrazito zastupljena.

Roesler analyzed wines from Bosnia (Prozor) and Herzegovina (Mostar, Stolac, Konjic and Popovo polje) produced in 1883. About wines

Za vina iz Hercegovine Roesler ima sasvim drugu ocjenu. Bijela vina su većinom suha, jaka, puna okusa, uobičajena boja je smeđožuta. Nešto su opora, mnoga su cvjetna mirisa i podsjećaju u svim tim stavkama na bolja bijela vina Dalmacije. Nigdje se ne pojavljuju kiseline. Roesler piše da kotari Mostar i Stolac spadaju u područja u kojima bijela vina mogu ležati pod opnom ako ne postanu opora i previše tamna. Što se tiče crnih vina, ona nisu međusobno slična kao što su bijela. Uzorci vina iz područja Cima pokazala su se kao tamnocrvena vina odgovarajuće oporosti, puna okusa i sve u svemu kao dobra crna vina koja su dosta slična dalmatinskim crnim vinima. Isto tako može se naglasiti da takva vina dosežu intenzitet u boji, a da ne posjeduju oporost. Slična vina su također zabilježena u cijelom mostarskom kotaru. Pojedina crna vina posjeduju vlastiti okus koji bi mogao potjecati od sorte grožđa i jednim dijelom podsjeća na fini okus plodova određenih mladih, finih sorata iz Bordeauxa. S druge strane također se čini kao da postoji srodnost s crnim ribizlama što odlučujuće podiže kakvoću vina.

Vina iz Trebinja i Konjica se mogu pribrojiti laganim, svijetlim crnim vinima, koja su bliska vinima Schiller (naziv crvenkasta vina koje se dobije miješanjem crnoga i bijeloga grožđa). Ta vina nisu prejaka i male su oporosti i pomalo su kiselkasta okusa. Ne posjeduju neku posebnu kakvoću, ali ako se dobro čuvaju mogu poslužiti kao stolna vina za lokalnu konzumaciju (Roesler, 1888.). Analize iz 1888. godine pokazale su da su mutna vina i neujednačene kakvoće zbog loše njege.

Drugu, veoma opširnu ocjenu kakvoće hercegovačkih vina sačinio je Carl Neufeld 1901. godine, na uzorcima vina iz 1898. i 1899. Ukupno je uzeto 43 uzorka crnoga vina i 35 uzoraka bijeloga vina, najviše iz Mostara i Lastve, 15 uzoraka crnoga i 14 uzoraka bijeloga vina. Odmah na početku svoga izvješća Neufeld uspoređuje stanje vinogradarstva i podrumarstva s onim kakvo je Roesler zatekao nakon okupacije. Neufeld ističe kako je u proteklih 15 – 20 godina vinogradarstvo i proizvodnja vina u Hercegovini doživjela snažan napredak. Roesler je tada opisao velike nedostatke u podrumskim gospodarstvima tamošnjih krajeva, dok je u analizama Neufelda *znatan broj ispitanih primjeraka pokazao*

from Bosnia, Roesler writes that grapes are not pressed, but left for 8 - 10 days until the juice drains. After that, wine reached barrels that were sometimes not plugged, after which wine was poured off as soon as it could be drunk. Wine was to be used up by the next harvest. There were essentially no old wines. Cellars and cellar farms did not exist. In this area, Roesler mentions the varieties Skadarka, Slatina, Zelenka, Podbjel and Krkosija which is highly predominant.

Roesler has an entirely different evaluation for wines from Herzegovina. White wines were mostly dry, strong wines, of full taste, the usual color was brownish yellow. They were slightly sharp, many had a flowery smell and in all these elements were reminiscent of better white wines of Dalmatia. Acids did not appear anywhere. Roesler writes that districts of Mostar and Stolac belonged to areas where white wines may lie under membrane if they do not become dry and too dark. As far as red wines are concerned, they were not so similar to each other like white ones. Wine samples from the area of Cim were found to be dark red wines with appropriate dryness, full taste and all in all like good red wines that were rather similar to dalmatian red wines. Likewise, it can be emphasized that such wines reach intensity in color, but they do not have dryness. Similar wines were also registered in the entire Mostar district. Some red wines had their own flavor that could originate from the grape variety and was partly reminiscent of the fine taste of fruits of certain young, fine varieties from Bordeaux. On the other hand it also seemed as if there was a similarity with black currants, which crucially raised the quality of wine.

Wines from Trebinje and Konjic could be counted among light, bright red wines, that were close to Schiller wines (name of the reddish wine that was produced by mixing red and white grapes). These wines were not too strong and had low dryness and their taste was slightly acid. They did not have any special quality, but if preserved well they could be used as table wines for local consumption (Roesler, 1888). Analyses from 1888 showed that wines were turbid and in uneven quality due to poor care.

The other, very extensive evaluation of the quality of Herzegovinian wines was made by

iznimnu kakvoću koja ulijeva nadu da će se vinogradarstvo, ali puno više od toga podrumsko gospodarstvo tamošnjih zemalja uskoro moći podići na takvu razinu koja će omogućiti da se takav dobiveni prirodni proizvod preobrazi u trajni i vrijedni trgovački artikal. Takvo stanje i postignutu razinu Neufeld pripisuje mjerama Zemaljske vlade BiH kojima se uspjelo educirati jedan veći broj vinogradarskoga stanovništva modernoj pripremi vina *čiji proizvodi već danas mogu konkurirati najboljima na tržištu*. *Bolje hercegovačke vinske sorte postale su posve važna trgovačka roba čim su postale poznate u širim krugovima*, piše Neufeld. Također ističe da priprema hercegovačkih vina počiva gotovo isključivo u rukama većih vinogradara koji za vlastitu proizvodnju dokupljuju grožđe ostalih vinogradara.

Carl Neufeld in 1901, and on wine samples from 1898 and 1899. Totally 43 samples of red wine and 35 samples of white wine were taken, mostly from Mostar and Lastva, 15 samples of red and 14 samples of white wine. Right at the very beginning of his report, Neufeld compared the state of wine-growing and winemaking with one that Roesler had found after the occupation. Neufeld stressed that viticulture and production of wine made a great progress in Herzegovina over the past 15 - 20 years. Roesler then described the major drawbacks in cellar farms of the local regions, while in Neufeld's analyses "a significant number of tested samples showed an exceptional quality that gives hope that winemaking, but much more than that cellar farming of the local countries, will soon be able to rise to such a level that will allow transformation of the so obtained natural product



Slika 31. Stari podrum
Figure 31. Old cellar

Među autohtonim bijelim vinima posebno se ističe Žilavka. Kod nje se razlikuju dvije varijacije, od kojih je jedna manje ili više jake, zlatnožute boje, a druga svijetložute boje sa laganom zelenkastom nijansom, ali koje se prelijevaju jedna u drugu. Obje varijacije su jaka, zrela vina s izraženim miomirisom te svojim karakterom podsjećaju na bijela vina Burgundije. Osim toga Žilavka posjeduje i svojevrsni okus Muskatellera koji se posebno ističe kod zlatnožute sorte, dok svijetla zelenkasta sorta sa svojim ugodnim i lagano kiselkastim okusom i sa svojim miomirisima pomalo podsjeća na moselsko vino. Crna vina općenito pokazuju visok udio alkohola, naime od 9,32 % vol. do 13,06 % vol. ili u prosjeku 11,23 % vol. Bitno im je svojstvo visok udio ekstrakata i mineralnih tvari. No općenito gledano svojstvo vina mostarskoga kotara, kako crnih tako i bijelih, visoki je udio alkohola, ekstrakata, mineralnih tvari i fosforne kiseline. Ona su prema tome, s nekim iznimkama, vatrena (*feuerig*), jaka vina dobre, mnoga odlične i izvrsne kakvoće.

Sorte koje Neufeld navodi u radu, Žilavka, Blatina, Krkošija, Dobrogostina, Alicante Bouschet, i danas su temelj vinarstva u Hercegovini. Neke spomenute sorte su nestale (Osina, Skadarka), a neke se još uvijek uzgajaju, ali u manjoj mjeri poput: Žestaca, Podbjela, Crne pošipi, Rezakije. Analize koje je on tada proveo u Institutu za prehranu u Münchenu gotovo da se ne razlikuju od suvremenih analiza vina, bez obzira što je današnja oprema preciznija, a rezultati se dobiju brže. Razlike stoje jedino u analizi kiselina. I tada su rađene analize slobodnih, hlapljivih i ukupnih kiselina, ali su rezultati takvi da ih nije moguće uspoređivati s današnjim analizama. Zanimljivo je da vina s područja mostarskoga kotara Neufeld smatra ljekovitima zbog velika udjela fosforne kiseline i time vrlo zanimljivim za medicinu (Neufeld 1901.).

Unapređenje podrumarstva i kakvoće vina

Prvi vinarski podrumi grade se u Mostaru, što je uvjetovano ne samo već razvijenim vinogradarstvom, već i komunikacijama. Željeznička pruga od Mostara do Metkovića izgrađena je 1885., a do Sarajeva 1891. godine. Kako je Metković bio lučki grad, a Sarajevo

into a lasting and valuable trade item." Neufeld attributed this situation and the achieved level to measures of the national government of Bosnia and Herzegovina that succeeded in educating a considerable number of wine-growing population about modern winemaking, "whose products on this very day can compete with the best ones in the market." Better Herzegovinian wine varieties became quite a significant trading commodity as soon as they became known in wider circles, writes Neufeld. He also stresses that winemaking in Herzegovina rested almost exclusively in the hands of larger growers who purchase for their own winemaking additional grapes picked by other wine-growers.

Zilavka especially stands out among autochthonous white wines. It is distinguished by two variants, of which one is more or less in a strong, golden yellow color, and the other in a bright yellow color with a light greenish nuance, but which iridesce. Both variants are strong, mature wines with pronounced fragrance and in their character they are reminiscent of white wines of Burgundy. Besides, Zilavka also has a kind of taste of Muskateller that especially stands out in the golden-yellow variety, while the bright greenish variety with its pleasant and slightly sour taste and with its fragrances is somewhat reminiscent of Moselle wine. Generally, red wines show a high proportion of alcohol, namely from 9.32% vol. to 13.06% vol. or 11.23% vol. on the average. An important characteristic is their high proportion of extracts and mineral substances. But, in general terms, the characteristics of wines of the Mostar district, both red and white ones, is a high content of alcohol, extracts, mineral substances and phosphoric acid. They are consequently, with some exceptions, fiery (feuerig), strong wines of a good, many of excellent and of superb quality.

Varieties listed by Neufeld in the paper, Zilavka, Blatina, Krkosija, Dobrogostina, Alicante bouschet, are even now the foundation of winemaking in Herzegovina. Some mentioned varieties have gone (Osina, Skadarka), and some are still grown, but to a lesser extent, like Zestac, Podbjel, Crni posip, Rezakija. Analyses that he then conducted at the Institute of Nutrition in Munich almost did not have any difference with modern analyses of wine, notwithstanding that

željeznicom preko Broda povezano s ostalim dijelovima tadašnje Austro-Ugarske Monarhije, Hercegovina je dobila nove trgovačke putove i izlaz u svijet.

Prvi podrum u Mostaru osnovali su Braća Jelačić 1882. godine, a zatim obitelji: Kovačina, Krulj, Oborina, Peško, Radulović, Golubović, Šantić i drugi. Tek početkom 20. stoljeća, nakon izgradnje cesta do pojedinih mjesta u Hercegovini, počinje otvaranje vinskih podruma u Trebinju, Stocu, Konjicu, Ljubuškom, Čitluku. Svoje podrume u Stocu imale su obitelji Ružić, Kurilić, Popara, Hamović, Vukasović i Perišić. U Trebinju su bila tri važna podruma iz obitelji Jovičić, Andrić i Vujičić. Za ono doba ti su podrumi bili moderni i uglavnom su proizvodili vina Žilavku, Blatinu, Malagu, Muškat, Ružicu i Samotok. Vina iz tih podruma, zbog svoje kakvoće, brzo su pronašla vinoljupce kako na domaćem tako i na inozemnom tržištu. Na međunarodnim ocjenjivanjima u Parizu, Londonu, Budimpešti, Amsterdamu, Bruxellesu, Trstu, Barceloni i Lozani dobivala su najveća priznanja i odličja i tako su hercegovačka vina svrstavana među najkvalitetnija svjetska

today's equipment is more precise, and results are obtained faster. Differences are only in the analysis of acids. Analysis of free, volatile and total acids were conducted then too, but the results are such that they cannot be compared with today's analyses. It is interesting that Neufeld finds wines from the area of the Mostar district to be medicinal due to a high content of phosphoric acid and thereby very interesting for medicine (Neufeld 1901).

Improvement of winemaking and quality of wines

First winemaking cellars were built in Mostar, which was dependent not only on already developed wine-growing, but also on communications.The railroad from Mostar to Metkovic was constructed in 1885, and to Sarajevo in 1891. As Metkovic was a port town, and Sarajevo was connected by railroad via Brod with other parts of the then Austro-Hungarian Empire, so Herzegovina also gained access to the world and new trade ways.



Slika 32. Podrum Jelačić
Figure 32. Jelacic winery

vina (HEPOK, 1986.).

U vrijeme Austro-Ugarske Monarhije povećana je proizvodnja, ali i poboljšana kakvoća vina. Organiziraju se različiti tečajevi iz područja vinogradarstva i vinarstva. Trgovci vinom iz Hercegovine svoju djecu daju na školovanje u vinogradarsko-vinarsku školu u Klosterneuburgu. Rezultat toga su prvi školovani hercegovački kadrovi iz područja vinogradarstva i vinarstva. Kao rezultat kakvoća vina digla se na zavidnu razinu, pa se pronio po svijetu dobar glas o vinima Žilavke, Blatine, Samotoka i Ružice. Ta vina nisu bila samo poznata u Austro-Ugarskoj, već su se izvozila u Njemačku, Švicarsku, Španjolsku, Japan, Ameriku. Vinogradi i podrumi uz vinogradarsko-voćarske stanice u Gnojnicama i Lastvi prozvani su „carskim“, jer su visokokvalitetnim vinima opskrbljivali carski dvor u Beču.

Propadanje i obnova vinogradarstva i vinarstva

U vrijeme Prvoga svjetskog vrata dolazi do stagnacije vinogradarstva i vinarstva. Nakon svršetka rata, u Hercegovini je bilo oko 3.020 hektara pod vinogradima, zasađenim uglavnom domaćom lozom. Prva obnova vinograda na našim prostorima počinje 1920. godine, cijepljenjem plemenite loze na američke lozne podloge i traje do 1928. godine i samo je djelomično popravila stanje, pa se 1922. godine pod vinovom lozom našlo 3.707 hektara. Nakon toga dolazi velika ekonomska kriza, kada je hercegovački seljak bio pritisnut brojnim nedaćama od niskih otkupnih cijena do visoke zaduženosti što se negativno odrazilo na razvoj vinogradarstva. Hercegovina je Drugi svjetski rat dočekala s 3.500 hektara pod vinovom lozom. Bitno je spomenuti da su naša vina i dalje bila prisutna na međunarodnim ocjenjivanjima kakvoće i da su nastavila kontinuitet osvajanja najviših odličja.

Ljubomir Stjepanović 1921. piše: *Od istaknutijih crnih vina najglavnija je Blatina; za vrijeme filoksеrične invazije u Francuskoj izvozila se u Južnu Ameriku, osobito kao medicinalno vino za apoteke u Braziliji*. Osim toga opisuje i proizvodnju slatkoga vina (kaže da se proizvodi na sličan način kao i glasoviti tokajac) i vino

The first cellar in Mostar was founded by the Jelacic Brothers in 1882, and then the families Kovacina, Krulj, Oborina, Pesko, Radulovic, Golubovic, Santic and others. It was only in the 20th century, after the roads to some towns in Herzegovina were constructed, that opening of wine cellars started in Trebinje, Stolac, Konjic, Ljubuski, and Citluk. Ruzic, Kurilic, Popara, Hamovic, Vukasovic and Perisic families had their cellars in Stolac. In Trebinje there were three significant cellars of families Jovicic, Andric and Vujicic. The cellars were modern for the time and were mainly producing the wines Zilavka, Blatina, Malaga, Muskat, Ruzica and Samotok. Wines from these cellars, thanks to their quality, quickly found wine-lovers both in the local and foreign market. In international assessments in Paris, London, Budapest, Amsterdam, Brussels, Trieste, Barcelona and Lausanne they received the highest awards and medals and so Hezegovinian wines were ranked among the best world wines (HEPOK, 1986).

In the time of the Austro-Hungarian Empire, production was increased, but also the quality of wine was improved. Various courses in the field of vine-growing and winemaking were organized. Wine merchants from Herzegovina sent their children to be educated in the school of viticulture and winemaking in Klosterneuburg. That resulted in the first educated Herzegovinian professionals in the field of viticulture and winemaking. As a result, wine quality rose to an enviable level, and the reputation of wines Zilavka, Blatina, Samotok and Ruzica became generally known in the world. Those wines were known not only in Austria - Hungary, but were exported to Germany, Switzerland, Spain, Japan, America. Vineyards and cellars within the fruit and wine growing stations in Gnojnice and Lastva were called “imperial” because they supplied the imperial court in Vienna with wines.

Decline and renewal of wine-growing and winemaking

During the First World War, wine-growing and winemaking stagnated. After the war, there were about 3,020 hectares of vineyards in Herzegovina, planted mainly with local vines. The first renewal of vineyards in our region

Malaga ispitivani u Beču i da se oba mogu koristiti kao ljekovita vina. Usto je naveo i vino od sorte Rezakija s 11,95 % vol. alkohola, 25,9 g ekstrakta i 0,86 g vinske kiselina u 100 cm³ (Stjepanović, 1921.).

Drugi svjetski rat ostavio je dubok trag u poljoprivredi posebice u vinogradarstvu i vinarstvu i vratio ga puno godina unatrag. Razloge stradavanja vinograda u Drugom svjetskom ratu treba tražiti prije svega u nemogućnosti kontinuirane obrade vinograda, zbog nedostatka radne snage uslijed ratnih djelovanja, tako da je Hercegovina kraj Drugoga svjetskog rata dočekala sa svega 3.021 hektar jako zapuštenih vinograda. Važno je to da u tom razdoblju dolazi do okrupnjavanja malih površina i prerađivačkih kapaciteta. Proces okrupnjavanja odvijao se formiranjem seljačkih radnih zadruga i državnih poljoprivrednih dobara. Jedan dio privatnih podruma bio je okupljen oko društvene organizacije *Bosnaplod*, a ostali u druge zadružne i poljoprivredne organizacije.Tako je okrupnjeno

started in 1920 by grafting cultivated vines onto American rootstocks and lasted until 1928, and it improved the situation only partially so in 1922 there were 3,707 hectares planted with vines. That was followed by the Great Depression, when Herzegovinian peasants were pressed by numerous hardships, from low purchasing price to high indebtedness, which had a negative effect on the development of viticulture. On the eve of the Second World War, Herzegovina had 3.500 hectares planted with vines. It is noteworthy that our wines continued to be present in international quality assessments and kept the continuity of winning the highest medals.

In 1921, Ljubomir Stjepanovic writes: „Out of outstanding red wines, the most important is Blatina; during the phylloxera invasion in France, it was exported to South America, especially as a medicinal wine for pharmacies in Brazil. In addition, he also describes the production of sweet wine (people say that it is produced in a similar way like the famous tokajac) and Malaga wine



Slika 33. Priznanje za hercegovačko vino iz 1898.
Figure 33. Award for Herzegovinian wine from 1898

55 privatnih podruma ukupna kapaciteta 45.000 hl.

U Mostaru je 1948. godine formiran Poljoprivredni zavod s ciljem revitalizacije vinogradarstva i vinarstva. Imao je svoje eksperimentalne objekte u Gnojnicama, Ilićima i Vrapčićima. U vinogradarsko-vinarskom odsjeku pri Zavodu bio je dobro opremljen enološki laboratorij. Kontinuitet Poljoprivrednoga zavoda nastavlja *Sreska,* poljoprivredna stanica u Mostaru, osnovana 1956. godine (HEPOK, 1986.).

Moderno podrumarstvo

Početkom pedesetih godina prošlog stoljeća počinje podizanje modernih plantažnih vinograda u društvenom sektoru, a podižu ih zemljoradničke zadruge. Tada se počinju graditi moderniji zadružni podrumi u Stocu, Domanovićima, Ljubuškom i Brotnju. Prvi veći moderni podrum otvoren je u Međugorju 1954. godine s kapacitetom 4.000 hl. Zemljoradničke zadruge otkupljuju tržne viškove grožđa od privatnika koji u to vrijeme nisu imali dostatnih kapaciteta u vlastitim podrumima. U većini malih individualnih podruma i konoba prerada grožđa bila je na primitivan i zaostao način. Samo su pojedini napredni i financijski jači vinogradari u mostarskoj kotlini, Brotnju i Ljubuškom imali jako dobra vina, osobito Žilavku i Blatinu. Sve do 1954. godine podrumi su bili opremljeni isključivo hrastovim bačvama, nedovoljno stručnim kadrom i vrlo oskudnim uređajima za preradu grožđa. Uglavnom su to bili nacionalizirani podrumi nekadašnjih vinskih trgovaca

Prva veća modernija vinarija sagrađena je 1954. godine u Ljubuškom, kapaciteta 12.000 hl. Bila je opremljena betonskim cisternama i opremom za preradu grožđa i doradu vina. Od 1957. do 1961. godine sagrađene su suvremene vinarije u Čitluku (19.000 hl), Mostaru (45.000 hl), Stocu (16.000 hl), Domanovićima (6.000 hl), dakle ukupan kapacitet je iznosio 98.000 hl. Paralelno s izgradnjom vinarija podizani su suvremeni plantažni vinogradi u društvenom vlasništvu na području općina Čitluk, Mostar, Ljubuški, Čapljina, Stolac i Trebinje.

Početkom šezdesetih godina dvadesetoga stoljeća

were tested in Vienna and that both can be used as medicinal wines. Besides, he also mentioned the wine of the Rezakija variety with 11.95% vol. alcohol, 2.59 g extract and 0.86 g tartaric acid in 100 cm^3 (Stjepanovic, 1921).

The Second World War left a deep mark in agriculture, especially in viticulture and winemaking, and turned the clock back many years. The reasons for hardships of vineyards in the Second World War should be primarily sought in the inability to cultivate vineyards continuously, because of the lack of manpower due to war activities, so that Herzegovina at the end of the Second World War had only 3,021 hectares of very neglected vineyards. It is significant that concentration of small areas and processing capacities occurred in this period. The process of consolidation was developing by formation of farming cooperatives and state farms. One part of private cellars was united around the social organization "Bosnaplod," and others in other cooperative and agricultural organizations. Thus, 55 private cellars with the total capacity of 45,000 hl were concentrated.

In Mostar in 1948, the Agricultural Institute was formed with the purpose of revitalizing viticulture and winemaking. It had its experimental facilities in Gnojnice, Ilici and Vrapcici. The viticultural and oenological department of the institute had a well equipped oenological laboratory. The continuity of the Agricultural Institute was resumed by the district agricultural station in Mostar founded in 1956 (HEPOK, 1986).

Modern winemaking

Establishment of modern plantation vineyards in the social sector started in the early 1950s, and they were established by farming cooperatives. Construction of modern cooperative cellars in Stolac, Domanovici, Ljubuski and Brotnjo started at that time. The first modern cellar was opened in Medjugorje in 1954 with a capacity of 4,000 hl. Farming cooperatives purchased market surpluses of grapes from private owners who did not have sufficient capacities in their own cellars at that time. In the most of small individual cellars and taverns, grapes were processed in a primitive and obsolete manner. Only some advanced and



Slika 34. Zadržni podrum u Međugorju 1954. godine
Figure 34. Cooperative cellar in Medjugorje in 1954

započinje integracija u društvenom sektoru da bi se 1966. formirao HEPOK vodeća poljoprivredna organizacija koja je ujedinjavala proizvodnju, preradu i promet grožđa, voća, vina, alkoholnih i bezalkoholnih pića. Integracijom cjelokupne poljoprivredne proizvodnje, prerade, trgovine i ugostiteljstva 1981. godine nastaje SOUR *Hercegovina* – agroindustrijski, prometni i ugostiteljski kombinat – APRO. Unutar organizacije APRO najsnažnija radna organizacija bila je HEPOK Čapljina i radna organizacija *Popovo polje* i *Agrokop* Trebinje. Površine pod vinogradima 1985. godine iznosile su oko 6.000 ha, od toga u društvenom sektoru 2.000 ha, a kapaciteti vinarija 375.000 hl.

Vinarija Winery	1961.	1972.	1985.
Mostar	45.000	45.000	96.000
Čitluk	19.000	27.000	100.000
Ljubuški	12.000	31.000	85.000
Stolac	16.000	38.000	81.000
Domanovići	6.000	6.000	13.000
Svega Total	98.000	147.000	375.000

Tablica 8. Kapaciteti vinarija u Hercegovini u hl
Table 8. Capacities of wineries in Herzegovina in hl

financially stronger wine-growers in the Mostar valley, Brotnjo and Ljubuski had very good wines, especially Zilavka and Blatina. Up until 1954, cellars were equipped only with oak barrels, insufficient professional staff and very scarce grape processing devices. These were mainly nationalized cellars of former wine merchants.

The first larger modern winery was constructed in 1954 in Ljubuski, with the capacity of 12,000 hl. It was equipped with concrete tanks and equipment for grape processing and final processing of wine. From 1957 to 1961, modern wineries in Citluk (19,000 hl), Mostar (45,000 hl), Stolac (16,000 hl), and Domanovici (6,000 hl) were constructed, so the total capacity was 98,000 hl. In parallel with construction of wineries, modern socially-owned plantation vineyards were established in areas of the municipalities of Citluk, Mostar, Ljubuski, Capljina, Stolac and Trebinje.

Integration in the social sector started in the early 1960s, which resulted in 1966 in formation of HEPOK, the leading agricultural organization that combined production, processing and trade of grapes, fruits, wine, alcoholic and soft drinks. Integration of the entire agricultural production, processing, trade and catering in 1981 resulted in SOUR „Hercegovina“ – Agroindustrial, Trade and Catering Conglomerate APRO. HEPOK

U sklopu APRO Hercegovina osnovana je i RO Istraživačko-razvojni institut Mostar. Osim zaposlenih stručnjaka iz područja vinogradarstva i vinarstva u Istraživačko-razvojnom institutu, radi poboljšanja tehnike i tehnologije prerade grožđa, bili su uključeni svi agronomi i enolozi iz vinarija, zatim istraživači u enološkim laboratorijima radi rješavanja problema oko uvođenja novih strojeva za preradu grožđa, primjena novih tehnologija u proizvodnji vina, kreiranje novih tipova vina i osuvremenjivanja analiza vina primjenom novih metodologija.

Osamdesetih godina prošloga stoljeća Zakon o vinu dopušta individualnim proizvođačima da mogu proizvoditi vina, puniti u boce s etiketom, plasirati na tržište, te da se mogu ravnopravno uključiti u vinsku utakmicu zajedno s vinima iz velikih vinarija u društvenom vlasništvu. To je bio pozitivan iskorak u profiliranju Hercegovine kao vinogradarsko-vinarske regije i intenziviranju te poljodjelske grane (Hepok, 1986.).

Ratna zbivanja devedesetih godina prošloga stoljeća ostavila su nesagledive posljedice u vinogradarstvu i vinarstvu. Površina pod vinovom lozom skoro su prepolovljene. Odmah po završetku rata započela je obnova vinograda naročito u privatnom vlasništvu. Uz postojeće velike vinarije sve je više ambicioznih manjih individualnih privatnih vinogradara i vinara koji teže vinskim vrhuncima. Najviše ih je u Brotnju, zatim općinama Trebinje, Mostar, Ljubuški, Čapljina, Široki Brijeg, koji imaju zaštitu zemljopisnoga podrijetla svojih vina, prvenstveno autohtonih sorata Žilavke i Blatine, a otvorene su i tri vinarije na području sjeverne Bosne. U posljednjih dvadeset godina bilo je u Bosni i Hercegovini registrirano ukupno 60 proizvođača vina i rakije. Zbog nedonošenja podzakonskih akata (pravilnika) koji se naslanjaju na Zakon o vinu, mnogi su manji proizvođači prestali buteljirati svoja vina, pa ih prodaju u rinfuzi. Danas je u cijeloj državi ukupno registrirano 46 vinarija. Trenutačna situacija je takva da se sve manje piju buteljirana vina, a proizvođači imaju premale količine da bi se okrenuli izvozu.

Capljina and corporations “Popovo polje” and “Agrokop” Trebinje were the strongest business organizations within the APRO organization. In 1985, the total area of vineyards was about 6,000 ha, of which 2,000 ha in the social sector, and capacities of wineries were 375,000 hl.

The organization Research and Development Institute Mostar was founded within APRO Herzegovina. In addition to employed experts in the field of viticulture and winemaking, all agronomists and oenologists from wineries were involved in the Research and Development Institute in order to improve grape processing techniques and technologies, then researchers in oenological laboratories to handle the problems of introduction of new grape processing machines, application of new technologies in production of wine, creation of new types of wine and modernization of wine analyses by applying new methodologies.

In 1980s, the Wine Act allowed individual producers to produce wines, fill bottles with labels, market, and get involved on an equal basis in the wine competition together with wines from large socially-owned wineries. That was a positive move in profiling Herzegovina as a wine-growing and winemaking region and intensification of this agricultural branch (*Hepok*, 1986).

War activities in the 1990s left immeasurable consequences in wine-growing and winemaking. Areas planted with vines almost halved. End of the war was promptly followed by the beginning of renewal of vineyards, particularly in the private sector. Along with the existing large wineries, there was a growing number of ambitious smaller individual private wine-growers or wine-makers who aimed for excellency in wine making. Most of them were in Brotnjo, then in the municipalities of Trebinje, Mostar, Ljubuski, Capljina, Siroki Brijeg, which have protection of geographic origin of their wines, primarily the autochthonous varieties of Zilavka and Blatina, and first three wineries in the area of northern Bosnia were opened too. In the last twenty years, there were totally 60 producers of wine and brandy registered in Bosnia and Herzegovina. Because of the failure to adopt bylaws (regulations) resting on the Wine Act, many minor producers abandoned bottling of thier wines, so they sell them in bulk.

Trgovina vinom

Već u doba Austro-Ugarske Monarhije, hercegovačka vina, prvenstveno Žilavka i Blatina, preko međunarodnih izložaba i sajmova stekla su velika svjetska priznanja i bila su u to vrijeme tražena, posebice u zapadnoj Europi. U razdoblju između dva svjetska rata, zbog gospodarske krize u čitavom svijetu, ta su se vina uglavnom prodavala na domaćem tržištu, a samo se mali dio izvozio u Njemačku, Čehoslovačku i Austriju. Nakon Drugoga svjetskog rata, trgovina vinom bila je u stagnaciji, ali od 1948. godine oporavlja se i jača, zahvaljujući enološkoj službi Poljoprivrednog zavoda u Mostaru. Izgradnjom suvremenih vinarija u Ljubuškom, Čitluku, Mostaru i Stocu, kakvoća hercegovačkih vina bilježi svoj uspon, a razlog tome je moderna tehnologija tijekom prerade grožđa i njege vina.

Izvozne količine vina nisu bile osobito velike, više su imale promidžbeni karakter. Osnivanjem poslovnice za izvoz *Mediteran* iz Mostara, porastao je izvoz hercegovačka vina. Putem te poslovnice u 1968. godini izvezeno je 4.700 hl vina od čega 2.500 hl Žilavke, a 1966. godine 3.200 hl. Sljedeće dvije godine izvoz je znatno smanjen zbog krize na međunarodnom tržištu, pa se i trgovina vinom svela na domaće tržište. Šezdesetih godina dvadesetoga stoljeća hercegovačka vina, osobito Žilavka i Blatina izvozila su se u: Njemačku, Poljsku, Čehoslovačku, Austriju, Švicarsku i SSSR.

Može se zaključiti da su hercegovačka vina u prvom redu Žilavka i Blatina, zadovoljila kako domaće tako i inozemne konzumente svojom kakvoćom, a dokaz tome su brojna odličja i medalje koja su naša vina pobrala na vinarskim manifestacijama, kako kod nas tako i u svijetu (HEPOK Mostar, 1969.).

Početkom osamdesetih godina dvadesetoga stoljeća APRO Hercegovina bio je vodeći izvoznik buteljiranih vina s prostora bivše države. Trgovalo se s 37 inozemnih tvrtki iz 28 zemalja. Najviše se izvozila Žilavka i Blatina (Hepok, 1986). Tako je 1989. godine samo na njemačko tržište izvezeno oko 1.000.000 butelja Žilavke Mostar, proizvedene u Vinariji *Čitluk*, zatim znatne količine Blatine Mostar proizvedene u Vinariji *Ljubuški* i Extra loze iz Destilerije

Nowadays, totally 46 wineries are registered in the entire country. The present situation in the country is such that bottled wines are consumed less and less, and they have too small quantities to become export-oriented.

Wine trade

As early as in the times of Austro-Hungarian Empire, Herzegovinian wines, primarily Zilavka and Blatina, through international shows and fairs, gained high international awards and were in demand at that time, especially in western Europe. In the period between the two world wars, those wines were mainly sold on the domestic market because of the economic crisis throughout the world, and only a small part was exported to Germany, Czechoslovakia and Austria. After the second world war, wine trade stagnated, but since 1948 it recovered and regained strength thanks to the oenological service of the Agricultural Institute in Mostar. As modern wineries were built in Ljubuski, Citluk, Mostar and Stolac, the quality of Herzegovinian wines was reported to have increased, and the reason for that was the modern technology during grape processing and care for wine.

Quantities of exported wines were not particularly high, they had a rather promotional character. Export of Herzegovinian wines was increased when the export agency "Mediteran" was established in Mostar. Through the export agency, 4,700 hl wine was exported in 1968, of which 2,500 hl Zilavka, and in 1966 it was 3.200 hl. In the following two years, export was decreased because of the crisis in the international market, so the wine trade was also reduced to the domestic market. In the 1960s, Herzegovinian wines, especially Zilavka and Blatina, were exported to: Germany, Poland, Czechoslovakia, Austria, Switzerland and USSR.

It can be concluded that Herzegovinian wines, in the first place Zilavka and Blatina, have satisfied the local as well as foreign consumers by its quality, which is corroborated by numerous awards and medals that our wines collected in wine events as much in the region as in the world (HEPOK Mostar, 1969).

Mostar.

Uz veće vinarije koje izvoze svoja vina oko 50 godina u Europu, Ameriku, Aziju, također i mlađi vinari koji su registrirali proizvodnju vina s kontroliranim podrijetlom, okreću se izvozu, iako najveći dio svoje proizvodnje prodaju na domaćem tržištu.

Svojstva hercegovačkih vina

Kvalitetna svojstva Žilavke i pratećih sorata

Široka znanstvena istraživanja najvažnijih hercegovačkih sorata Žilavke i Blatine i njihovih pratećih sorata započeta su pedesetih godina prošloga stoljeća. Prvi su ih započeli Milan Šupica, profesor Poljoprivrednoga fakulteta Sarajevo i Zlata Aničić iz Poljoprivredne stanice u Mostaru.

Zlata Aničić na temelju provedenih istraživanja tvrdi da je po gospodarskoj vrijednosti sorta Žilavka na prvom mjestu. Ona najviše rađa, daje najviše otoke, a isto tako i najveću količinu ukupnog šećera. Krkošija ne zaostaje po gospodarskoj vrijednosti iza Žilavke. Svi podaci o Žilavki i Krkošiji skoro su podjednaki. Dobrogostina je po gospodarskoj vrijednosti osrednja. Bena je posljednja. Ona daje najmanji prinos, manje otoke, kao i ukupna šećera. Stoga autorica smatra da u vinu Žilavka ne mora biti 70 % Žilavke, 20 % Krkošije i 10 % Bene, kako je to do tada bila praksa, nego udio Krkošije može biti znatno veći, a da su Bena i Dobrogostina više prikladne kao stolne sorte. Po gospodarskoj vrijednosti svrstava Blatinu iza Žilavke i Krkošije (Aničić, 1952.).

No Šupica smatra da se ekonomska vrijednost neke vinske sorte grožđa ne može cijeniti samo prema sadržaju šećera, nego treba uzeti u obzir ukupnu kiselost i aromatičnu vrijednost koja je važan čimbenik kakvoće vina. On tvrdi da od bijelih sorata u Hercegovini, Žilavka daleko odskače u aromi, pa se ispred nje ne može staviti niti jedna druga sorta. Pozivajući se na praktična iskustva tvrdi da Krkošija pri pijenju nije onako ugodna kao Žilavka, jer u sebi ima izvjesnu silinu, odnosno oštrinu koja odbija. Vino Krkošije bogato je alkoholom, a naročito ukupnim kiselinama, s prilično visokim aktivnim

In the early 1980s, APRO Herzegovina was the leading exporter of bottled wines from the area of the former state. Trading was carried on with 37 foreign companies from 28 countries. Zilavka and Blatina were exported the most (*Hepok*, 1986). Thus in 1989, about 1,000,000 bottles of Zilavka Mostar, produced in the Citluk Winery, were exported in the German market alone, as well as considerable quantities of Blatina Mostar produced in the Ljubuski Winery and Extra Grape Brandy from the Mostar Distillery.

With larger wineries that have been exporting their wines for about 50 years to Europe, America, Asia, younger wine-makers, who have registered wine production with controlled origin, are also orienting towards exports, although they sell most of their production on the domestic market.

Characteristics of Herzegovinian wines

Quality features of Zilavka and accompanying cultivars

Comprehensive scientific studies of the most important Herzegovinian varieties Zilavka and Blatina were begun in 1950s. They were first initiated by Milan Supica, professor of the Faculty of Agriculture in Sarajevo, and Zlata Anicic from the Agricultural Station in Mostar.

Based on the conducted research, Zlata Anicic claims that the Zilavka variety is in the first place in the economic value. It has highest yields, highest volumes of drained wines, and also the highest content of total sugars. In its economic value, Krkosija is not inferior to Zilavka. All data on Zilavka and Krkosija are almost equal. The economic value of Dobrogostina is average. Bena is the last. It has lowest yields, less drained wine, as well total sugars. Therefore the author believes that the Zilavka wine does not have to be made of 70% Zilavka variety, 20% Krkosija and 10% Bena, as was the practice by then, but that the proportion of Krkosija should be considerably higher, and Bena and Dobrogostina are more sutable as table varieties. She ranks Blatina behind Zilavka and Krkosija in economic value (Anicic, 1952).

But Supica argues that the economic value of a grape variety cannot be assessed only by its

aciditetom, dok Žilavka ne zaostaje u alkoholu, ali zato sadrži manje kiseline i nešto niži aktivni aciditet. Krkošija nema sortnoga mirisa i pri pijenju brzo zasićuje, naprotiv Žilavka ima svojstven, vrlo ugodan miris, po okusu je meka i ugodna, te izaziva prohtjev za pijenjem. Krkošija se brzo izbistri i to već prije prvoga pretakanja, a Žilavki treba duže vremena da se potpuno izbistri.

Miješanjem Žilavke s Krkošijom i Benom (a u manjoj količini eventualno i s drugim bijelim sortama), njezin se intenzivan miris razrjeđuje i dovodi na pravu mjeru. Međutim treba imati u vidu, da Žilavka u mješavini s drugim bijelim sortama može sačuvati svoj karakterističan miris jedino ako je zastupljena u natpolovičnoj količini. U lošijim godinama kad Žilavka ne može sazrjeti, njezin je miris slab, pa ona u mješavini mora biti jače zastupljena. I Šupica smatra da vino od sorte Bena predstavlja tip vina osrednje kakvoće i da bi ga trebalo koristiti za kupažiranje sa Žilavkom. Kvalitetno vino Žilavka trebala bi sačinjavati jedino mješavina Žilavke i Krkošije u odgovarajućem pravilnom omjeru, pa bi zbog toga u bijelom sortimentu grožđa trebalo zadržati

content of sugars, but it is necessary to take into consideration the total acidity and aromatic value which are important factors of wine quality. Out of white cultivars in Herzegovina, he claims that Zilavka is by far superior by its bouquet, so no other cultivar can be placed ahead of it. Drawing on practical experiences, he claims that Krkosija, when consumed, is not so pleasant as Zilavka, because it has in itself a certain strength, or unappealing sharpness. Wine made of Krkosija is rich in alcohol, and especially in total acids, with a fairly high active acidity, while Zilavka is equal in alcohol, but contains less acid and with a slightly lower active acidity. Krkosija does not have a varietal fragrance and satiates fast when consumed, whereas Zilavka has a characteristic, very pleasant fragrance, its taste is soft and pleasant and causes desire for drinking. Krkosija quickly clarifies, namely already before the first racking, while Zilavka takes longer to be fully clarified.

Mixing of Zilavka with Krkosija and Bena (and in a lesser amount possibly also with other white varieties), dilutes its intense fragrance and brings



Slika 35. Dozrijevanje vina u drvenim bačvama
Figure 35. Maturation of wine in wooden barrels

samo Žilavku sa 65 % - 70 % i Krkošiju s 30 % - 35 % (Šupica, 1952.).

Na Konferenciji vinogradarskih stručnjaka u Sarajevu u prosincu 1952. godine donesen je programski sortiment vinogradarstva na području BiH po kojemu odnos vinskih sorata u odnosu na stolne treba biti 90 % : 10 %. Odnos bijelih sorata prema crnim trebao bi biti 75 % : 25 %. U tom se programu kaže da bi od bijelih vinskih sorata trebala biti Žilavka najzastupljenija sa 70 %, Krkošija 20 %, i ostale sorte 10 %. Što se tiče crnoga sortimenta, Blatina bi trebala biti zastupljena sa 60 %, Skadarka, Plavka i Alicante Bouchet s po 10 %, i ostale crne sorte 10 %.

Analizom vina iz berbi 1950. i 1952. godine utvrđeno je da Krkošija šupljica ima dosta ukupnih kiselina i nisku pH-vrijednost. Žilavka s područja Mostarskoga vinogorja u obje godine istraživanja imala je nisku ukupnu kiselost, s vrlo niskom pH-vrijednošću. Žilavka iz Ljubuškoga vinogorja imala je dosta ukupnih kiselina, ali visoku pH-vrijednost, koja govori o posve nezadovoljavajućoj kiselosti vina. Vina sorte Bena u obje godine istraživanja pokazala su umjerenu količinu ukupnih kiselina, ali zato su imale visoku pH-vrijednost, što znači da je slabije kiselosti od Žilavke. Do tada se mislilo da Bena ima veći sadržaj ukupnih kiselina od Žilavke i da se miješanjem grožđa tih dviju sorata može dobiti vino sa većom kiselošću (Šupica, 1953.). To potvrđuje da se na taj način ne može poboljšati kiselost u vinu Žilavka.

Sva navedena i brojna druga istraživanja dovela su do zaključka da Žilavka Mostar ima sljedeće organoleptička svojstva:

- Boja: svijetlo zelenožuta u mladom, a slamnatožuta s nijansom zelene u starom vinu
- Bistroća: kristalno bistro
- Miris: fin, razvijen karakterističan za Žilavku s područja Hercegovine
- Okus: suh, pun, skladan i harmoničan

Količina osnovnih sastojaka u vinu Žilavka Mostar na temelju analiza koje su provele enološke službe PK *Hercegovina*- Mostar, kreću se u granicama (tablica 9.).

it to a proper measure. However, it should be kept in mind that in a mixture with other white varieties, Zilavka can preserve its distinctive fragrance only if it is present in a quantity of more than a half. In adverse years when Zilavka cannot ripen, its fragrance is weak, so its proportion in the mixture must be higher. Supica also believes that wine of the Bena variety represents a medium-quality type of wine and that it should be used for blending with Zilavka. The Zilavka quality wine should consist only of a blend of Zilavka and Krkosija in the adequate correct ratio, therefore in white varieties of grapes it would be necessary to keep only Zilavka with 65-70% and Krkosija with 30-35% (Supica, 1952).

In December 1952, the Conference of Viticultural Experts in Sarajevo adopted the program of varieties in viticulture in the territory of B&H according to which the proportion of wine to table varieties should be 90% : 10%. The ratio of white to red varieties should be 75% : 25%. This program specifies that, out of white wine varieties, Zilavka should be the most common with 70%, Krkosija 20%, and other varieties 10%. As for red varieties, Blatina should be present with 60%, Skadarka, Plavka and Alicante bouchet with 10% each, and other red varieties with 10%.

The analysis of the 1950 and 1952 vintage wines established that Krkosija supljica had considerable acids and a low pH, which was manifested in both study years. Zilavka from the area of the Mostar wine-growing region had a low total acidity in both study years, with low pH values. Zilavka from the Ljubuski wine-growing region had considerable total acids, but high pH, which indicates an entirely unsatisfactory acidity of wine. Bena variety wines in both years of the study showed moderate quantities of total acids, however they had high pH, which means lower acidity than Zilavka. Until then, it was believed that Bena had a higher content of total acids than Zilavka and that blending these two varieties can produce wine with higher acidity (Supica, 1953). This confirms that acidity in the Zilavka wine cannot be improved in that manner.

All the mentioned and many other studies have led to the conclusion that Zilavka Mostar has the following organoleptic characteristics:

Tablica 9. Osnovni sastojci vina Žilavke
Table 9. Basic composition of Žilavka wine

Elementi analize Analysis elements	Sadržaj u vinu Content in wine	
	minimalni minimal	maksimalni maximal
Specifična težina Specific gravity	0,9890	0,9921
Alkohol vol. % Alcohol vol. %	12,00	13,77
Ukupni ekstrakt g/L Total extract	20,00	25,30
Ukupan šećer kao invertni g/L Total sugar as invert sugar g/L	1,00	1,40
Ekstrakt bez šećera g/L Extract without sugar g/L	20,00	25,30
Ukupna kiselina (kao vinska) g/L Total acids (as tartaric acid) g/L	4,57	6,20
Hlapljiva kiselina (kao octena) g/L Volatile acid (as acetic acid) g/L	0,35	0,75
Slobodna vinska kiselina g/L Free tartaric acid g/L	1,02	2,48
Pepeo g/L Ash g/L	1,55	2,38
Glicerol g/L Glycerol g/L	7,40	10,5
Fosforna kiselina g/L Phosphoric acid g/L	0,23	0,56



- Color: pale greenish yellow in young, and straw yellow with a nuance of green in old wine
- Clarity: crystal clear
- Fragrance: fine, developed, typical for Zilavka from the area of Herzegovina
- Taste: dry, full, balanced and harmonious

Quantities of basic elements in the Zilavka Mostar wine based on analyses conducted by the oenological service of the Food Conglomerate “Hercegovina“ - Mostar, range within (table 9.).

Zaštita geografskoga podrijetla vina Žilavka

Nakon brojnih istraživanja provedenih pedesetih i šezdesetih godina, započet je postupak zaštite geografskoga podrijetla vina Žilavka. Od 1961. do 1970. godine na prostoru bivše države Jugoslavije zakonom su zaštićena i proglašena tri vrhunska crna vina (Dingač, Postup-Potomje, Postup-Donja Banda) i tri bijela vina (Maraština-Čara Smokvica, Pošip-Čara Smokvica i Žilavka Mostar)

Žilavka Mostar je dakle među prvim vinima na prostoru bivše države zaštićena kao vrhunsko vino (1970. godine). U Elaboratu Žilavke Mostar kao čuvenoga vina iz 1969. godine stoji da je čuveno vino Žilavka Mostar mješavina tri sorte grožđa: Žilavke 70 %, Krkošije 20 % i Bene 10 %. U to vrijeme bilo je dopušteno da vino može nositi ime sorte ako je njezina zastupljenost veća od 50 %. Međutim, europski propisi, kao i naš važeći Zakon o vinu, kažu da ako vino nosi ime sorte mora sadržavati najmanje 85 % sorte po kojoj nosi naziv, pa se tako Elaborat Žilavke Mostar morao prilagoditi Zakonu o vinu.

Vrhunsko vino Žilavka Mostar na području Hercegovine simbol je bijeloga vina, vrlo cijenjene kakvoće koja se proizvodi od istoimene sorte i njezinih pratilaca Krkošije i Bene. U kompoziciju toga vina ulazi 85 % Žilavke i 15 % Krkošije i Bene. Tradicionalna visoka kakvoća vina Žilavka u zemlji i inozemstvu poistovjetila se sa sunčanim podnebljem hercegovačkog juga. Posjeduje plemeniti nježni miris i harmoničan okus. To vrhunsko vino sadrži 12 % do 13,77 % vol. alkohola, 20 do 27 g/L ukupna ekstrakta, i 5 do 6,2 g/L ukupnih kiselina. Ima svijetlo zelenožutu boju, specifičnu sortnu aromu i harmoničan okus (Kovačina i Pediša, 1987.).

Razvidno je da autori zagovaraju da u kompoziciji vina Žilavka treba sudjelovati Krkošija i Bena u različitim omjerima. Međutim u posljednje je vrijeme Krkošija sve manje zastupljena u hercegovačkim vinogradima, zbog varijabilne rodnosti, a razlog tomu su anomalije pri otvaranju cvjetne kapice u obliku zvjezdice što pridonosi slaboj oplodnji i zametanju bobice. Bene je također sve manje jer su ranija istraživanja pokazala da u pogledu gospodarske vrijednosti zaostaje za Žilavkom i Krkošijom. Danas se većinom

Protection of the geographic origin of the Zilavka wine

Numerous studies conducted in fifties and sixties were followed by the beginning of the procedure for protection of the geographical origin of the Zilavka wine. In the period from 1961 to 1970, three red wines (Dingac, Postup-Potomje, Postup-Donja Banda) and three white wines (Marastina-Cara Smokvica, Posip-Cara Smokvica and Zilavka Mostar) were legally protected and declared premium quality wines in the area of the former state of Yugoslavia.

Consequently, Zilavka is among the first wines in the area of the former state protected as premium quality wines (in 1970). In the 1969 study of Zilavka Mostar as the famous wine it is written that the famous wine Zilavka Mostar is a blend of three varieties of grapes: Zilavka 70%, Krkosija 20% and Bena 10%. At that time, it was allowed for a wine to have the name of the variety if its proportion was greater than 50%. However, European regulations, as well as our applicable Wine Act state that if a wine has the name of a variety, it must contain at least 85% of the variety after which it is named, so that the Study of Zilavka Mostar had to be adapted to the Wine Act.

In Herzegovina, the premium quality wine Zilavka Mostar is a symbol of white wine, with a highly valued quality, which is produced from the same-name variety and its supporters Krkosija and Bena. The composition of this wine is 85% Zilavka and 15% Krkosija and Bena. The traditional high quality of the Zilavka wine in the country and abroad is identified with the sunny climate of the Herzegovinian south. It has a noble delicate fragrance and a harmonious taste. This premium quality wine contains 12 to 13.77% vol. alcohol, 20 to 27 g/L total extract, and 5 to 6.2 g/L total acids. It has a bright yellow greenish color, a specific varietal aroma and harmonious taste (Kovacina, Pedisa, 1987).

It is evident from the above that the authors argue that composition of the Zilavka wine should include Krkosija and Bena in different proportions. However, Krkosija is less and less present in Herzegovinian vineyards recently because of its variable yield due to anomalies in opening of star-like flower caps, which is



Slika 36. Moderna vinarija
Figure 36. Modern winery

podižu čisti sortni nasadi Žilavke i počela su se proizvoditi čista sortna vina. Novija istraživanja pokazala su da se primjenom modernih tehnika i tehnologija mogu dobiti čista sortna vina Žilavka vrhunske kakvoće. Ta konstatacija ne umanjuje gospodarsku vrijednost Krkošije i Bene koje bi se mogle i dalje koristiti u kupaži sa Žilavkom za proizvodnju kvalitetnih vina, ali i kao čista sortna vina.

Bijela vina dobre kakvoće karakterizira prepoznatljiva i lijepo izražena aroma sorte usklađena s finim voćnim mirisima, te pun i zaokružen okus uravnotežena odnosa alkohola i ukupne kiselosti. Brojni čimbenici mogu utjecati na kakvoću bijelih vina: sorta, godina berbe, tlo, klima, urod po trsu, vrijeme berbe, bistroća mošta, kvasci, a nedvojbeno jedan od vrlo važnih je tijek procesa alkoholne fermentacije. Metabolizam kvaščeve stanice i sinteza brojnih spojeva važnih za kakvoću vina, u velikoj su mjeri ovisni o temperaturnim uvjetima pod kojima protječe razgradnja šećera. Miris vina veoma je složen i jedan je od osnovnih čimbenika njegove kakvoće. Za vina koja nemaju izraženu i prepoznatljivu

responsible for poor fertilization and fruit set of berries. Bena is also less and less present because earlier studies showed that it is inferior to Zilavka and Krkosija in terms of its economic value. The common practice presently is establishing pure varietal plantations and production of pure varietal wines has begun. Recent studies have shown that pure sortal Zilavka wines of a premium quality may be achieved by applying modern techniques and technologies. This finding does not affect economic values of Krkosija and Bena which could still be used in blends with Zilavka for production of quality wines but also as pure sortal wines.

Good quality white wines are characterized by distinctive and beautifully pronounced aroma of the variety harmonized with fine fruity fragrances and full and rounded taste of balanced proportion of alcohol and total acidity. A number of factors may influence the quality of white wines: variety, vintage, soil, climate, yield per vine, harvest time, clarity of must, yeasts, and undoubtedly one of the most important is the course of the process of alcoholic fermentation. Metabolism

aromu sorte, veoma su važni voćni mirisi koji se formiraju tijekom fermentacije pri nižim temperaturama.

Bijelim vinima dobre kakvoće, proizvedenim od sorata s vlastitom aromom, svojstvena je prepoznatljiva i lijepo izražena aroma, karakteristična za kultivar, koja mora biti dobro sljubljena s finim voćnim mirisima hlađene fermentacije. Nedvojbeno je da se dobra vina Žilavke odlikuju veoma ugodnom i prepoznatljivom aromom sorte, no nažalost ona nije terminološki detaljnije determinirana. Poznato je da temperature tijekom alkoholne fermentacije modificiraju metabolizam kvasaca, što se prvenstveno očituje u biosintezi viših alkohola, acetatnih estera i etil estera masnih kiselina, spojeva koji čine glavni dio fermentacijske arome mladih vina. Pri nižim temperaturama fermentacije, jača je sinteza hlapljivih estera, a manje viših alkohola. U čistim sortnim vinima Žilavke dobivenim fermentacijom pri nižim temperaturama svojstveni su ugodni voćni i cvjetni mirisi. Suprotno tome, vina dobivena pri višim temperaturama fermentacije sadrže veće koncentracije pojedinih viših alkohola, dok je koncentracija estera manja, kako zbog slabije sinteze, tako i radi njihove brže hidrolize i hlapljenja. Na temelju navedenoga, moguće je pretpostaviti da su ocjene za senzorna svojstva vina pojedinih tretmana uvelike ovisile o udjelu voćnih aroma fermentacije i spojeva karakterističnih za aromu kultivara.

Ocjenjivanja su pokazala da su niže temperature tijekom fermentacije rezultirale općenito boljom kakvoćom vina Žilavke. Međutim, vina Žilavke dobivena fermentacijom na temperaturi od 20 ºC bila su bolje kakvoće nego ona dobivena fermentacijom na 15 ºC. Fermentacija na 20 ºC rezultirala je vinima s prepoznatljivom i karakterističnom aromom sorte, koja je bila veoma lijepo sljubljena s voćnim mirisima hlađene fermentacije. Iako nisu analitički određivani, pretpostavljamo da je u vinima fermentiranim na nižoj temperaturi bilo nešto više hlapljivih estera, koji su u mirisu vina bili dominantni nad spojevima koji karakteriziraju aromu sorte. Istraživanja su pokazala da su kakvoćom bila najlošija vina dobivena fermentacijom na temperaturama iznad 25 ºC, čemu su uvelike i

of yeast cells and synthesis of many compounds important for quality of wine are largely dependent on temperature conditions under which decomposition of sugars occurs. Fragrance of wine is very complex and is one of the main factors of its quality. For wines that do not have a marked and recognizable varietal aroma very important are fruity fragrances that are formed during fermentation at lower temperatures.

Good quality white wines, produced from varieties with their own aroma, are characterized by a distinctive and beautifully expressed aroma, typical of the cultivar, which must be well blended with subtle fruity fragrances of cooled fermentation. There is no doubt that good Zilavka wines are characterized by very pleasing and distinctive aroma of the variety, but unfortunately it is not terminologically determined in more detail. It is known that temperatures modify the metabolism of yeast during alcoholic fermentation, which is primarily manifested in biosynthesis of higher alcohols, acetate esters and ethyl esters of fatty acids, compounds that constitute the main part of the fermentation aromas of new wines. At lower fermentation temperatures, synthesis of volatile esters is stronger and of higher alcohols weaker. In pure Zilavka varietal wines obtained by fermentation at lower temperatures, pleasant fruity and floral scents are typical. In contrast, wines produced by fermentation at higher temperatures contain higher concentrations of specific higher alcohols, while concentrations of esters are lower, due to weaker synthesis and faster hydrolysis and evaporation. Based on the above, it is possible to assume that evaluations for sensory properties of wines of specific treatments largely depended on the proportion of fermentation fruit aromas and compounds characteristic for varietal aroma. Evaluations showed that lower temperatures during fermentation resulted in generally higher quality of Zilavka wines. However, Zilavka wines produced by fermentation at the temperature of 20 °C had higher quality than those obtained by fermentation at 15 °C. Fermentation at 20 ºC resulted in wines with a recognizable and characteristic varietal aroma that was very beautifully blended with fruity fragrances of cooled fermentation. Although they were not analytically determined, we assume that wines

doprinijele visoke koncentracije viših alkohola, posebice izoamilnoga alkohola (Prusina, Herjavec, 2008.).

Također postupak kontrolirane maceracije grožđa uvelike može utjecati na poboljšanje kakvoće bijeloga vina, pa je u nekim zemljama postao standardni tehnološki postupak u procesu proizvodnje bijelih vina. U praksi se najčešće koristi klasična (temperatura od 20 °C do 25 °C) i hladna (temperatura od 5 °C do 10 °C) maceracija. Klasična maceracija može dovesti do povećane ekstrakcije fenolnih spojeva što je povezano s izraženijom astrigencijom i trpkoćom vina. Nasuprot tomu hladnom maceracijom dolazi do intenzivnije ekstrakcije aromatskih spojeva, dok je izdvajanje nepoželjnih fenolnih spojeva svedeno na najmanju moguću mjeru. Istraživanja su pokazala da različite duljine maceracije različito djeluju na kemijski sastav i senzorna svojstva vina Žilavka. Rezultati senzornoga ocjenjivanja pokazali su da je hladna maceracija pozitivno utjecala na kakvoću vina Žilavka. Kod vina dobivenih hladnom maceracijom više su naglašene sortne arome, intenzivniji miris, zaokružen i pun okus vina Žilavka. (Herjavec i sur. 2008.).

Kakvoća bijelih vina u bitnoj mjeri ovisi o vrsti i soju kvasaca koji provode alkoholnu fermentaciju. Sojevi kvasaca općenito se jako razlikuju po sintezi hlapljivih spojeva relevantnih za kakvoću vina, kao što su: viši alkoholi, hlapljivi esteri, hlapljive kiseline i sl. U proizvodnji vina Žilavka, autohtonoga vinskog kultivara Hercegovine, sve su prisutniji komercijalni preparati kvasaca, iako njihova primjena može rezultirati vinima, koja često nisu prepoznatljiva po sortnoj aromi i po području proizvodnje. Autohtoni sojevi kvasaca igraju veoma važnu ulogu kod tipičnosti senzornih svojstava sortnih vina. Provedena su istraživanja utjecaja fermentacija s različitim sojevima kvasaca *Saccharomyces cerevisiae* na koncentracije ukupnih i pojedinačnih viših alkohola, etil acetata, glicerola i organskih kiselina u vinima Žilavke, dobivenim od grožđa s tri ekološki različita položaja Mostarskoga vinogorja. Istraživanja su pokazala da kakvoća vina Žilavke, uz specifičnosti vinogradarskog položaja i godine berbe uvelike ovisi o sojevima kvasaca, koji provode alkoholnu fermentaciju.

fermented at lower temperatures had more volatile esters, which were dominant in fragrance of wines over compounds that characterize the varietal aroma. Studies have shown that wines of a most inferior quality resulted from fermentation at temperatures above 25 ºC, which was greatly contributed by high concentrations of higher alcohols, especially isoamyl alcohol (Prusina, Herjavec, 2008).

The technique of controlled maceration of grapes may also lead to a considerable improvement of the quality of white wine, so in some countries it has become a standard technological process in the white wine production process. The classic maceration (temperatures 20-25 °C) and cold maceration (temperatures 5-10 °C) are the most commonly used in practice. The classic maceration may lead to increased extraction of phenolic compounds, which is associated with pronounced astringency and dryness of wine. On the other hand, the cold maceration results in intense extraction of aromatic compounds, while extraction of undesirable phenolic compounds is reduced to the lowest possible level. Studies have shown that different duration of maceration has different effects on the chemical composition and sensory properties of the Zilavka wine. Results of sensory evaluation showed that the cold maceration had a positive effect on the quality of Zilavka wine. In Zilavka wines obtained by cold maceration, varietal aromas are more pronounced, fragrance more intense, taste rounded and full. (Herjavec et al. 2008).

Quality of white wines depends significantly on the type and strain of yeasts carrying out alcoholic fermentation. Yeast strains generally vary widely in synthesis of volatile compounds relevant to quality of wine, such as higher alcohols, volatile esters, volatile acids, etc. In production of the Zilavka wine, autochthonous wine variety of Herzegovina, commercial preparations of yeasts are increasingly present, although their use may result in wines that are often not recognizable for their varietal aroma and production area. Autochthonous strains of yeasts play a very important role in typicality of sensory characteristics of varietal wines. Research has been conducted on the influence of fermentation with different strains of the yeasts

Stoga bi u praktičnoj proizvodnji vina sorte Žilavka veoma vrijedno bilo koristiti autohtone sojeve kvasaca izolirane iz Mostarskoga vinogorja, što bi omogućilo vrhunsku kakvoću i sortnu prepoznatljivost vina Žilavka (Prusina, 2011.).

Rezultati provedenih istraživanja kazuju da je moguća proizvodnja čistoga sortnog vina Žilavka uz primjenu moderne tehnike i suvremenih tehnologija. Danas se u Hercegovini uglavnom proizvode čista sortna vina Žilavka, a brojne medalje i priznanja svjedoče da se radi o visoko kvalitetnoj sorti grožđa, gdje se uz stručnu vinifikaciju i primjenu modernih tehnologija mogu proizvesti vina vrhunske kakvoće.



Saccharomyces cerevisiae on concentrations of total and individual higher alcohols, ethyl acetates, glycerols and organic acids in the Zilavka wines produced from grapes from three environmentally different positions of the Mostar wine-growing region. The studies have shown that quality of the Zilavka wine, in addition to specific qualities of the wine-growing location and vintage, depends largely on strains of yeasts responsible for alcoholic fermentation. In practical production of the Zilavka variety wines, it would be therefore very worthwhile to use autochthonous yeast strains isolated from the Mostar wine-growing region, which would allow superior quality and varietal recognizability of the Zilavka wine (Prusina, 2011).

Results of the research indicate that production of pure varietal Zilavka wine is feasible with application of modern techniques and technologies. Presently Herzegovina mainly produces pure varietal Zilavka wines, and numerous medals and awards testify that this is a high quality variety of grapes, where wine of premium quality can be produced with professional vinification and application of modern technologies.



Slika 37. Manastirski podrum
Figure 37. Monastery cellar

Kvalitetna svojstva Blatine i pratećih sorata

Kao za Žilavku i za Blatinu su istodobno provedena brojna znanstvena istraživanja. Nakon dugogodišnjih istraživanja Šupica i Kaljužni (1958.) navode prosjeke šećera i kiseline za Blatinu:

Quality features of Blatina and accompanying cultivars

Like for Zilavka, numerous scientific studies have been carried out for Blatina too. After many years of research, Supica and Kaljuzni (1958) specify average sugars and acids for Blatina:

Tablica 10. Sadržaj šećera i kiselina u vinu Blatina
Table 10. Content of sugar and acids in Blatina wine

Vinogorje Wine-growing region	Br. godina ispitivanja No. of test years	Br. ispitanih uzoraka No. of tested samples	Šećer g/100 ml Sugar g/ 100 ml	Ukupna kiselina g/L Total acid g/L
Mostarsko	10	188	20,4	6,8
Broćansko	10	152	21,7	7,2
Dubravsko	7	60	22,8	6,7
Ljubuško	3	39	22,6	6,3
Prosjek Average			21,9	6,75

Autori su zaključili da među crnim sortama Blatina predstavlja najkvalitetniju sortu, koja pokazuje najskladniji odnos šećera i kiseline.

The authors concluded that among red varieties Blatina is the highest-quality variety that manifests the most balanced proportion of sugar and acid.

Istraživačko-razvojni centar Hepoka analizirao je sadržaj šećera i kiselina u razdoblju od 1955. do 1971. godine (tablica 11.).

Analyses of the Hepok Research and Development Center from 1955 to 1971 gave the following results:

Tablica 11. Sadržaj šećera i kiselina sorte Blatina u dugogodišnjem razdoblju
Table 11. Content of sugar and acid in Blatina cultivar during long period

Vinogorje Wine-growing region	Godina Year	Šećer % - Sugar %		Ukupna kiselina g/L Total acids g/L	
		min.	maks.	min.	maks.
Mostarsko	1955.	18,50	19,00	5,30	7,70
	1956.	17,80	19,90	5,60	6,10
	1960.	-	18,80	-	7,00
Broćansko	1957.	19,80	20,90	7,24	7,20
	1959.	19,50	21,00	6,00	7,40
	1960.	18,00	22,80	6,30	7,10
	1971.	18,40	20,00	8,00	8,60
Ljubuško	1956.	-	20,80	-	7,00
	1968.	18,60	22,60	6,40	7,20
	1971.	18,90	22,20	6,50	7,50
Dubravsko	1956.	-	19,10	-	8,00

Izvor/Source: HEPOK, Mostar, 1972.

Iz navedenih podataka vidljivo je da je prosjek šećera toliki da može dati vina jakosti 12,2 % vol., ali u godinama kada je manji urod, kada su povoljni agroekološki uvjeti, a grožđe tehnološki zrelo, šećeri mogu biti od 23 do 25 %, a alkohol u vinu od 13 do 15 % vol.

Čečuk (1958.) je pozivajući se tada na izvršenu rajonizaciju vinogradarstva BiH dao sljedeće mišljenje o kompoziciji za crno vino standard tipa Blatine:

- Blatina kao osnovna vodeća sorta s udjelom od 60 %,
- Skadarka i Plavka, kao prateće sorte s udjelom od 20 %,
- Alicante Bouchet, kao bojadiser s udjelom od 10 %,
- Ostale crne, probne sorte s udjelom od 10 %.

Slično smatra Šupica da bi kod crnih vinskih sorata Blatina trebala imati udjela 60 %, a njezine prateće sorte Skadarka, Plavka i Alicante Bouchet zajedno 40 %. Avramov i Briza (1965.) kažu o standardnoj Blatini da u izuzetnim godinama vino dostiže jačinu 13 do 15 % vol. alkohola. Vino je tamnocrvene boje, aromatično i veoma ugodna ukusa, vrlo traženo i cijenjeno u zemlji, a ima odličan plasman na inozemnom tržištu. Stojanović (1954.) piše da se od Blatine mogu dobiti kvalitetna crna vina, koja su tamnocrvene boje, jačine od 11 do 13 % volumnih alkohola, 6 – 7 ‰ ukupne kiseline i 0,6 g fosforne kiseline na jedan litar, jako aromatično i odlična okusa.

Prosječni rezultati 15-godišnjih analiza vina Blatina (1955. – 1970.), koje je radio enološki laboratorij Hepoka prikazani su u tablici 12.

Organoleptička svojstva vina Blatina Mostar:

- Boja: tamnocrvena
- Bistroća: kristalno bistro
- Miris: razvijen i karakterističan za sortu
- Okus: pun i harmoničan

Na temelju analiza koje je dugi niz godina provodila enološka služba Hepoka, dane su granične vrijednosti osnovnih parametara u vinu Blatina Mostar (Tablica13).

The listed data show that the average sugar is sufficient to give wine of a 12.2% vol. strength, but in some years when yields are lower, when environmental conditions are favorable, and grapes technologically ripened, sugars can be from 23 to 25% and alcohol in wine from 13 to 15% vol.

Cecuk (1958), referring to the zoning of BiH viticulture completed at that time, gave the following opinion on composition for red wine of the standard Blatina type;

- Blatina as the primary leading variety with the proportion of 60%
- Skadarka and Plavka, as supporting varieties with the proportion of 20%
- Alicante Bouchet, as the teinturier with the proportion of 10%
- Other red, test varieties with the proportion of 10%

Supica thinks similarly, that in the red wine varieties, Blatina should have a proportion of 60%, and its accompanying varieties Skadarka, Plavka and Alicante Bouchet together 40%. Avramov and Briza (1965) say about standard Blatina that the wine achieves the strength of 13 to 15% vol. in exceptional years. Wine is in dark red color, aromatic and of a very pleasant taste, very demanded and valued in the country, and has an excellent marketability in foreign markets. Stojanovic (1954) writes that Blatina can be used to produce high-quality red wines that are dark red in color, strength 11-13% in volume of alcohol, 6-7 ‰ of the total acid and 0.6 g of phosphoric acid per one liter, very aromatic and of a great taste.

Average results of 15-year analyses of the Blatina wine (1955 – 1970), conducted by the Hepok oenological laboratory are shown in table 12.

Organoleptic properties of the Blatina Mostar wine:

- Color: dark red
- Clarity: crystal clear
- Fragrance: developed and typical of the variety
- Taste: full and harmonious

Tablica 12. Kemijski sadržaj vina Blatina po vinogorjima
Table 12. Chemical content of Blatina wine by wine-growing regions

Elementi analize Analysis element	Vinogorje i lokalitet Wine-growing region and site		
	Mostarsko (26 uzoraka - samples)	Broćansko (88 uzoraka - samples)	Ljubuško (15 uzoraka - samples)
Alkohol vol. % Alcohol vol. %	12,41	12,70	12,75
Ukupni ekstrakt g/L Total extract g/L	25,52	26,13	26,22
Ukupna kiselina g/L Total acid g/L	5,46	5,52	5,07
Hlapljiva kiselina g/L Volatile acid	0,65	0,65	0,69
Nehlapljiva kiselina g/L Nonvolatile acid	4,21	4,66	4,12
Pepeo g/L Ash g/L	2,28	2,73	2,61
Fosforna kiselina g/L Phosphoric acid	0,54	0,34	0,38
pH-vrijednost pH value	3,20	3,18	3,10

Izvor/Source: HEPOK, 1972.

Zaštita geografskoga podrijetla Blatine

Od 1970. do 1973. godine niti jedno vino u tadašnjoj Jugoslaviji nije zaštićeno kao vrhunsko. Tek rješenjem Republičkoga sekretarijata za poljoprivredu i šumarstvo SR BiH br. 04-011-73 od 26. lipnja 1973. godine za čuveno vino proglašena je Blatina Mostar, a Naredbom o zaštiti porijekla čuvenog vina Blatina Mostar, koju je donio Sekretarijat pod br. 011-73 od 29. lipnja 1973. godine (Službeni list SR BiH br. 20 od 24. lipnja 1973.) to je vino i zakonom zaštićeno. Tako je 1973. godine u Jugoslaviji bilo sedam zaštićenih čuvenih vina među kojima su ranije zaštićena Žilavka Mostar i Blatina Mostar. Do proglašenja Blatine za čuveno vino došlo se nakon višegodišnjih ispitivanja. Područje za proizvodnju grožđa za čuveno vino Blatina Mostar je u biti isto kao i za Žilavku Mostar.

Kao što je poznato Blatina ima funkcionalno ženski cvijet i ne može se sama oploditi. Ona se zato sadi skupa s drugim crnim sortama koje cvjetaju u isto

Based on analyses conducted by the Hepok oenological service for many years, limit values of basic parameters in the Blatina Mostar wine are shown in table 13.

Protection of the geographic origin of Blatina

In the period from 1970 to 1973 not a single wine in the then Yugoslavia was protected as premium quality wine. It was only by the decision of the State Secretariat of Agriculture and Forestry of SR B&H no. 04-011-73 dated 26 June 1973 that Blatina Mostar was declared famous wine, and by the Decree on protection of origin of the famous wine Blatina Mostar, which was enacted by the same secretariat under no. 011-73 dated 29 June 1973 (Official Gazette of SR B&H no. 20 of 24 June 1973), this wine became protected by law. Thus in Yugoslavia in 1973, there were seven protected famous wines, among which Zilavka Mostar and Blatina Mostar were previously protected. Declaration of Blatina as famous wine

Tablica 13. Granične vrijednosti pojedinih sastojaka vina Blatina
Table 13. Limit values of some components of Blatina wine

Elementi analize Analysis elements	Sadržaj u vinu Contents in wine	
	minimalni	maksimalni
Specifična težina Specific gravity	0,9915	0,9998
Alkohol vol. % Alcohol vol. %	12,0	13,0
Ukupni ekstrakt g/L Total extract g/L	22,0	32,0
Ukupan šećer kao invertni g/L Total sugar as invert sugar g/L	1,0	1,5
Ekstrakt bez šećera g/L Extract without sugar g/L	22,0	31,0
Ukupna kiselina (kao vinska) g/L Total acids (as tartaric acid) g/L	5,0	7,0
Hlapljiva kiselina (kao octena) g/L Volatile acid (as acetic acid) g/L	0,35	0,80
Slobodna vinska kiselina g/L Free tartaric acid g/L	1,3	3,0
Pepeo g/L Ash g/L	1,6	3,5
Glicerol g/L Glycerol g/L	6,5	11,5
Fosforna kiselina g/L Phosphoric acid g/L	0,25	0,80

Izvor/Source: HEPOK, 1972.

vrijeme i služe kao oprašivači. Njezini pratioci su najčešće: Alicante Bouchet, Trnjak, Plavka, Kadarka, Gamay bojadiser, Merlot i Vranac. Crno (crveno) vino je cjenjenije ukoliko ima tamniju boju. Da bi se postigla tamnija boja kod Blatine, neophodno je da u njegovoj kompoziciji sudjeluju sorte tamnije boje. To su gore navedeni oprašivači, ali su istraživanja pokazala, da su pored drugih dobrih svojstava najbolje Alicante Bouchet, Gamay bojadiser, Merlot i Vranac (HEPOK Mostar, 1972.).

Standardni tip vina Blatine nikada nije bio čisto sortan, nego uvijek mješavina Blatine kao vodeće i drugih pratećih sorata, te se ne može govoriti o nekim ustaljenim i jednakim svojstvima vina

followed several years of studies. The area for production of grapes for the famous wine Blatina Mostar is essentially the same as for Zilavka Mostar.

As it is known, Blatina has a functionally female flower and cannot fertilize by itself. It is therefore planted together with other red varieties that bloom at the same time and are used as pollinators. Its companions are most often Alicante Bouchet, Trnjak, Plavka, Kadarka, Merlot and Vranac. Red (black) wine is more highly valued if its color is darker. To achieve a darker color in Blatina, it is necessary that a darker colored variety participates in its composition. These are the aforementioned pollinators, but studies have shown that the best

Blatina. Njegov sastav varira prema tome koja je količina ili omjer crnoga grožđa u vinu Blatina. Količina Blatine u standardnom tipu toga vina obično se kretala od 55 – 65 %, a prateće sorte bile su različite. Prvenstveno je to bio Alicante Bouchet, a tamo gdje ga je manje bilo kao npr. u Ljubuškom u kompoziciju vina je ulazio Trnjak čak i Plavka (HEPOK Mostar, 1972.).

Čuveno vino Blatina Mostar proizvodi se od mješavine sorata grožđa i to Blatine najmanje 70 %, a ostalih 30 % čine prateće sorte: Alicante Bouchet i Gamay bojadiser zajedno najviše 20 %, a oko 10 % Vranac i Merlot. Proglašenjem Blatine Mostar čuvenim vinom predviđeno je da ono mora imati sljedeća organoleptična svojstva: rubin tamnocrvenu boju, kristalnu bistroću, razvijen i karakterističan sortni miris i pun i harmoničan okus. Sadržaj alkohola u vinima je između 12 i 13 % vol., ekstrakt bez šećera od 24 – 31 g/L, ukupna kiselost 5 – 7 g/L, hlapljiva kiselost do 0,8 g/L (Gojković, 1973.).

Kao kod Žilavke tako i kod Blatine zakonska regulativa dopušta da neko vino nosi ime sorte, ako je u njezinom sastavu minimalno 85 % te sorte, pa se Elaborat o zaštiti čuvenog vina Blatina Mostar morao u tom dijelu korigirati (Kovačina i Pediša, 1987.). Vrhunsko vino Blatina Mostar proizvodi se od istoimene sorte grožđa i pratilaca Gamay bojadiser, Merlot i Vranac. Sorta Blatina zastupljena je s 85 %, a navedeni pratioci 15 %. Vrhunsko vino Blatina Mostar sadrži 12 – 13 % vol. alkohola, 25 – 32 g/L ukupna ekstrakta, 5 – 7 g/L ukupnih kiselina. Vino je rubin tamnocrvene boje, razvijena i karakteristična sortnoga mirisa, puna i harmonična okusa. Zbog svoje izvanredne kakvoće vrhunsko vino Blatina Mostar nositelj je brojnih priznanja i zlatnih medalja, a 1982. godine proglašeno je najboljim crnim vinom u Jugoslaviji na Novosadskom sajmu (Kovačina i Pediša 1987.)

Vino Blatina je već odavno poznato na domaćem i inozemnom tržištu. Na Jadranskoj izložbi vina u Splitu 1954. godine, Prvoj hercegovačkoj izložbi vina u Međunarodnom privrednom sajmu u Novom Sadu 1964., 1965., 1966., 1967., 1969. i 1971. godine ovo vino nagrađivano je zlatnim, srebrnim medaljama i diplomama za kakvoću.

Danas je na području Hercegovine podignuto

with other good qualities are Alicante Bouchet, Gamay teinturier, Merlot and Vranac (HEPOK Mostar, 1972).

The standard type of the Blatina wine has never been purely sortal, but always a blend of Blatina as the leading and other accompanying varieties, and we cannot talk about some well-established and equal properties of the Blatina wine. Its composition varies depending on the content or proportion of dark grapes in the Blatina wine. The content of Blatina in a standard type of this wine usually ranged from 55 to 65%, while accompanying varieties varied. Those were primarily Alicante bouchet, while sometimes its proportion was lower e.g. Trnjak and even Plavka were included in the composition of the wine in Ljubuski (HEPOK Mostar, 1972).

The famous wine Blatina Mostar is made of a blend of grape varieties, specifically Blatina minimum 70%, while the other 30% consist of the accompanying varieties: Alicante Bouchet and Gamay teinturier maximum 20% together, and about 10% Vranac and Merlot. By declaring Blatina Mostar as famous, this wine is expected to have the following organoleptic properties: dark ruby red color, crystal clarity, with a developed and typical sortal aroma and full bodied and harmonious taste. The content of alcohol in the wines is between 12 and 13% vol., extract without sugar 24 to 31 g/L, total acidity 5 to 7 g/L, volatile acidity up to 0.8 g/L (Gojkovic, 1973).

In Zilavka and in Blatina alike, legal provisions allow a wine to bear the name of the variety if it contains at least 85% of that variety, so the Study on protection of the famous wine Blatina Mostar had to be corrected in that part (Kovacina and Pedisa, 1987). The premium quality wine Blatina Mostar is produced from the same-name grape variety and the companions Gamay teinturier, Merlot and Vranac. The Blatina variety is represented with 85%, and the said companions with 15%. The premium quality wine Blatina Mostar has 12 to 13% vol. alcohol, 25 to 32 g/L total extract, 5 to 7 g/L total acids. The wine is in dark ruby red color, with a developed and characteristic sortal fragrance, full bodied and harmonious taste. Due to its exceptional quality, the premium quality wine Blatina Mostar is the holder of numerous awards and gold medals, and in 1982 it was

dosta vinograda sorte Blatina. Zbog funkcionalno ženskog cvijeta i neredovite oplodnje uz nju se sade i sorte oprašivači. Većinom su to Alicante Bouchet i Trnjak, a u nekim vinogradima kao oprašivač je Žilavka.

Kako je navedeno, u sastavu vina Blatina koristili su se većinom bojadiseri, zatim Skadarka, Plavka, Trnjak, Merlot i Vranac i do 40 % da bi se poboljšala boja vina. Novija istraživanja pokazala su da se može proizvesti čisto sortno vino Blatina, rubin tamnocrvene boje bez dodatka bojadisera i drugih pratećih sorata. Za to se ipak trebaju ispuniti neki uvjeti. U prvom redu treba voditi računa o urodu, urod 6 – 7 tona po hektaru može dati izvrsnu kakvoću grožđa za proizvodnju čistih sortnih vina Blatina, vrhunske kakvoće. Pratiti sadržaj šećera i kiselina i na temelju toga odrediti termin berbe. Puna tehnološka zrelost kod Blatine vrlo je bitna, a prepoznaje se po suhicama na pojedinim bobicama na vrhu grozda. Takvo tehnološki zrelo grožđe u kožici bobice sadržava dovoljnu količinu tvari boje koje mogu osigurati jako dobru obojenost vina. S tako skoro prezrelim grožđem uz uporabu enzima i produženom maceracijom mogu se dobiti jako obojena i strukturna vina sa sadržajem alkohola iznad 13 % vol. i više i ukupnom kiselošću 5,5 – 6 g/L. Takva vina imaju potencijala za njegu u hrastovim ili *barrique* bačvicama gdje odležavanjem dvije do tri godine dobiju na kakvoći.

Maceracija masulja jedna je od važnijih vinarskih postupaka koja može utjecati na dobru obojenost vina, posebice na koncentraciju antocijana i kakvoću crnih vina. Provedeno je istraživanje u cilju utvrđivanja promjene u osnovnom kemijskom sastavu, koncentraciji antocijana i senzornim svojstvima vina Blatina dobivenih maceracijom masulja u dužini od 4, 6, 12 i 16 dana. Rezultati upućuju da je duže vrijeme maceracije pozitivno utjecalo na kakvoću vina Blatine. U vinima Blatine dobivenim nakon 12 i 16 dana maceracije značajno je povećan sadržaj ekstrakta, pepela i ukupnih fenola te pH-vrijednosti. Utvrđeno je da se povećala koncentracija ukupnih i pojedinačnih antocijana do 12 dana maceracije. Organoleptički najbolje su ocjenjena vina Blatine dobivena nakon 16 dana maceracije (Herjavec i sur. 2012.).

declared the best red wine in Yugoslavia at the Novi Sad Fair (Kovacina, Pedisa, 1987).

The Blatina wine has long been well-known in the local and foreign markets. At the Adriatic wine show in Split in 1954, First Herzegovinian wine show at the International Trade Show in Novi Sad in 1964, 1965, 1966, 1967, 1969 and 1971, this wine was awarded gold medals, silver medals and quality certificates.

These days, many Blatina variety vineyards have been planted in the area of Herzegovina. Because of its functionally female flower and irregular fertilization, pollinator varieties are planted close to it. These are mainly Alicante Bouchet and Trnjak, and in some vineyards Zilavka is the pollinator.

As noted, mainly tenturiers, then Skadarka, Plavka, Trnjak, Merlot and Vranac were used up to 40% in composition of the Blatina wine in order to improve the color of the wine. More recent studies have shown that it is possible to produce pure sortal Blatina wine, in dark ruby red color without adding teinturiers or other support varieties. However, some conditions need to be satisfied for that. It is necessary primarily to take account of the crop, a yield of 6 to 7 tons per hectare may give an exceptional quality of grapes for production of pure sortal Blatina wines of premium quality. To monitor the content of sugars and acids and determine the date of harvest based on that. Full technological ripeness is very important in Blatina, and it is recognized by dryness of some berries on tops of bunches. Such technologically ripe grapes contain in berry cuticles a sufficient quantity of substances that can ensure a very good coloration of wine. With so almost overripe grapes, with the use of enzymes and prolonged maceration, it is possible to obtain very colored and structural wines with alcohol content above 13% vol. and higher, and total acidity of 5.5 to 6 g/L. Such wines have a potential for curing in oak or Barrique little barrels where they gain in quality by aging for two to three years.

Maceration of must is one of the most important winemaking processes that can have an effect on good coloration of wine, especially on concentration of anthocyanins and quality of



Slika 38. Boce Blatine i Žilavke kakve su darovane papi Ivanu Pavlu II za vrijeme njegova drugog pastoralnog pohoda Bosni i Hercegovine (Banja Luka 22.6.2003.)

Figure 38. The bottles of Blatina and Zilavka like ones gifted to Pope John Paul II during his second pastoral visit to Bosnia and Herzegovina (Banja Luka, 22 June 2003)

Vinske marke u Hercegovini

Na prostorima bivše države među prvim vinima koja su zaštićena kao vrhunska su Žilavka Mostar (1970.) i Blatina Mostar (1973.). Trebalo je zatim proći oko 10 godina da bi zemljopisnu zaštitu dobila i ostala vina tadašnjega HEPOK-a. Od bijelih vina to su Žilavka – kvalitetno bijelo suho vino koje je u svom sastavu imalo 70 % Žilavke i 30 % Krkošije i Bene u Vinariji *Mostar*; Samotok – kvalitetno bijelo suho vino sa 60 % Žilavke i 40 % Krkošije, Bene i Smederevke u Vinariji *Stolac*; Mostarka – kvalitetno bijelo suho vino sa 70 % Žilavke s pratećim sortama Benom i Krkošijom i 30 % Smederevke u Vinariji *Mostar*; Herceg – kvalitetno bijelo polusuho vino sa 70 % Žilavke i 30 % Krkošije i Bene u Vinariji Čitluk; Hercegovačko stolno bijelo sa 70 % Žilavke s pratećim sortama i 30 % Smederevke u Vinariji *Čitluk*.

Kameno – vrhunsko suho vino, zaštićeno 1990. godine, danas je najpoznatija Žilavka dobivena od birana grožđa iz Kamenih vinograda u Blizancima.

Poslije Blatine Mostar u Vinariji Ljubuški proizvodila su se sva ostala crna vina sa zaštićenim podrijetlom: Crnjak – kvalitetno crno suho vino sa 70 % Blatine, Vranca i Trnjka i 30 % Plavke; Samotok crni – kvalitetno crno polusuho vino s 50 % Blatine, 30 % Vranca i po 10 % Merlota i Gamaya; Muškat Hamburg – kvalitetno crno polusuho vino dobiveno od sorte Muškat Hamburg; Bogumil – crno suho stolno vino dobiveno od sorata grožđa s plantažnih vinograda koje se ne može upotrijebiti za kvalitetna vina, te grožđe sorata Trnjak, Kadarun i Plavka otkupljeno od individualnih proizvođača.

Merlot – vrhunsko suho crno vino dobiveno od istoimene sorte, a zemljopisno podrijetlo mu je zaštićeno 1990. godine i proizvodilo se u Vinariji *Ljubuški*.

Sredinom devedesetih godina prošloga stoljeća nakon otvaranja manjih i modernih podruma većina je zatražila i dobila zaštitu svojih vina. To su prvenstveno vina autohtonih sorata Žilavke i Blatine, a uz sortno ime nosila su i neki pridjev ili svojstvo s položaja gdje se proizvodi grožđe.

Uz autohtone i udomaćene prijeratne sorte počele

red wines. A research was performed in order to determine changes in the basic chemical composition, concentration of anthocyanins and sensory properties of the Blatina wines that resulted from maceration of must during 4, 6, 12 and 16 days. The results indicate that longer maceration had a positive effect on the quality of the Blatina wine. In Blatina wines obtained after 12 and 16 days of maceration, contents of extract, ash and total phenols as well as pH were significantly increased. It was established that concentrations of total and individual anthocyanins was increasing up to 12 days of maceration. Blatina wines produced after 16 days of maceration were assessed as the best in organoleptic terms (Herjavec et al. 2012).

Wine brands in Herzegovina

Among the first wines that were protected as premium quality wines in the area of the former Yugoslavia are Zilavka Mostar (1970) and Blatina Mostar (1973). Then, it should have taken about 10 years for other wines of the then Hepok to get geographical protection. Among the white wines these were Zilavka - a quality dry white wine that consisted of 70% of Zilavka and 30% Krkosija and Bena in the Mostar Winery; Samotok - quality dry white wine with 60% Zilavka and 40% Krkosija, Bena and Smederevka in the Stolac Winery; Mostarka - quality dry white wine with 70% Zilavka with supporting varieties Bena and Krkosija and 30% Smederevka in the Mostar Winery; Herceg - quality semi-dry white wine with 70% Zilavka and 30% Krkosija and Bena in the Citluk Winery; Hercegovinian table white wine with 70% Zilavka with accompanying varieties and 30% Smederevka in the Citluk Winery.

Kameno – premium quality dry wine, protected in 1990, is presently the best-known Zilavka produced from selected grapes of Kameni (Rocky) vineyards in Blizanci.

After Blatina Mostar, the Ljubuski Winery produced all other red wines with protected origin: Crnjak - a quality dry red wine with 70% Blatina, Vranac and Trnjak and 30% Plavka; Samotok crni - quality semi-dry red wine with 50% Blatina, 30% Vranac and 10% Merlot and Gamay each; Muskat Hamburg - quality semi-dry

su se početkom 21. stoljeća podizati vinogradi s introduciranim svjetskim sortama: Chardonnay, Cabernet Sauvignon, Syrah, Plavac mali, Pošip bijeli. Vina dobivena od navedenih sorata uglavnom nose ime sorte od koje su proizvedena.

U novije vrijeme rade se pokusi s autohtonim i introduciranim sortama da bi se poboljšala kakvoća vina kod onih autohtonih i udomaćenih sorata koja nemaju veliki potencijal.

Na kraju je vrijedno spomenuti da je u Vinariji *Zadro* u Domanovićima proizveden prvi hercegovački pjenušac Domano na bazi sorte Žilavka, a Vinarija *Čitluk* krajem godine pustit će u promet pjenušac u čijoj kompoziciji svoj udio ima autohtona Žilavka i introducirani Chardonnay u istom omjeru.

Na području sjeverne Bosne proizvode se vina od različitih introduciranih sorata koje se gaje na tom području: Riesling, Graševina, Chardonnay, Sauvignon, Cabernet Sauvignon, Pinot blanc, Pinot noir, Merlot, Frankovka i druge



Slika 39. Ovako se nekada radilo
Figure 39. This is how it used to be done

red wine made of the Muscat Hamburg variety; Bogumil dry red table wine produced from grape varieties from plantation vineyards that cannot be assigned a quality category and from grapes purchased from individual producers, mainly Trnjak, Kadarun and Plavka.

Merlot - premium quality dry red wine made of the same-named variety, and its geographical origin was protected in 1990 and it was produced in the Ljubuski winery.

In the middle of 1990s, after opening of smaller and modern cellars, most of them applied for and were granted protection for their wines. These were primarily the wines of autochthonous varieties Zilavka and Blatina, and their sortal names were accompanied by adjectives or attributes of sites where the grapes were produced.

In addition to autochthonous and domesticated pre-war varities, in the beginning of the 21st century vineyards with introduced world varieties started to be planted: Chardonnay, Cabernet Sauvignon, Syrah, Plavac mali. Wines produced from the said varieties mainly bear names of the varieties from which they were produced.

Experiments have been conducted recently with autochthonous and introduced varieties to improve the quality of wine in those autochtonous and domesticated varieties that do not have a big potential.

At the end, it is worth mentioning that the first Herzegovinian champagne “Domano,” based on the Zilavka variety, is produced in the Winery Zadro in Domanovici, while at the end of the year the Citluk Winery will launch a champagne whose composition includes the autochthonous variety Zilavka and the introduced Chardonnay in the same proportion.

In the area of northern Bosnia, wines of various introduced and locally grown cultivars are produced: Riesling, Graševina, Chardonnay, Sauvignon, Cabernet Sauvignon, Pinot blanc, Pinot noir, Merlot, Frankovka and others.

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STANJE, MOGUĆNOSTI I PERSPEKTIVE RAZVOJA VINOGRADARSTVA I VINARSTVA

Vinogradarstvo i vinarstvo u Strategiji razvoja BiH

Marko Ivanković

Vinogradarstvo i vinarstvo u Bosni i Hercegovini razvilo se u južnom dijelu države uglavnom na malim gospodarstvima. U proizvodnom je smislu rajon[1] sjeverne Bosne praktično bio zapostavljen. Tek u posljednjih desetak godina javljaju se pojedini proizvođači koji podižu vinograde na više od 1 ha, tako da broj novopodignutih vinograda stalno raste. Godine 1990. stanje vinograda bilo je sljedeće:

- *BiH je imala 5.781 ha vinograda ili*
- *24,50 milijuna trsova europske vinove loze cijepljene na američku podlogu.*
- *Na vinogradarski rajon Hercegovine otpadalo je 5.691 ha vinograda ili 98,4 %, a na rajon sjeverne Bosne 90 ha ili 1,6 %.*

U Strategiji razvitka poljoprivrednoga sektora postavljen je dugoročni cilj razvitka vinogradarstva i vinarstva u Bosni i Hercegovini. Taj cilj od oko 10.000 ha trebalo bi ostvariti do eventualnoga ulaska Bosne i Hercegovine u punopravno članstvo Europske unije.

BiH ima dobre zemljišne i klimatske uvjete da svoje vinogradarstvo uveća širenjem na novepovršine u Hercegovini kao i vraćanjem nasada na davno napuštena područja sjeverne Bosne. Ukoliko se iskažu interesi investitora i utvrde tržišta za plasman proizvoda, to vinogradarstvo moglo bi u doglednom vremenu dostići i površine od 10 do12 tisuća ha.

1 BiH je podijeljena na dva vinogradarska rajona: sjeverne Bosne i Hercegovine. Rajon sjeverne Bosne čine tri vinogorja: Kozaračko, Ukrinsko i Majevičko. Rajon Hercegovine dijeli se na dva podrajona: a) podrajon srednje Neretve i Trebišnjice s Mostarskim i Širokobriješkim vinogorjem, te b) podrajon Rame s Jablaničkim vinogorjem.

STATUS, POSSIBILITIES AND PERSPECTIVES OF VITICULTURE AND WINEMAKING

Viticulture and wine production in the B&H development strategy

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In the southern part of BiH, viticulture and wine production developed mainly on small farms. In terms of production, the zone[1] of north Bosnia was practically neglected. It is only in the last ten years that some producers plant vineyards larger than 1 ha, so the number of new vineyards is constantly growing. In 1990, the state of vineyards was the following:

- *BiH had 5,781 ha of vineyards or*
- *24.50 million vines of European grapevines grafted on American rootstocks,*
- *The wine-growing zone of Herzegovina accounted for 5,691 ha of vineyards, or 98.4%, and the northern Bosnia zone 90 ha or 1.6%.*

The Strategy of development of the agricultural sector in the Federation of Bosnia and Herzegovina (2006-2010) set a long-term goal for development of viticulture and winemaking in Bosnia and Herzegovina. The goal of about 10,000 ha should be achieved by the eventual accession of Bosnia and Herzegovina to full EU membership.

BiH has good soil and climate conditions to increase its viticulture by spreading in new areas of Herzegovina and by restoring the long abandoned plantation areas of Northern Bosnia. If investors express interest and we establish markets for products, that viticulture could reach an area of 10-12 thousand ha in the foreseeable future. This would bring BiH significantly

1 BiH is divided into two wine-growing zones: North Bosnia and Herzegovina. The zone of North Bosnia consists of three wine-growing regions: Kozara, Ukrina and Majevica. The Herzegovina zone is divided into two subzones: the subzone of Neretva and Trebišnjica with Mostar and Široki Brijeg wine-growing regions, and the subzone of Rama with the Jablanica wine-growing region

Time bi se Bosna i Hercegovina bitno približila vinogradarskim površinama kakve danas ima Slovenija i smanjila višestruku razliku u odnosu na Hrvatsku.

Izvor: Srednjoročna strategija razvitka poljoprivrednoga sektora u Federaciji Bosne i Hercegovine (2006. – 2010.) i Strategija razvoja poljoprivrede Republike Srpske (2009. – 2015.)

Navedeni dokumenti osim toga daju mnoštvo preporuka za razvitak sektora poljoprivrede, pa tako i za razvitak vinogradarstva. Za potrebe ovoga dokumenta navodimo najvažnije:

- Vinova loza i dalje će ostati povijesnim gospodarskim žigom Hercegovine, ali bi mogla pojačati svoju prisutnost i u davno napuštenim predjelima sjeverne Bosne.
- Analize tržišta stolnoga grožđa pokazuju da je sadašnja razina potražnje veća od ponude i taj proces treba ubrzati. To bi vodilo podizanju vinograda stolnih sorata s ukupnom površinom od oko 900 ha.
- Jednako je stanje i s vinskim sortama, pa bi takva dinamika dovela u pitanje ne samo obnovu, nego i prijeko potreban kvalitetan zaokret u budućem razvitku te grane.
- U prvom se stupnju razvitka vinogradarstva potrebno vratiti na predratnu razinu proizvodnje (5.781 ha) s omjerom sorata, bijele : crvene, 60 : 40.
- Neupitno: oslonac na izvorne (autohtone) kultivare Žilavka i Blatina, koje na sve zahtjevnijem tržištu vina upravo svojom posebnom i nigdje ponovljenom autohtonošću ne bi trebale imati konkurenciju.
- Uz njih bi se trebalo nastaviti s pojačanom sadnjom i svjetskih poznatih sorata Merlot, Cabernet Souvignon i Chardonnay, te s njima kompletirati (i poboljšati) izvoznu ponudu. Te su se sorte već udomaćile na hercegovačkom podneblju i postižu visoku kakvoću proizvoda.
- Na području sjeverne Bosne treba nastaviti s podizanjem novih nasada vinove loze, vodeći i dalje računa da se odabere odgovarajući sortiment. To bi trebale biti sorte koje su otporne na niske temperature i imaju kraće vegetacijsko razdoblje, odnosno bijele vinske sorte podrijetlom iz Europe kao i crne vinske sorte koje prispijevaju u prvoj i drugoj epohi

closer to present wine-growing areas in Slovenia and decrease the large difference in relation to Croatia.

Source: Mid-Term Development Strategy of the agricultural sector in the Federation of Bosnia and Herzegovina (2006-2010), the Development Strategy of agriculture of the Republic of Srpska (2009 – 2015).

In addition, these documents provide a variety of recommendations for development of the agricultural sector, including the development of viticulture. For the purposes of this document, we mention the most important ones:

- Grapevine will remain the historic economic mark of Herzegovina, but it its presence in the long-abandoned areas of northern Bosnia could be increased,
- Market analysis of table grapes indicates that the current level of demand exceeds supply and this process needs to be accelerated. This would lead to setting up of table grape vineyards in the total area of about 900 ha,
- Situation is the same with wine grape varieties and such developments would bring up the issue of not only restoration, but also indispensable quality shift in the future development of this branch,
- In the first stage of development of wine-growing, it is necessary to restore the pre-war production levels (5781 ha) with a ratio of red and white varieties (60:40)
- Unquestionably: reliance on the original (autochthonous) cultivars Zilavka and Blatina, which by its special and unparalleled autochthony should not have any competition in a challenging wine market,
- In addition to these, increased planting of world famous varieties Merlot, Cabernet Sauvignon and Chardonnay should be continued, thereby completing (and improving) the export supply. These varieties are already domesticated in the Herzegovinian climate and achieve a high quality of products,
- In the area of Northern Bosnia, planting of new grapevine plantations should continue, taking care to select appropriate varieties. That should be the varieties that are resistant to low temperatures and with a short growing season, i.e. white wine varieties that originate



Slika 40. Međugorje, poznato svetište i veliki potrošački centar
Figure 40. Medjugorje, the famous pilgrimage and consumption center

sazrijevanja.

- Da bi se izbjegli veći promašaji pri podizanju vinograda, potrebno je formirati kolekcijski nasad s više sorata koje bi se detaljno ispitale na tom području, a nakon toga s najboljim sortama pristupalo podizanju vinograda.
- Danas tih nasada već ima na nekoliko lokaliteta sjeverne Bosne i podižu se uz stručnu suradnju. To pokazuje da tu kulturu prihvaća lokalno stanovništvo, što bi moglo biti dobrim znakom za njezino buduće još masovnije uzgajanje na tim prostorima.
- Da se dostignu postavljeni ciljevi povratka i rasta proizvodnih površina, u što kraćem roku treba definirati položaj te grane i u njoj status vina kao prehrambenoga proizvoda, te donijeti sljedeće dokumente i mjere:
  - *Zakon o vinu BiH i podzakonske akte (pravilnike).*
  - *Program razvitka vinogradarstva sukladno ulasku BiH u EU.*
  - *Definirati bliže lokalitete širenja vinogradarstva sukladno namjeni i sortimentu.*

from Europe as well as red wine varieties that ripen in the first and second epoch..

- To avoid major failures in vineyard plantations, is necessary to establish a collection nursery with a number of varieties that would be thoroughly tested in the particular area, and then establish vineyards with the best varieties.
- These plantations have already been present at several localities in northern Bosnia, and they are planted in collaboration with experts in this field. This shows that this crop is accepted by the local people, which could be a good sign for its future and larger-scale cultivation in this region,
- To achieve the set objectives of restoration and expansion of production areas, it is necessary as soon as possible to define the position of the branch and the status of wine as a food product in it, and enact the following documents and measures:
  - *Wine Act of BiH and bylaws (regulations),*
  - *Viticulture development program in*

- *Odrediti dugoročne potrebe loznoga sadnog materijala za BiH.*
- *Oživiti znanstvenu djelatnost u području vinove loze te definirati i ustrojiti ogledne prostore.*
- *Stvoriti banku gena autohtonih sorata vinove loze.*
- *Uspostaviti akreditiranu Agenciju za vinogradarstvo i vinarstvo BiH pri Europskoj komisiji u Bruxellesu.*
- *Poduzeti mjere za usklađivanje postojećih i budućih zakona s direktivama EU.*
- *Školovati specijalističke kadrove za vinogradarstvo i vinarstvo.*

– Sa svim time stvorili bi se temeljni uvjeti za brži razvitak te djelatnosti u BiH kao i reguliralo njezino članstvo u međunarodnoj organizaciji za vino i vinovu lozu (OIV).

– Sve predložene mjere trebale bi rezultirati približavanjem vinogradarstva prema ranijim površinama od nepunih 5.800 ha. Uz nužno podizanje proizvodnosti, sve bi to trebalo biti prvim korakom u izradi jedne *dugoročnije projekcije razvitka* koja bi vodila širenju te djelatnosti, *i to na osjetno veće površine od onih iz devedesetih godina prošloga stoljeća,* odnosno na one na koje bi ukazali potencijali domaćega tržišta i realne mogućnosti izvoza.

– U drugom razvojnom koraku bilo bi poželjno dostići razinu od 10 do 12 tisuća ha vinograda.

U dokumentu *Analiza vinskog sektora BiH*[2] predstavljena je detaljna analizu trenutačna stanja vinskoga sektora u Bosni i Hercegovini. Dokument doprinosi utvrđivanju stvarnih okolnosti u sektoru vinarstva, te daje preporuke za donošenje politika koje će doprinijeti poboljšanju uvjeta za vinogradarsko-vinarski sektor na domaćem tržištu, u kombinaciji s pravodobnim djelovanjem u smjeru osvajanja novih izvoznih tržišta.

Analiza obuhvaća programsko razdoblje od deset godina, 2012. – 2021. U tablici 14. predstavljene su vrijednosti postojeće situacije, kao i vrijednosti ciljne situacije koje bi se trebale ostvariti u 2021. Kao osnova za izračune uzet je broj hektara koji

2 Vinski sektor u BiH, Priprema IPARD-ove analize sektora u Bosni i Hercegovini GCP/BIH/007/EC, broj ugovora: 2010/256-560, Podregionalni ured za Centralnu i Istočnu Europu.

- *accordance with the accession of BiH to the EU,*
- *To identify immediate locations for expansion of viticulture in consistence with the purpose and variety,*
- *To determine long-term needs of vine planting material for BiH,*
- *To revive the scientific work in the field of vines and define and establish the experimental areas,*
- *To create the gene bank of autochthonous grape varieties, and*
- *To establish the accredited Agency for Viticulture and Oenology of BiH at the European Commission in Brussels,*
- *To take measures for harmonization of the existing and future legislation with the EU directives, and*
- *To educate specialist staff for viticulture and oenology.*

– All of this should create the basic conditions for a rapid development of this sector in BiH, as well as regulate its membership in the International Organization for Wine and Vine (OIV),

– All the proposed measures should result in a shift towards the earlier areas of nearly 5,800 ha of vineyards. Along with the necessary improvement of productivity, all this should be the first step in preparation of a long-term development projection that would lead to expansion of the activity to areas significantly larger than those in 1990s, specifically those that would be indicated by potentials of the domestic market and real export possibilities.

– In the second development step, it would be desirable to reach a level of 10-12 thousand hectares of vineyards.

The document "Analysis of the wine sector in BiH"[2] presents a detailed analysis of the current state of the wine sector in BiH. The document helps to identify the actual circumstances in the wine sector and makes recommendations for adoption of policies that will contribute to

2 Wine sector in BiH, Preparation of IPARD analysis the sector in Bosnia and Herzegovina GCP/BIH/007/EC, Contract Number: 2010/256-560, Sub-Regional Office for Central and Eastern Europe



Slika 41. Hutovo Blato
Figure 41. Hutovo Blato

se koriste za proizvodnju grožđa.

Površine pod vinogradima, koje se koriste za proizvodnju grožđa *registriranih poljoprivrednika* i domaćinstava, porasle su sa 1.296 ha (2011.) na 10.000 ha u 2021. To je jednako povećanju u broju hektara od 6.700 ha ili oko 650 hektara godišnje. To znači komercijalizaciju i profesionalizaciju primarne proizvodnje grožđa, s obzirom na to da je odnos između registriranih i neregistriranih proizvođača 40 : 60, i za deset godina, situacija će postati 100 : 0. Dakle, cilj je da 2021. ne postoje neregistrirani proizvođači. Očekuje se da će povećanje obuhvatiti 200 poljoprivrednika od čega svaki ulaže u 3 – 4 ha novoga vinograda godišnje u razdoblju od 10 godina, ili 2.000

improvement of conditions for the wine-growing and wine sector in the domestic market, coupled with timely action towards gaining new export markets.

The analysis covers the programming period of ten years, 2012-2021. Table 14 presents the values of the current situation, as well as the value of the target situation that should be achieved in 2021. The calculations are based on hectares used for production of grapes.

Vineyard areas used for production of grapes of registered farmers and households increased from 1,296 ha (2011) to 10,000 ha in 2021. This is equivalent to an increase of 6,700 hectares or about

Tablica 14: Definirane početne vrijednosti i ciljne vrijednosti za proizvodnju grožđa i vina
Table 14. Defined baselines and targets for production of grapes and wine

Stavka Item	Stanje 2011. 2011 baseline	Scenarij 1.: Investicijski plan za sektor, 2021. Investment plans for the sector, 2021	Scenarij 2.: Vizija 2021. Vision 2021
Registrirani proizvođači, ha Registered wine producers, ha	1.296	3.300	10.000
Neregistrirani proizvođači, ha Unregistered wine producers, ha	1.944	944	0
Registrirana proizvodnja, l Registered wine production, l	5.897 000	15.015 000	45.500 000
Neregistrirana proizvodnja, l Unregistered wine production l	8.845 000	4.295 000	0
Vrijednost registrirane proizvodnje, KM Value of registered production, KM	26.467 600	67.568 000	204.750 000
Vrijednost neregistrirane proizvodnje, KM Value of unregeistered production, KM	39.803 400	19.328 000	0
Ukupna vrijednost proizvodnje vina, KM Total value of wine production, KM	66.271 000	86.896 000	204.750 000

Izvor: Izračuni autora, preuzeto iz dokumenta „Analiza sektora vina u BiH“, str 97.
Source: Authors' calculations, taken from the document "Analysis of the wine sector in BiH", page 97

poljoprivrednika koji će to učiniti za samo godinu dana. Provedba predložena programa bit će vjerojatno negdje između te dvije krajnosti. U svakom slučaju, treba uzeti u obzir da samo mali broj poljoprivrednika i domaćinstava uzgajaju grožđe na površinama većim od 1 ha: oko 400, a od toga, samo 200 uzgaja grožđe na površinama većim od dva ha.

Povećanje površina za proizvodnju grožđa rezultirat će ukupnom količinom od 45,5 milijuna litara vina iz registriranih vinarija, ako se očekuje da će prinos biti konstantan (7.000 kg grožđa po ha) i da je stopa iskorištenosti po kilogramu grožđa ujednačena. Treba planirati porast prinosa po hektaru najmanje na razini susjednih zemalja, a ako proizvođači u BiH na primjer postignu 8.000 kg po ha kao u Crnoj Gori, potražnja za hektarima će se smanjiti te tako i potreba za ulaganjima.

Kako bi se preradila ta količina grožđa, sektor registriranih vinarija mora se proširiti s trenutačne proizvodnje od 5,4 milijuna litara vina od ukupno 46 registriranih vinarija, s prosječnom proizvodnjom od oko 120.000 litara godišnje. Kapacitet je toga sektora trenutačno 25 milijuna litara. Kako bi se ostvarila očekivana proizvodnja grožđa, potrebno je ulagati u proširenje kapaciteta postojećih vinarija i otvaranje novih. Trideset

650 ha per year. This involves commercializing and professionalizing of the primary production of grapes considering that the ratio between registered and non-registered producers is 40:60, and the situation will become 100:0 in ten years. Thus, the goal is that there are no unregistered producers in 2021.

The increase is expected to include 200 farmers, of which each invests in 3-4 hectares of new vineyards annually in a period of 10 years, or 2,000 farmers who will do so in only one year. Implementation of the proposed program will probably be somewhere between the two extremes. Anyway, it should be taken into account that only a small number of farmers and households grow grapes on areas exceeding 1 ha; about 400, out of which only 200 grow grapes on areas larger than 2 ha.

Increasing the areas for production of grapes will result in a total amount of 45.5 million litres of wine from registered wineries, if yield is expected to be constant (7000 kg of grapes per ha) and utilization rate per kilogram of grapes is uniform.

It is necessary to plan an increase in yield per hectare at least at the level of the neighbouring countries, and if producers in BiH reach e.g. 8,000

novih vinarija s prosječnom proizvodnjom od 500.000 litara godišnje, i unapređenje postojeće proizvodnje postojećih vinarija sa 120.000 litara na 250.000 litara u prosjeku godišnje, pokrit će proizvodnju grožđa. To znači da se od 2012. svake godine treba ulagati u tri nove vinarije.

Da bi se omogućila prodaja te količine vina, potrebno je značajno povećati izvoz. Povećanje domaće potrošnje vina s pet na deset litara po glavi stanovnika, što je i dalje ispod vrijednosti u ostalim zemljama regije, dovest će do povećanja u potražnji, ali iskustva iz novih zemalja članica svjedoče da se nakon stjecanja članstva povećava uvoz vina.

Stoga je potrebno povećanje izvoza u susjedne zemlje i EU. Ako se uvoz vina povećava s 8,7 milijuna litara na 13 milijuna litara, što je povećanje od 50 %, potrebno je ostvariti naglo povećanje izvoza s postojećih tri milijuna na 24 milijuna litara, što je osam puta više od trenutačne vrijednosti. To povećanje treba ostvariti na novom tržištu.

U tablici 15. dana je kvantifikacija polaznih

kg per hectare like in Montenegro, the demand for hectares, and thereby the need for investments, will decrease.

In order to process this quantity of grapes, the sector of registered wineries must expand from the current production of 5.4 million litres of wine in the total of 46 registered wineries, with an average production of about 120,000 liters per year. The capacity of this sector is presently 25 million litres. In order to achieve the expected grape production, it is necessary to invest in expansion of capacities of the existing wineries and in opening of new ones. The production of grapes will be covered by 30 new wineries with an average production of 500,000 litres per year and improvement of present production of the existing wineries from 120,000 litres to 250,000 litres on the average per year. This means that it is necessary to invest in three new wineries every year from 2012.

In order to facilitate sales of this quantity of wine, exports should be significantly increased. Increasing the domestic consumption of wine from 5 to 10 litres per capita, which is still below



Slika 42. Tradicionalna berba
Figure 42. Traditional harvesting

Tablica 15. Kvantifikacija polaznih i ciljnih vrijednosti za trgovinu i potrošnju[3]
Table 15. Quantification of baseline and target values for trade and consumption[3]

Stavka **Item**	**2011.**	**Scenarij 1.: Investicijski plan i ciljevi za sektor** **Investment plans and targets for the sector**	**Scenarij 2.: Vizija 2022.** **Vision 2022**
Proizvodnja vina, l Wine production, liters	13.413 400	19.310 000	45.500 000
Izvoz, l Export, liters	2.962 244	6.000 000	24.000 000
Uvoz, l Import, liters	8.715 466	13.000 000	13.000 000
Za domaću potrošnju, l Domestic consumption	19.166 622	26.310 000	34.500 000
Populacija, broj Population, number	3.447 156	3.447 156	3.447 156
Domaća potrošnja, l per capita Domestic consumption, l per capita	5.56	7.63	10.00

Izvor: Izračuni autora, preuzeto iz dokumenta „Analiza sektora vina u BiH", str 98.
Source: Authors' calculations, taken from the document "Analysis of the wine sector in BiH", page 98

i ciljnih vrijednosti za trgovinu i potrošnju, a također su postavljeni ciljevi razvitka sektora do 2021. godine

Za postizanje tih ciljeva nužno je ispuniti neke pretpostavke među kojima su:

a. **Usvajanje Zakon o vinu na razini države.**
b. **Usklađena i učinkovita kontrola izvoza i uvoza, eliminiranje nezakonitoga uvoza i prerade grožđa i vina.**

Najveći problem predstavlja izvoz na tržište Republike Hrvatske, jer se uvozno vino podvrgava organoleptičkoj senzornoj procjeni vina koju vrši Hrvatski zavod za vinogradarstvo i vinarstvo.

Usvajanje nacrta Zakona o vinu omogućava uvođenje sličnoga sustava unutar Agencije za vinogradarstvo i vinarstvo BiH kojim bi se

3 Potrošnja vina u Republici Srbiji iznosi cca 3,03 litara po stanovniku (Izvor:http://marketnetwork.rs/retail/analiza/1523-kvalitet-se-ne-dokazuje-visokom-cenom). Potrošnja vina je u porastu i to od 22,00 l it. u 2000. na 30,17 l/stanovniku u 2010. godini, ali je još uvijek ispod prosjeka ekonomski razvijenih država EU. Porast potrošnje per capita predviđa se i u narednom razdoblju, a u 2013. godini očekuje se da će biti 36,62 l/ stanovniku. Republici Hrvatskoj cca 20 litara po stanovniku (Izvor: I. Grgić, J. Gugić, Magdalena Zrakić; Samodostatnost Republike Hrvatske u proizvodnji grožđa i vina, Agronomski glasnik, br. 3/2011, ISSN 0002-1954)

the value of the other countries in the region, will lead to an increase in demand, but experiences from new member states are evidence that imports of wine increase after gaining membership.

Therefore, it is necessary to increase exports to neighbouring countries and the EU. If the import of wine increases from 8.7 million litres to 13 million litres, representing an increase of 50%, it is necessary to achieve a rapid increase in exports from the current 3 million to 24 million litres, which is eight times more than the current value. This increase need to be achieved in a negative market.

Table 15 gives the quantification of baseline and target values for trade and consumption[3].

To achieve these objectives, it is necessary to

3 Wine consumption in the Republic of Serbia is about 3.03 l per capita (Source:http://marketnetwork.rs/retail/analiza/1523-kvalitet-se-ne-dokazuje-visokom-cenom). Wine consumption is on the rise from 22.00 l in 2000 to 30.17 l per capita in 2010, but is still below the average of economically developed countries of the EU. Increase in consumption per capita is anticipated in the coming period too and in 2013 it is expected to be 36.62 l per capita. The Republic of Croatia it is about 20 l per capita (Source: I. Grgic, J. Gugić Magdalena Zrakić; Samodostatnost Republike Hrvatske u proizvodnji grožđa i vina (Self-sufficiency of the Republic of Croatia in production of grapes and wine), Agronomski glasnik, no. 3/2011, ISSN 0002-1954)

uveo isti postupak organoleptičke procjene vina uvezena u Bosni u Hercegovinu. Svi zahtjevi po pitanju prostora i opreme već postoje.

a. **Kontrola kakvoće, podrijetla i mogućnosti praćenja.**
b. **Dostupnost visokokvalitetna sadnog materijala, što je jedan od preduvjeta za uspješan razvoj vinogradarskoga i vinskoga sektora.**

Da bi se to postiglo, potrebno je:

- Utvrđivanje dugoročnih potreba za sadnim materijalom vinove loze u BiH,
- Podizanje matičnih nasada;

fulfil certain requirements, including:

a. **Adoption of the Wine Act at the state level**
b. **Adjusted and effective control of exports and imports, elimination of illegal import and processing of grapes and wine.**

The biggest problem is the export to Croatian market, because imported wines are subjected to organoleptic wine sensory assessment carried out by the Croatian Institute of Viticulture and Oenology.

Adoption of the draft Wine Act allows introducing a similar system within the Agency for Viticulture



Slika 43. Mostar, središte vinogorje
Figure 43. Mostar, center of wine growing region

- Oblikovanje „nukleusa“ osnovnoga materijala za kloniranje kao izvora za podizanje plantaža vinove loze. To se djelomično odnosi na korištenje *in vitro* kulture;
- Organiziranje genetskoga i sigurnoga odabira klonova autentičnih domaćih sorata, naročito onih koje predstavljaju bitnu ekonomsku osnovu (Žilavka i Blatina);
- Pomoć rasadnicima za uzgoj kultivara na različitim podlogama s različitim poticajima kako bi se iskoristile najrazličitije vrste tla, na primjer, odabirom odgovarajućih supstrata pogodnih za mnogobrojne klonove kultivara.

Veoma je važan aspekt usklađena regulatornog režima pomoć ulaganjima koja je dostupna poljoprivrednicima i prerađivačima u zemlji, kao i u entitetima i županijama. Preporučuje se jedan uvezani državni sustav koji eliminira regulatorne razlike između entiteta i time doprinosi stvaranju pravične konkurencije u sektoru. Transparentna poljoprivredna politika na razini BiH od ključne je važnosti za taj sektor.

Ostale IPARD-intervencije

Ostale mjere u sklopu IPA-propisa procijenjene su u svjetlu analize sektora. Sudeći po planovima ulaganja u vinarijama, od velike je važnosti podrška *Diversifikaciji aktivnosti koje stvaraju prihode u ruralnim područjima*. Vinarije očekuju bitna ulaganja u vinski turizam, uz iskorištavanje infrastrukture projekta *Vinske ceste Hercegovine*.

Također je stalno prisutna potreba za pomaganjem jačanja kapaciteta vinskoga sektora. *Obuka poljoprivrednih savjetnika i poljoprivrednika,* te radnika u vinarijama je neophodna za praćenje razvoja međunarodnoga vinskog sektora. S jedne strane, sektor se mora oslanjati na vlastitu stručnost i tradiciju, ali s druge strane, treba koristiti međunarodna znanja, gdje god je to relevantno i isplativo. To je naročito važno s obzirom na to da je jasna ambicija sektora poboljšanje proizvodnje vrhunskih vina od autohtonih sorata. Uz upotpunjavanje te ambicije načelima organske i biodinamičke proizvodnje, potrebno je ojačati stručnost i vještine proizvođača na terenu kao i u podrumima. Potrebna je obuka predavača i radnika u sektoru, a podrška se može osigurati

and Oenology of BiH, which would introduce the same procedure of sensory evaluation of wines imported in Bosnia-Herzegovina. All requirements in terms of space and equipment already exist.

a. Control of quality, origin and traceability

b. Availability of high quality planting material, which is one of the prerequisites for the successful development of viticulture and wine sector.

To achieve this it is necessary to:

- Establish long-term needs for planting material of grapevine in BiH
- Establish parent plantations,
- Form a “nucleus” of the base material for cloning as the source for setting up plantations of vines. This is in part related to the use of “in vitro” culture;
- Organize genetic and safe selection of clones of authentic local varieties, especially those that represent a significant economic basis (Zilavka and Blatina);
- Help nurseries for breeding cultivars on different rootstocks with different incentives to take advantage of a wide variety of soil types, for example, by choosing the appropriate substrates suitable for numerous clones of cultivars.

A very important aspect of a harmonized regulatory regime is support to investments that is available to farmers and processors in the country, as well as in entities and cantons/counties. It is recommended to have one integrated state system that eliminates regulatory differences between the entities and thus contributes to creating fair competition in the sector. Transparent agricultural policy at the state level is of crucial importance for this sector.

Other IPARD interventions

Other measures in the framework of IPA regulations are evaluated in the light of the sector analysis. Judging by investment plans in wineries, support to diversification of income-generating activities in rural areas is very important.

putem IPARD- programa.

Suradnja unutar lanca opskrbe nije najbolja, iako sudionici nemaju jednaka viđenja situacije. S obzirom na okolnosti, za širenje na međunarodno tržište, potrebna je jača suradnja među vinarima. *Preporučuje se pružanje podrške osnivanju i radu udruga proizvođača*.

Međunarodno tržište je ključ širenja sektora. Međutim, marketing i promoviranje u inozemstvu relativno su skupi, ali su mogući uz zajedničke napore i suradnju proizvođača. Mogu se preporučiti *organizacije proizvođača* i *pomoć međunarodnom (i domaćem) marketingu*.

Zaključak

Pregledom je strateških dokumenata vidljivo strateško planiranje u sektoru vinogradarstva i vinarstva BiH. Ipak, osim realnoga planiranja i višegodišnjega iščekivanja vinogradara i vinara možemo konstatirati da je većina strateških dokumenata nerealizirana. Najveću pozornost u pregledu strateških dokumenta posvećeno je dokumentu pod naslovom *Analiza vinskog sektora u BiH* koji je urađen uz pomoć FAO-a. Dokument je dao strateške preporuke za daljnji razvitak sektora do 2021. godine. Također, dokument je dao realne izvore financiranja koji su ovdje navedeni.

Sadašnje stanje vinogradarstva u Federaciji BiH

Viktor Lasić

Prema podacima Federalnoga zavoda za statistiku (Tablica 16.) u FBiH ima ukupno 13.493.000 trsova vinove loze s kojih se ubere 22.973 t grožđa. Vinogradarstvo u BiH definirano je temeljnim dokumentom *Rejonizacija vinogradarske proizvodnje BiH*, izrađenim 1977. godine. Prema njemu vinogradarstvo u BiH organizirano je u dva vinogradarska rajona, rajon sjeverne Bosne i rajon Hercegovine, a svaki od njih sastoji se od po tri vinogorja. Granice vinogorja nisu na entitetskoj razini. Samo su dva vinogorja, Jablaničko i Širokobriješko, u potpunosti smještena u Federaciji BiH, dok ostala

Wineries expect significant investments in wine tourism, capitalizing on the infrastructure of the ***Herzegovina Wine Route*** project**.**

A need to help wine sector capacity building is also constantly present. Training of agricultural advisers and farmers and workers in wineries is necessary for monitoring developments of the international wine sector. On the one hand, the sector must rely on its own expertise and tradition, but on the other hand, it should benefit from international knowledge, wherever relevant and profitable. This is particularly important given that the sector has clearly articulated its ambition to improve the production of premium wines from autochthonous varieties. While supplementing this ambition by principles of organic and biodynamic production, it is necessary to strengthen the expertise and skills of producers in the field as well as in cellars. Training of teachers and workers in the sector is necessary, and support can be provided through IPARD.

Cooperation within the supply chain is not the best, although participants do not have equal visions of the situation. Given the circumstances, expansion to international markets requires more cooperation among winemakers. It is recommended to support the establishment and operation of producers' associations.

International market is the key to expansion of the sector. However, marketing and promotion abroad are relatively expensive, but they are possible with joint efforts and cooperation of manufacturers.

Conclusion

Strategic planning in the field of viticulture and winemaking of BiH is evident by reviewing strategic documents. However, except for real planning and years of anticipation of growers and winemakers, we can conclude that the majority of strategic documents are unrealized. In the review of the strategic document, the greatest attention was devoted to the paper entitled "Analysis of the wine sector in BiH", which was developed with the assistance of FAO. The document provides strategic recommendations for further development of the sector until 2021. Also, the

četiri vinogorja obuhvaćaju dijelove oba entiteta, Federacije BiH i Republike Srpske. Federacija BiH administrativno je podijeljena na županije. Na području Hercegovačko-neretvanske županije nalaze se dva vinogorja, Mostarsko i Jablaničko, dok se Širokobriješko vinogorje prostire najvećim dijelom na području Zapadnohercegovačke županije i samo manjim dijelom zahvaća Hercegovačko-neretvansku županiju na prostoru Mostarskoga blata.

Tablica 16. Proizvodnja grožđa u 2012.
Table 16. Production of grapes in 2012.

Godina Year	Broj trsova Number of vines		Proizvodnja grožđa (t) Grapes produced (t)	Urod po trsu (kg) Yield per vine
	Ukupno Total	Rodnih Productive		
2012.	13.493.000	12.075.000	22.973	1,9



Slika 44. Vinograd na kršu
Figure 44. Vineyard on karst

Statistički podaci u Bosni i Hercegovini vode se po entitetima, županijama i općinama, tako da je teško utvrditi kolika je proizvodnja grožđa u pojedinom vinogorju. Prema podacima iz tablice

document gave the real sources of funding that are listed here.

Present state of viticulture in the Federation of Bosnia and Herzegovina

Viktor Lasić

According to data from the Federal Bureau of Statistics (Table 16), there is a total of 13,493,000 grapevines in FB&H from which 22,973 t of grapes are harvested. Viticulture in B&H is defined by the fundamental document "Zoning of viticultural production of BiH", which was made in 1977. According to that document, viticulture in B&H

17. vidljivo je kako se 99,44 % vinogradarske proizvodnje Federacije BiH obavlja u rajonu Hercegovine i to u Mostarskom i Širokobriješkom vinogorju, dok su ostala četiri vinogorja gotovo bez proizvodnje. Stoga je danas vinogradarstvo kao gospodarska djelatnost gotovo isključivo vezana za Hercegovinu.

Tablica 17. Proizvodnja grožđa po županijama za 2012.
Table 17. Production of grape by cantons in 2012

Županija **Canton**	**Ukupan urod (t)** **Total yield (t)**
Hercegovačko-neretvanska Herzegovina-Neretva	19.579
Zapadnohercegovačka West Herzegovina	3.229
Ostale županije Other cantons	123
Ukupno/Total	**22.937**

Podaci o površinama zasađenim vinovom lozom još su uvijek nepouzdani sve dok se na izradi katastar vinogradarstva. Za 2012. godinu nema uopće podataka, a po procjeni autora površine se kreću od 3.500 ha do 4.000 ha (izračun iz odnosa ukupna broja trsova i 3.000 trsa/ha ili 3.500 trsa/ha). Službeni statistički podaci o površinama postoje do 2012. godine i jedan dio njih prikazan je u usporedbi s posrednim izračunima za istu godinu (tablica 18.), što zorno govori o manjkavosti službenih statističkih podataka. Osim navedenih manjkavosti i nedostatna broja statističkih podataka postoji i šarolikost statističkih podataka po različitim ustrojbenim jedinicama države.

is organized in two wine-growing zones, the zone of Northern Bosnia and the zone of Herzegovina, each of them consisting of three wine-growing regions. Limits of wine-growing regions are not at entity levels. Only two wine-growing regions, Jablanica and Siroki Brijeg, are entirely located in the Federation of B&H, while other four wine-growing regions cover parts of both entities, the Federation of BiH and the Republic of Srpska. The Federation of B&H is administratively divided into cantons. There are two wine-growing regions in the area of the Herzegovina-Neretva Canton, Mostar and Jablanica, while Siroki Brijeg wine-growing region stretches mostly in the area of the West Herzegovina Canton and only a small part of it extends to the Herzegovina-Neretva Canton in the area of Mostarsko Blato.

Statistical data in Bosnia and Herzegovina are kept in entities, counties and municipalities, so it is difficult to establish volumes of grapes produced in specific wine-growing regions. According to data from Table 17, it is evident that 99.44% of production of grapes in the Federation of B&H is achieved in the Herzegovina zone, specifically in the Mostar and Siroki Brijeg wine-growing regions, while four other wine-growing regions are almost without production. That is why viticulture as an economic activity is almost exclusively related to Herzegovina.

Data on areas planted with vines are still unreliable until the cadastre of viticulture is completed. There are no data for 2012 at all, and the author estimates that the areas range from 3,500 ha to 4,000 ha (calculation based on the relation of the total number of vines and 3,000 vines/ha or 3,500 vines/ha). Official statistical data on areas exist up to 2012 and a part of them is shown next to

Tablica 18. Nesuglasje statističkih podataka s posrednim izračunima
Table 18. Differences between statistical data and indirect calculations

Godina - Year	**2005. (ha)**	**2010. (ha)**	**2011. (ha)**
BiH statistika **B&H statistics**	nema podatka no data	5.000	nema podatka no data
FBiH statistika **FB&H statistics**	5.200	5.500	5.100
Posredni izračun **Indirect calculation**	2.100	3.300	3.500

U vinogradarskom rajonu Hercegovine uglavnom se uzgajaju autohtone sorte Žilavka i Blatina, te njihove prateće sorte. To su: Krkošija, Bena i Dobrogostina od bijelih odnosno Alicante Bouschet i Trnjak od crnih. Te sorte pokrivaju više od 80 % ukupnih površina. Od stranih sorata posebno se uzgajaju Vranac, najviše u okolici Trebinja, ali se širi i na ostala područja Hercegovine, zatim Smederevka, Merlot, Skadarka. U posljednje vrijeme uvode se poznate sorte Cabernet Sauvignon, Chardonnay, Syrah, Graševina, Plavac mali. Na taj način proširuje se asortiman proizvoda, ali dominantni i dalje ostaju Žilavka i Blatina kao hercegovački brend.

Površine pod vinskim sortama postupno se povećavaju, ali je zabrinjavajući pad stolnih sorata posljednjih dvadesetak godina. Početkom devedesetih godina 20. stoljeća bilo je skoro 1.000 ha stolnih sorata, a danas te površine, po procjeni autora iznose oko 300 ha, a proizvede se oko 550 t stolnoga grožđa. Najčešće su sorte stolnoga grožđa: Kardinal, Kraljica vinograda, Afus Ali, Demir Kapija, Italija i u manjoj mjeri Black magic, Viktoria, Moldova i druge. Po podacima Vanjskotrgovinske komore BiH iz 2007. godine, godišnji uvoz stolnoga grožđa je 4.355 t, što govori

indirect calculations for the same year (Table18), which realistically shows the deficiency of official statistical data. In addition to the said deficiency and insufficient numbers of statistical data, there is also a diversity in statistical data in various organizational units of the state.

In the wine-growing zone of Herzegovina, autochthonous varieties Zilavka and Blatina, as well as their supporting cultivars, are mostly grown. Those are white wines Krkosija, Bena and Dobrogostina and red wines Alicante Bouschet and Trnjak. These cultivars cover more than 80% of total areas. The most commonly grown foreign cultivars are Vranac, mostly near Trebinje but also spreading out to other areas of Herzegovina, then Smederevka, Merlot, Skadarka. Well-known cultivars Cabernet Sauvignon, Chardonnay, Syrah, Grasevina, Plavac mali are being introduced recently. Range of cultivars is thus expanding, but Zilavka and Blatina remain dominant as the brand of Herzegovina.

Areas of vineyards gradually increase, but a decrease of table cultivars in the last about twenty years gives cause for concern. In the early 1990s, there were nearly 700 ha table cultivars, while these days those areas are about 300 ha, as



Slika 45. Jesen u vinogradu
Figure 45. Vineyard in autumn

o velikom nerazmjeru proizvodnje i potrošnje. U Bosni i Hercegovini postoje povoljni uvjeti i potencijalne površine za uzgoj sorata stolnoga grožđa i povećanje proizvodnje stolnoga grožđa trebalo bi biti jedno od strateških opredjeljenja za razvoj poljoprivrede kako bi se što je moguće više uravnotežila proizvodnja i potrošnja.

Na području Hercegovine postoje tri lozna rasadnika (matičnjaka). Dva su privatna na području Čapljine, svaki po 2 ha površine i oni proizvode standardni sadni materijal. Treći suvremeni rasadnik u općini Ravno u Popovu polju ima površinu od 4 ha i proizvodi certificirani sadni materijal. U tim rasadnicima proizvode se podloge koje se najčešće koriste u Hercegovini: Kober 5BB, Paulsen 1103, Richter 109, Richter 110, Ruggeri 140, 161-69 Couderc i 41B. Prema procjeni autora na prostoru FBiH proizvede se oko 400.000 kvalitetnih loznih cijepova godišnje.

U proizvodnji i potrošnji vina također postoji neravnoteža. Godišnja proizvodnja vina u Bosni i Hercegovini je oko 10.000.000 l, a godišnji uvoz je 10.277.297 l. Prema istraživanjima skupine autora za potrebe izrade strategije poljoprivrede za Federaciju BiH, podaci o proizvodnim i skladišnim kapacitetima su sljedeći:

assessed by the author, yielding about 550 t of table grapes. The most common cultivars of table grapes are Kardinal, Kraljica vinograda, Afus Ali, Demir Kapija, Italija and to a lesser extent Black magic, Viktoria, Moldova and others. According to data of the BiH Foreign Trade Chamber from 2007, the annual import of table grapes was 4,355 t, which is an evidence of the high disparity between production and consumption. Bosnia and Herzegovina has favorable conditions and potential areas for cultivation of table grape cultivars and increasing the production of table grapes should be one of the strategic commitments in the development of agriculture in order to balance production and consumption as much as possible.

There are three grapevine nurseries in the area of Herzegovina. Two are the privately owned nurseries in the area of Capljina, each with 2 ha and they produce standard planting material. The third modern nursery in the municipality of Ravno in the Popovo field has an area of 4 ha and produces certified planting material. These nurseries produce rootstocks that are most commonly used in Herzegovina: Kober 5BB, Paulsen 1103, Richter 109, Richter 110, Ruggeri



Slika 46. Blatina je obrana
Figure 46. Blatina is harvested

- industrijske vinarije imaju kapacitete 25.000.000 l,
- privatni registrirani podrumi imaju kapacitete od 4.000.000 l,
- privatni neregistrirani podrumi imaju kapacitete od 2.000.000 l.

Prema istim podacima na prostoru BiH postoji 46 registriranih vinarija.

Iz postojećih statističkih podataka dopunjenih posrednim izračunima i osobnim saznanjima autora proizlazi SWOT-analiza stanja vinogradarske proizvodnje u BiH.

Stanje vinogradarstva i vinarstva u Republici Srpskoj

Tatjana Jovanović-Cvetković

Proizvodnja grožđa i vina u Republici Srpskoj pokazuje značajnu tendenciju porasta u poslednje dvije decenije, kako u regionu Istočne Hercegovine tako i u sjevernom dijelu Republike Srpske. Podaci Republičkog zavoda za statistiku za period od 1999. do 2012. godine pokazuju da su površine pod vinogradima skoro tri puta povećane. Međutim, sektor vinogradarstva i vinarstva u Republici Srpskoj, opterećen je brojnim poteškoćama, počev od zakonskog okvira, proizvodnje sadnog materijala, ali i tehničke i tehnološke obučenosti proizvođača za proizvodnju grožđa i vina. Usvajanjem Zakona o vinu Republike Srpske, sa odogovarajućim pratećim pravilnicima, stvorila bi se dobra osnova za definisanje pravnih okvira za razvoj ove grane poljoprivredne proizvodnje.

Posmatrano kroz duži vremenski period, proizvodnja grožđa i vina u Republici Srpskoj se kao tradicionalna djelatnost može okarakterisati samo u regionu Istočne Hercegovine. Područje opštine Trebinje, sa Popovim, Petrovim i Mokrim poljem u istočnom dijelu Hercegovine, predstavlja vodeće vinogradarsko područje na prostoru Republike Srpske. Rejonizacija vinogradarstva Bosne i Hercegovine iz 1977. u vinogradarskom rejonu sjeverne Bosne definisala je postojanje tri vinogorja: Kozaračko, Ukrinsko i Majevičko. Međutim, razvoj vinogradarstva u

140, 161-69 Couderc and 41B. About 400,000 high-quality vine grafts are annually produced in the area of FB&H, according to assessments of the author.

There is an imbalance also in the production and consumption of wine. Annual production of wine in Bosnia and Herzegovina is 10,000,000 l, and the annual import is 10,277,297.82 l. According to a study conducted by a group of authors for the purpose of developing the agriculture strategy of the Federation of BiH, data on production and storage capacities are the following:

- industrial wineries have the capacity of 25,000,000 l
- privately owned registered cellars have the capacity of 4,000,000 l
- privately owned unregistered cellars have the capacity of 2,000,000 l.

According to the same data, there are 46 registered wineries in the territory of B&H.

SWOT analysis of the situation in the production of grapes follows from existing statistical data supplemented by indirect calculations and personal information of the author.

The state of viticulture and winemaking in the Republic of Srpska

Tatjana Jovanović-Cvetković

Production of grapes and wine in the Republic of Srpska shows a significant increase tendency in the last two decades, both in the region of Eastern Herzegovina and in the northern part of the Republic of Srpska. The data of the State Institute of Statistics for the period from 1999 to 2012 show that the areas planted with vines are almost three times larger. However, the sector of viticulture and winemaking in the Republic of Srpska is burdened with numerous problems, beginning with the legal framework, production of planting material, but also technical and technological training of producers for production of grapes and wine. Adoption of the Wine Act of the Republic of Srpska with the appropriate accompanying regulations would make a good basis for defining

ova tri vinogorja bio je daleko ispod prosjeka proizvodnje na teritoriji Hercegovine. Razlike između ova dva regiona ogledaju se u pedološkim, klimatskim i drugim specifičnostima, koje imaju velikog uticaja na proizvodnju grožđa i vina.

Na osnovu podataka o dominantnim tipovima zemljišta možemo zaključiti da između dva najvažnija vinogradarska područja u Republici Srpskoj, postoje veoma izražene razlike. Naime, u sjevernom i sjeverozapadnom dijelu Republike Srpske preovlađuju kiselo smeđe zemljište, crnica, crnica na krečnjaku, aluvijalno zemljište, livadsko zemljište, pseudoglej (dolinski, obronačni i terasni) i drugi tipovi zemljišta. Područje Istočne Hercegovine karakteriše prije svega prisustvo plitkih zemljišta, kao što su smeđe zemljište na krečnjaku, smeđe zemljište na laporu, smeđe zemljište na serpentinu, rendzine, crvenice i druga zemljišta.

Na teritoriji Republike Srpske mogu se izdvojiti tri tipa klime:

– *Umjereno kontinentalna klima* (Sjeverni peripanonski prostor)- sa umjereno hladnim zimama i toplim ljetima;

the legal framework for development of this branch of agricultural production.

Considered over a longer period of time, production of grapes and wine in the Republic of Srpska can be characterized as a traditional activity only in the region of Eastern Herzegovina. The municipality of Trebinje, with Popovo, Petrovo and Mokro fields in the eastern part of Herzegovina, is the leading wine-growing area in the territory of the Republic of Srpska. Zoning of viticulture in Bosnia and Herzegovina in 1977 defined three wine-growing regions in the viticultural zone of northern Bosnia: Kozara, Ukrina and Majevica. However, the development of viticulture in the three wine-growing regions was far below the average production in the territory of Herzegovina. The differences between these two zones are reflected in soil, climate, and other specifics that have a big influence on the production of grapes and wine.

Based on data on dominant soil types, we can conclude that there are very significant differences between the two most important wine-growing areas in the Republic of Srpska. Namely, acid brown soil, calcomelanosol, calcomelanosol on



Slika 47. Moderni vinograd u Trebinju
Figure 47. Modern vineyard in Trebinje

– *Planinska i planinsko - kotlinska klima* – sa kratkim i svježim ljetima i hladnim i snijegom bogatim zimama;

– *Izmjenjena varijanta mediteranske, jadranske klime* (Hercegovina) - sa veoma toplim ljetima, padavinama uglavnom u toku jeseni i zime i karakterističnim vjetrovima, bura i jugo.

Analizom prosječnih vrijednosti klimatskih parametara, konstatovane su značajne razlike, koje su uslovljene prije svega geografskim položajem i nadmorskom visinom lokacija na kojima su vršena mjerenja.

Analiza osnovnih klimatskih parametara, nedvosmisleno ukazuje na mnogo povoljnije klimatske uslove za uzgoj vinove loze na području Hercegovine. Poseban problem za uzgoj vinove loze u sjevernom dijelu Republike Srpske mogu predstavljati apsolutne minimalne temperature, čija vrijednost za područje Banja Luke iznosi -26,4 ˚C. Negativan uticaj niskih zimskih temperatura može se prevazići, pravilnim izborom sorti, kao i primjenom agrotehničkih i amplotehničkih postupaka u proizvodnji grožđa prilagođenih kontinentalnom uzgoju vinove loze.

limestone, alluvial soil, meadow soil, pseudogley (valley, slope and terrace type) and other types of soil are prevalent in the northern and northwestern part of the Republic of Srpska. The area of Eastern Herzegovina is characterized primarily by presence of shallow soils, such as brown soil on limestone, brown soil on marl, brown soil on serpentine, rendzina, terra rossa and other soils.

Three types of climate can be identified in the territory of the Republic of Srpska:

– *Temperate continental climate (Northern Peripannonic area) - with moderately cold winters and warm summers;*

– *Mountainous and mountainous-valley climate - with short and cool summers and cold and snowy winters;*

– *Modified variant of the Mediterranean, Adriatic climate (Herzegovina) - with very hot summers, rainfall mainly in fall and winter, and typical winds, bora and jugo.*

Analysis of average values of climatic parameters established significant differences, which are primarily due to geographic positions and altitudes of sites at which measurements were conducted.

Tabela 19. Klimatski pokazatelji kao faktori uspijevanja vinove loze (Banja Luka i Trebinje)
Table 19. Climatic indicators as factors of successful growth of grapevines (Banja Luka and Trebinje)

Klimatski pokazatelji **Climatic indicators**	Trebinje	Banja Luka	Razlika Difference
Srednja vegetaciona temperatura, (˚C) Average air temperature in vegetation, (˚C)	19,9	17,5	+2,4
Srednja godišnja temperatura, (˚C) Average annual air temperature, (˚C)	14,9	11,9	+3,0
Apsolutna minimalna temperatura, (˚C) Absolute minimal air temperature, (˚C)	-8,4	-26,4	- 18,0
Vegetaciona suma efektivnih temperatura, (˚C) The effective temperature sum in vegetation, (˚C)	2114,1	1602,2	+511,9
Insolacija tokom vegetacije, (h) Insolation in vegetation, (h)	1929,0	1493,7	+435,3
Vegetaciona količina padavina, (mm) The rain sum in vegetation, (mm)	683,4	628,6	+54,8
Potencijalno trajanje sunčeva sjaja u vegetaciji, (h) Potential duration of sunshine in vegetation (h)	2921,8	2909,6	+12,2

Površine i proizvodnja grožđa i vina Republici Srpskoj

Analiza statističkih podataka o proizvodnji grožđa i vina u Republici Srpskoj za period od 1999. do 2012. godine (Statistički godišnjak Republike Srpske, 2012), pokazuje da je u posmatranom periodu, došlo do povećanja ukupnih površina pod vinogradima, što je uticalo i na povećanje proizvodnje vina. Iako je teško precizno odrediti intenzitet razvoja vinogradarstva u sjevernom dijelu Republike Srpske i Istočnoj Hercegovini, podaci sa terena pokazuju da je trend podizanja novih vinograda prisutan u obje regije.

U skladu sa povećanjem ukupnih površina pod vinogradima u posmatranom periodu, došlo je do povećanja i ukupnog broja rodnih čokota, od skoro milion rodnih čokota. Ukupnu proizvodnju grožđa u analiziranom periodu takođe karakteriše tendencija porasta. Međutim, ukupna proizvodnja grožđa pokazuje značajno variranje po godinama u posmatranom periodu, što je posljedica ne samo pomenutih transformacija vinogradarstva u analiziranom periodu (krčenje, obnova starih i podizanje novih zasada), već i različitih vremenskih prilika, koje nedvosmisleno mnogo utiču na visinu prinosa.

Ukupna proizvodnja vina u posmatranom periodu sa manjim ili većim kolebanjima prati smanjenje ili povećanje broja rodnih čokota odnosno količinu proizvedenog grožđa (tabela 20.).

Analysis of basic climatic parameters clearly indicates much more favorable climatic conditions for cultivation of grapes in the area of Herzegovina. The absolute minimal air temperature, whose value is (-26.4 ˚C) for the area of Banja Luka, may pose a particular problem for grape cultivation in the northern part of the Republic of Srpska. The negative impact of low winter temperatures can be overcome by proper selection of varieties, as well as application of agro-technical and ampelo-technical procedures in the production of grapes adapted to continental cultivation of grapes.

Areas and production of grapes and wine in the Republic of Srpska

Analysis of statistical data on the production of grapes and wine in the Republic of Srpska for the period from 1999 to 2012 (Statistical Yearbook of the Republic of Srpska, 2012) shows that there was an increase in the total area of vineyards in the period, which resulted in increase in production of wine. Although it is difficult to precisely determine the intensity of the development of viticulture in the northern part of the Republic of Srpska and Eastern Herzegovina, field data indicate that the trend of establishing new vineyards is present in both regions.

In line with increase in the total area of vineyards in the observed period, there was also an increase in the total number of productive vines of nearly a

Tabela 20. Pokazatelji proizvodnje u Republici Srpskoj (1999. – 2012.).
Table 20. Production data in the Republic Serbska (1999 – 2012)

Godina Year	Površine Areas *(ha)*	Ukupan broj čokota Total number of vines (000*)*	Broj rodnih čokota Number of productive vines (000)	Ukupna proizvodnja grožđa (t) Total production of grapes	Ukupna proizvodnja vina Total production of wine (1000 l
1999.	130	563	558	853	224
2010.	527	1654	1501	3181	382
2011.	518	1741	1508	3033	605
2012.	514	1752	1587	2958	465



Slika 48. Vinograd u sjevernoj Bosni
Figure 48. Vineyard in northern Bosnia

Prisutne oscilacije u proizvodnji vina se između ostalog mogu dovesti u vezu sa nivoom proizvodnje grožđa, ali u nekim slučajevima i sa nedostatkom dovoljnih i adekvatnih prerađivačkih kapaciteta. Izgradnja savremenih prerađivačkih i skladišnih kapaciteta je sigurno jedan od ozbiljnih aktivnosti koje je neophodno realizovati u narednom periodu, kako bi se unapredila i pospješila vinogradarska proizvodnja u Republici Srpskoj.

Zakonska regulativa u oblasti vinogradarstva i vinarstva

Proizvodnja grožđa i vina u Republici Srpskoj je trenutno jednim dijelom regulisana zakonima na nivou Republike Srpske: Zakonom o sadnom materijalu - kojim se reguliše način proizvodnje i promet sadnog materijala vinove loze i Zakonom o vinu i rakiji - kojim se propisuju načini i uslovi proizvodnje vina, rakije i drugih proizvoda od grožđa i vina, kao i njihovo stavljanje u promet. Ipak, postojeću zakonsku regulativu neophodno je upotpuniti određenim podzakonskim aktima, odnosno Pravilnicima, čime bi se detaljnije uredila navedena oblast, kao i usaglasiti sa zakonskim okvirom na državnom nivou.

million productive vines. The total production of grapes in the analyzed period is also characterized by a tendency of growth. However, the total production of grapes shows a significant variation by year in this period, which is a consequence not only of the said transformations of viticulture in the analyzed period (clearing, renewal of old vineyards and establishing of new ones), but also of different weather conditions that undoubtedly affect yields.

With lower or higher fluctuations, the total production of wine in the observed period follows decreases or increases in numbers of productive vines or amounts of grapes produced (Table 20).

Fluctuations present in the production of wine can be related inter alia to levels of the production of grapes, but in some cases also to the lack of sufficient and adequate processing capacities. Construction of modern processing and storage capacities is certainly one of the serious activities that need to be implemented in the next period, in order to improve and upgrade the viticultural production in the Republic of Srpska.

Vinogradarski katastar

Marijo Leko

Svake se godine u neproizvodne svrhe koriste velike površine poljoprivrednoga zemljišta čime se ono nepovratno gubi. Vrši se prenamjena poljoprivrednoga zemljišta u građevinsko, sukladno potrebama gospodarskoga razvoja. Tim se procesom nepovratno gube vinogradarski položaji na kojima se mogu i trebaju proizvoditi vrhunske, autohtone sorte Bosne i Hercegovine. O svim tim promjenama s aspekta ukupnih površina, ukupna broja vinogradarskih parcela, vlasničke strukture i sl. nužno je voditi evidenciju kako bi se mogla kreirati politika koja regulira to područje. Katastar, kao skup grafičkih i pisanih dokumenata u kojima je iskazan određeni broj informacija o svakoj zemljišnoj čestici i objektima na njoj, najbolji je vid vođenja evidencije.

Povijesni pregled

U poglavlju o povijesti razvoja vinogradarstva na ovim prostorima detaljno su obrađeni povijesni

Legal regulations in the fields of viticulture and winemaking

Production of grapes and wine in the Republic of Srpska is currently partly regulated by the laws at the Republic of Srpska level: the Law on Planting Material - regulating the method of production and trades of planting materials, and the Law on Wine and Brandy - that lays down the methods and conditions of production of wine, grape brandy and other grape and wine products, as well as their marketing. Still, it is necessary to bring the existing legislation up to date by certain bylaws or rules that would regulate the stated field in more detail, and harmonize it with the legal framework at the state level.

Vineyard cadastre

Marijo Leko

Large areas of agricultural land are used for non-production purposes every year, which makes them irreversibly lost. Conversion of agricultural land into construction land is



Slika 49. Mladi vinograd na kršu
Figure 49. Young vineyard on krast

izvori koji se odnose na kulturu uzgoja vinove loze. Sve do vremena Austro-Ugarske Monarhije nije bilo preciznijih podataka koji bi nedvosmisleno ukazivali na stvarno činjenično stanje s aspekta površina, sortimenta, prinosa, razmaka sadnje i drugih podataka temeljem kojih bi se mogli donositi zaključci o toj gospodarskoj grani. U tom je smislu prvi pomak učinjen ustrojem zemljišnoga katastra kojeg su austrougarske vlasti, na našim prostorima, provele krajem 19. stoljeća.

Austro-Ugarska je nakon okupacije Bosne i Hercegovine odmah pristupila osnivanju katastra zemljišta. Taj katastar zemljišta izrađen je u rekordno kratkom vremenu od 1880. do 1884. godine. Koncipiran je tako da istodobno zadovolji vojne i upravne potrebe Monarhije. U tom razdoblju popisano je nešto više od pet milijuna parcela i za svaku parcelu upisana je površina i kultura koja je zatečena na parceli. Nakon završetka katastarske izmjere i uspostavljanja gruntovnica utvrđeno je da u cijeloj Bosni i Hercegovini ima 4.500 ha vinograda. Bio je to prvi precizan podatak o površinama pod vinogradima u Bosni i Hercegovini. Nakon toga je statistika o vinogradarskim površinama vođena više anketiranjem, a manje preciznim uvidom u stanje na terenu, što je ponekad moglo dovesti do razlika između stvarnoga i prikazana stanja.

Sve do Prvoga svjetskog rata proizvodnja je bila u stalnom usponu tako da je 1912. u Hercegovini bilo 6.040 hektara vinove loze s proizvodnjom grožđa od 12.000 tona. U razdoblju je između dva svjetska rata vinogradarstvo imalo velikih problema s filokserom, štetnikom koji je uništio veliki broj vinograda. Spora obnova vinograda kalemljenim sadnicama i pošast Drugoga svjetskog rata doveli su do toga da je na završetku rata u Hercegovini bilo 3.021 ha, dvostruko manje nego pred Prvi svjetski rat.

Nakon Drugoga svjetskog rata uslijedila je obnova nasada na krilima tzv. društvenog sektora. Iz toga razdoblja postoji precizna evidencija o sortimentu, prinosima, starosti nasada i drugim podacima koji se odnose na državno vlasništvo. Međutim podaci o vinogradima koji su u privatnom vlasništvu s aspekta ukupnih površina, broja parcela, sortimenta, prinosa, starosti ne postoje ili su neprecizni.

conducted in keeping with needs of economic development. Wine-growing locations, where top quality autochthonous varieties of Bosnia and Herzegovina can be produced and should be produced, are irreversibly lost by that process. To be able to create a policy that regulates this field, it is necessary to keep records of all these changes in terms of total areas, total number of vineyard plots, structure of ownership, etc. Cadastre, as a set of graphic and written documents that present a certain amount of information about each land plot and structures in it, is the best form of record keeping.

Historical overview

The chapter on history of viticulture in this region treated historical sources relevant to the culture of growing vines in detail. Until the time of the Austro-Hungarian Empire, there were no precise data that would clearly indicate the actual facts in terms of area, cultivars, yield, planting distance and other information based on which it would be possible to make conclusions on this economic sector. In this respect, the first progress was made by the organization of land cadastre which was implemented in our region by the Austrio-Hungarian authorities in the late 19th century.

Following the occupation of Bosnia and Herzegovina, Austria immediately started setting up the land cadastre. The land register was developed in a very short period from 1880 to 1884. It was designed to simultaneously satisfy the military and administrative needs of the Empire. During this period, slightly more than five million plots were registered, and for each plot, its area and crop that was found in the plot were registered. Upon completion of the cadastral survey and establishment of land registers, it was found that there were 4,500 hectares of vineyards in the entire Bosnia and Herzegovina. That was the first precise information on areas of vineyards in Bosnia and Herzegovina. After that, statistics on wine-growing areas were managed more by interviewing and less by precisely examining the situation in the field, which could sometimes lead to differences between the real and reported situations.

Until the First World War, production was steadily

U nastojanju da na suvremen način uredi evidencija nekretnina, Bosna i Hercegovina od 1953. godine radi na premjeru teritorija i na osnovi istoga uspostavlja katastar zemljišta. Međutim suvremeni katastar zemljišta ne znači da je urađena suvremena evidencija nekretnina. Stoga se već od 1968. godine razmišlja kako urediti i izgraditi evidenciju primjerenu vremenu i tehničkim mogućnostima.

Slijedeći inicijative koje je donijela Ekonomska komisija Ujedinjenih Naroda 1970. i 1973. godine, a odnose se na načela i mogućnosti uspostavljanja suvremenoga katastra nekretnina, pristupa se aktivno toj problematici. I upravo se na tim načelima definiraju uvjeti kojima treba odgovoriti novi katastar nekretnina. Temeljem navedenoga pristupilo se izradi vinogradarskoga katastra Federacije Bosne i Hercegovine, definiranju koncepta, alata i načina njegove realizacije.

Cilj i elementi za katastar

Cilj je izraditi Vinogradarski katastar kao numeričku i kartografsku bazu podataka koristeći suvremene alate kao što su softveri za prostorni prikaz parcela za koje je moguće upisati niz tabličnih podataka uz pomoć digitaliziranih ortofoto snimaka terena, topografskih karata,

rising so in 1912 there were 6,040 hectares of vines in Herzegovina with a production of 12,000 tons of grapes. In the period between the two world wars, viticulture was having big problems with phylloxera, the pest that destroyed a large number of vineyards. Slow renewal of vineyards by grafted seedlings and the calamity the Second World War led to the fact that at the end of the Second World War there were 3,021 hectares in Herzegovina, half as much as before the First World War.

The Second World War was followed by renewal of plantations on the wings of the so-called „social sector“. From this period there are precise records on varieties, yields, ages of plantations and other data related to the state ownership. However, data on vineyards that are privately owned in terms of total areas, numbers of plots, cultivars, yields, ages do not exist or are inaccurate.

In an effort to regulate property records in a modern way, Bosnia and Herzegovina worked on land survey from 1953 and on the basis of it established the land cadastre. However, modern land cadastre did not mean that up-to-date property records were made. Therefore already from 1968 it had been considered how to organize and develop records suited to the time and technical capabilities.



Slika 50. Usitnjenost vinogradarskih parcela
Figure 50. Fragmentation of vineyard plots

katastarskih planova i sl.

U numeričkom dijelu baze podataka vinogradarskoga katastra evidentiraju se podaci:

- o vlasništvu,
- o identifikaciji katastarske čestice,
- o strukturi sortimenta,
- o starosti nasada,
- o popunjenosti nasada,
- o prinosima,
- o ostalim podacima.

U grafičkom dijelu baze podataka vinogradarskoga katastra bit će podaci:

- o prostornom prikazu vinogradarskih parcela i
- o potencijalnim površinama poljoprivrednoga zemljišta za razvoj vinogradarstva.

Temelji za izradu katastra

Zakonski temelj za izradu Vinogradarskoga katastra sadržan je u Zakonu o vinu BiH koji u članku 5. (stavak 6) definira vođenje katastra postojećih i mogućih vinogradarskih površina s idealnim vinogradarskim zemljištem**.** Budući da vinogradarstvo i vinarstvo zauzima važno mjesto u zajedničkoj agrarnoj politici EU-a, takav je registar prije svega potreban kako bi se dobile informacije o potencijalima proizvodnje i trendovima, te kako bi se osiguralo pravilno funkcioniranje zajedničkoga tržišta. Izrada Vinogradarskoga katastra preduvjet je za ulazak BiH u EU.

U izradi Vinogradarskoga katastra koristi se:

1) Registar proizvođača grožđa i vina,
2) digitalizirane topografske karte mjerila 1: 25.000,
3) digitalizirani ortofoto snimci,
4) digitalizirani katastarski plan.

BiH još ne raspolaže Registrom (Upisnikom) proizvođača grožđa i vina. Zakon o vinu BiH predvidio je uspostavu Registra. Člankom 14. i 15. definirane su obveze upisa kao i podaci koji se tom prigodom upisuju. U Registar se upisuju pravne i fizičke osobe koje proizvode i prerađuju grožđe i vino. Većina podataka koji se upisuju u

Following the initiatives taken by the United Nations Economic Commission in 1970 and 1973, and considering principles and possibilities of establishing a modern real property cadastre, they took an active approach to this issue. And it is precisely on these principles that the requirements, which needed to be satisfied by the new real property cadastre, were defined. Development of vineyard cadastre of the Federation of Bosnia and Herzegovina, articulation of concepts, tools and implementation methods were undertaken on these bases.

Objective and elements for the cadastre

The objective is to create a vineyard cadastre as a numerical and cartographic database using modern tools such as software for spatial representation of plots for which it is possible to enter a series of tabular data with the help of digital orthophoto images of the terrain, topographic maps, cadastral plans, etc.

The numerical part of the vineyard cadastre database keeps data on:

- ownership
- identification of the cadastral parcel
- structure of cultivars
- age of plantation
- plantation density
- yields
- other data

The graphical part of the vineyard cadastre database will contain data on:

- spatial view of vineyard plots
- potential agricultural land areas for development of viticulture

Bases for cadastre development

The legal basis for development of the vineyard cadastre is contained in the B&H Wine Code, which defines keeping of a cadastre of existing and potential viticultural areas with ideal wine-growing land **in Article 5 (subsection 6).** Since viticulture and oenology occupy an important place in the common agricultural policy of the EU, this register is primarily needed in order to obtain information on production potentials and trends, and to ensure proper functioning of the

Registar sadržaj su i Vinogradarskoga katastra.

Topografske karte su kartografski prikazi proizišli iz točne i cjelovite izmjere topografskih objekata. Geodetska uprava raspolaže digitaliziranim topografskim kartama u obliku koji je uporabljiv za korištenje u GIS-u. Te se karte kao podloga mogu eventualno koristiti za vektorizaciju (obilježavanje) većih vinogradarskih površina (iznad 1 ha). Za vinograde manje od 1 ha, kakvih je na našem području najviše, moraju se koristiti druge podloge kao što su ortofoto snimci i vektorizirani katastarski planovi. Topografske karte preko izohipsa mogu poslužiti za određivanje nagiba terena kao i nadmorske visine. Zahvaljujući tome mogu poslužiti za iscrtavanje digitalnoga modela reljefa iz kojega crpimo podatke o ekspoziciji, o nagibu, o opasnosti od erozije i sl.

Digitalni ortofoto je avionski snimak tla, u digitalnom (rasterskom) obliku koji je posebnim postupcima *ortorektificiran*. Ortorektifikacija je postupak obrade fotografije koji uključuje uklanjanje geometrijskih netočnosti zbog perspektive, utjecaja reljefa, leće fotoaparata i sl., kao i uklanjanje razlika u svjetlini i svojstvima boja pojedinih fotograma (pojedinačnih

common market. Preparation of the vineyard cadastre is a prerequisite for joining the EU.

The following are used in preparation of the Vineyard Cadastre:

1) Register of grape and wine producers;
2) Digitized topographic maps in the scale 1: 25,000;
3) Digitized orthophoto images;
4) Digital cadastral plan;

B&H does not have a register of grape and wine producers yet. The BiH Wine Code anticipates setting up of the register. Articles 14 and 15 define the obligations of registration as well as data that is entered on that occasion. Legal and natural persons who produce and process grapes and wine are recorded in the register. Most of the data that are entered in the register are also contained in the Vineyard Cadastre.

Topographic maps are cartographic representations derived from accurate and complete survey of topographic features. The Geodetic Administration has digitized topographic maps in a format that is suitable for use in GIS. These maps may be used as a basis



Slika 51. Ortofoto snimak i vektorizirane vinogradarske parcele
Figure 51. Orthophoto image and vectorized vineyard parcels

avionskih snimaka). Ortofoto snimci, u odnosu na topografske karte, predstavljaju višu razinu preciznosti (slika 51.) s aspekta prepoznatljivosti parcela. Zahvaljujući sitnijem mjerilu na ortofoto snimkama moguće je vizualno prepoznati parcele na kojima je zasađen vinograd. Odgovarajućim se alatom parcele vektoriziraju (slika 51.), nakon čega se automatski prikaže površina vektorizirane parcele. Međutim još uvijek ne znamo ništa o sadržaju vinograda (vlasništvo, sorta, starost, popunjenost nasada i dr.). Provjerom na terenu (GPS) i u komparaciji s katastarskim podacima, za svaki prikazani vinograd (poligon) popunjava se numerička baza s potrebnim podacima.

Proces digitalizacije katastarskih planova i njihove vektorizacije je u tijeku. Geodetska uprava raspolaže djelomično s tim planovima. Preklapanje digitaliziranih i vektoriziranih katastarskih planova s drugim grafičkim izvornicima (topografske karte i ortofoto snimci) predstavlja završni korak elektroničke obrade podataka. Katastarski planovi podloga su za kartografsku i numeričku bazu podataka (vlasništvo, katastarska kultura, površina, prostorni smještaj i sl.). Usporedbom katastarskih podataka s analitičkim podacima obrade ortofoto snimaka situacija po pitanju stvarnoga broja vinograda bit će jasnija i preciznija. Naime, još uvijek se u katastru određene površine vode kao katastarska kultura vinograda iako na terenu one to nisu i obratno.

U bazi podataka postoje digitalizirani pedološki podaci u formi koja se može koristiti u GIS-u. Za svaki identificirani vinograd, potencijalni apsolutni vinogradarski položaj, kao i potencijalno šumsko zemljište za prenamjenu u vinogradarsko zemljište moguće je prikazati osnovne pedološke parametre.

Izrada katastra

Metode koje koristimo u radu možemo podijeliti na računalne i terenske. Prije terenskoga rada, uz pomoć računalnoga programa ArcGis 9, izvrše se pripremne radnje: kreiranje baze podataka i vektorizacija georeferenciranih ortofoto snimaka koji će poslužiti za terenski rad-očevid na terenu. Svaka obilježena vinogradarska parcela dobiva svoj jedinstven računalni broj pomoću kojega se

for vectorization (marking) of larger vineyard areas (over 1 ha). Other data such as orthophoto images and vectorized cadastral maps should be used for vineyards of less than 1 ha, which are the most common in our area. Through contours, topographic maps can be used to determine terrain inclinations as well as altitudes. As a result, they can be used to draw digital models of the relief from which we can draw data on exposure, slope, erosion risks, etc.

Digital orthophoto is an aerial image of the terrain, in a digital (grid) format that is "orthorectified" using particular methods. Orthorectification is a procedure for processing photographs that involves removal of geometric inaccuracies caused by perspective, influence of relief, camera lens, etc., as well as elimination of differences in brightness and color properties of individual photograms (individual aerial images). In relation to topographic maps, orthophoto images represent a higher level of accuracy (figure 51.) in terms of recognizability of parcels. Thanks to a finer scale of orthophoto images, it is possible to visually identify plots with planted vineyards. Plots are vectorized using the appropriate tool (figure 51.), after which the area of the vectorized plot is automatically displayed. However, we still do not know anything about details of vineyards (ownership, cultivar, age, plantation density, etc.). The numerical base is filled with the necessary data for each displayed vineyard (polygon) by verification in the field (GPS) and in comparison with cadastral data.

The process of digitization of cadastral plans and their vectorization is in progress. The Geodetic Administration has a part of these plans at their disposal. Matching of the digitized and vectorized cadastral plans with other graphical sources (topographic maps and orthophoto images) is the final step of the electronic data processing. Cadastral plans are the basis for cartographic and numerical database (ownership, cadastral crops, area, spatial position, etc.). By comparing the cadastral data with analytical data of orthophoto image processing, the situation will be more clear and accurate in terms of actual number of vineyards. Namely, in the cadastre some areas are still kept as cadastral vineyard crops, although in the field they are not so, and vice versa.

identificira na terenu.

Očevid na terenu je najzahtjevniji posao izrade vinogradarskoga katastra jer zahtijeva osobni kontakt sa svakim vlasnikom vinograda. Preduvjet za to predstavlja popunjavanje Registra na temelju kojeg će biti moguće uspostaviti kontakt i izvršiti očevid na licu mjesta (u vinogradu). Ideja je da se u taj dio posla uključe djelatnici općine i županije, zaduženi za poslove poljoprivrede, kao i određeni broj studenata koji bi, po unaprijed određenom rasporedu, obilazili vinograde i prikupljali podatke.

Velike poteškoće pritom stvara usitnjenost vinogradarskih parcela. Primjerice u općini Čitluk na 770 ha vinograda ima ukupno 3.400 parcela, a samo vinogradi vinarije Čitluk (bivše društveno vlasništvo) imaju površine veče od 2 ha. Sve ostale parcele imaju manje od 1 ha. Na slici 52. jasno se vide gusto zbijene sitne privatne parcele za razliku od nekoliko velikih plantažnih vinograda.

U bazu podataka vinogradarskoga katastra upisuje se 28 tabličnih atributa:

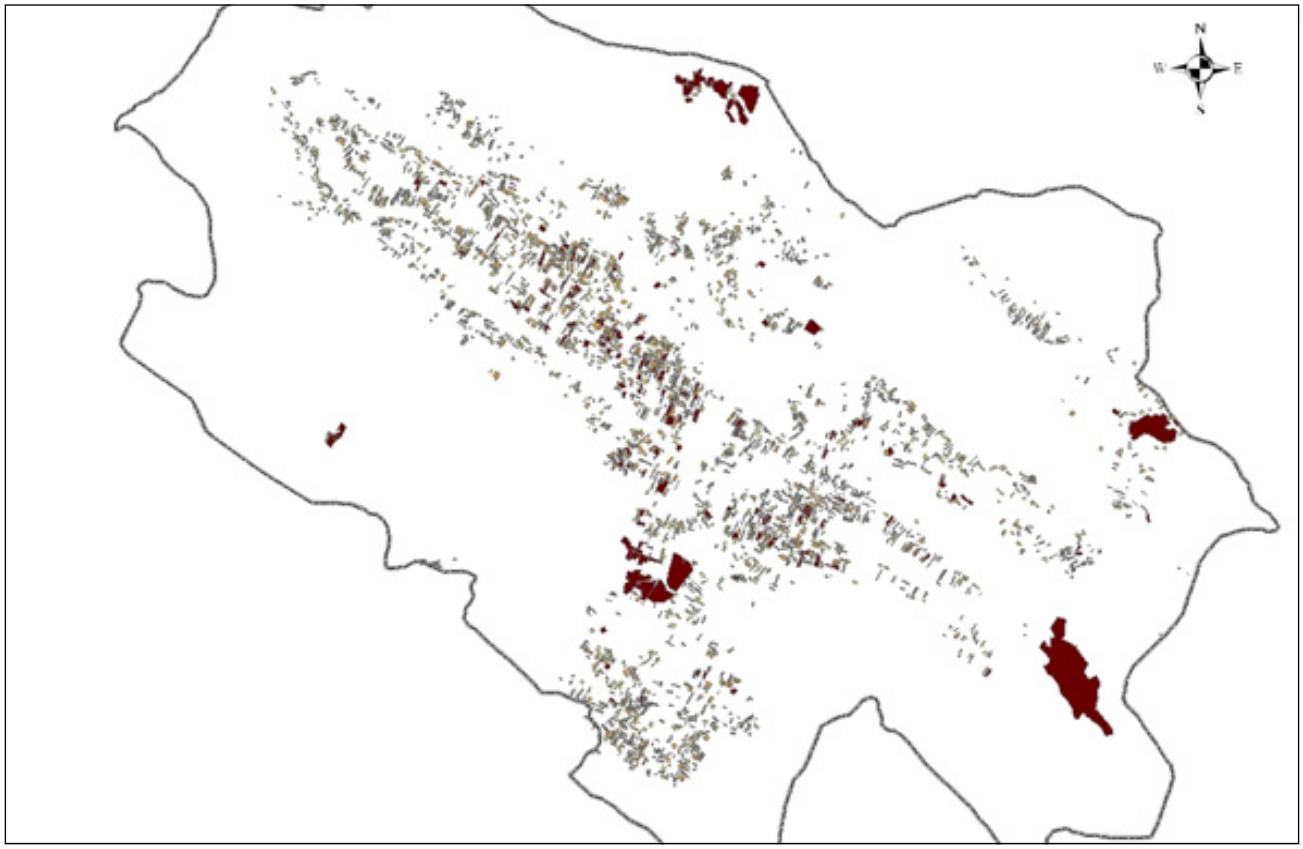
1. Ime i prezime

The database contains digitized pedological data in a form that can be used in GIS. For each identified vineyard, potential absolute wine-growing position, as well as potential forest land for conversion into viticultural land, it is possible to display basic pedological parameters.

Cadastre development

The methods used in the work can be divided into computer and field methods. Before the field work, preparatory actions are conducted using the computer program ArcGIS 9: creation of a database and vectorization of georeferenced orthophoto images that will be used for field work - field investigation. Each marked vineyard parcel is assigned its unique computer number by which it can be identified in the field.

The field investigation is the most demanding task in production of vineyard cadastre because it requires personal contact with each owner of vineyard. A prerequisite for this is to fill the register, based on which it will be possible to establish contacts and make field visits (in vineyards). The idea is to involve in this part of



Slika 52. Vinogradarske parcele općine Čitluk prema ortofoto snimcima
Figure 52. Viticultural plots in the municipality of Citluk according to orthophoto images

2. BPG
3. JMBG
4. ID broj
5. Vlasništvo
6. Općina
7. Katastarska općina
8. Vinogorje
9. Lokalitet
10. Položaj
11. Tabla
12. Broj katastarske čestice
13. Nadmorska visina
14. Površina u m²
15. Ekspozicija
16. Nagib
17. Tip tla
18. Navodnjavanje
19. Razmak redova u m
20. Razmak trsova u redu u m
21. Godina sadnje
22. Starost u godinama
23. Sklop u %
24. Uzgojni oblik
25. Visina stabla
26. Kultivar

the work the municipality and county employees responsible for agricultural affairs, as well as a certain number of students who would be visiting vineyards and collecting data according to a predetermined schedule.

Fragmentation of vineyard plots slows down this work. For example, in the municipality of Citluk on 770 hectares of vineyards there is a total of 3,400 plots, and only the vineyards of the Citluk winery (former socially owned) have a surface areas greater than 2 hectares. All other parcels have less than 1 ha. Densely packed small private plots as opposed to a few large plantations of vineyards can be seen in figure 52.

Twenty eight tabular attributes are recorded in the vineyard cadastre database:

1. Full name
2. AH No
3. SIN
4. ID number
5. Ownership
6. Municipality
7. Cadastral municipality
8. Wine-growing region



Slika 53. Vinograd prosječne veličine
Figure 53. An average vineyard

27. Broj trsova
28. Urod po trsu

Nakon popunjavanja baze podataka izvršit će se analiza podataka prema svakom pojedinačnom podatku prema mogućnostima softvera. Na odgovarajućoj karti prikazuje se poveznica prostornih i tabličnih podataka. U tablici se za svaku pojedinačno označenu parcelu na digitalnom, georeferenciranom listu ortofoto snimka, upisuju pripadajući podaci koji se prikupljaju očevidom na terenu.

Dosadašnji rezultati

U tablici 21. prikazani su preliminarni rezultati dosadašnjega istraživanja koji se odnose na površine pod vinogradima i prosječnu veličinu parcele.

Zaključak

S obzirom na izvornike podataka Vinogradarski katastar sastojat će se:

- od numeričke i
- od kartografske baze podataka.

Numerička baza temeljit će se na podacima iz Registra proizvođača grožđa i vina, i sadržavat

9. Site
10. Position
11. Table
12. Cadastral parcel number
13. Altitude
14. Area in m²
15. Exposition
16. Slope
17. Soil type
18. Irrigation
19. Row spacing in m
20. Vine spacing in a row in m
21. Planting year
22. Age in years
23. Layout in %
24. Growing form
25. Tree height
26. Cultivar
27. Number of vines
28. Yield per vine

After filling the database, data will be analyzed against each individual piece of information depending on software options. An appropriate map shows the link between spatial and tabular data. For each individually marked parcel on the digital georeferenced sheet of orthophoto image, corresponding data, collected by field investigation, are entered in the table.

Tablica 21. Stanje vinogradarstva u Hercegovini prema ortofoto snimcima
Table 21. The status of viticulture in Herzegovina according to orthophoto images

Općina Municipality	Površina općine Municipality area ha	Vinogradi Vineyards ha	Vinograda Vineyards %	Prosječna površina parcele Average parcel area ha	Ukupan broj parcela Total number of parcels
Mostar	115.764	1073,57	0,52	0,50	2147
Trebinje*	85.963	300	0,35	0,18	1667
Posušje	44.759	3,53	0.04	0,05	66
Široki Brijeg	37.958	101	0,27	0,09	1177
Ravno	32.673	42,27	0.35	0,48	222
Ljubuški	29.798	372	1,25	0,18	2123
Stolac	29.176	328,55	0,51	0,18	1307
Čapljina	25.164	350	1,39	0,50	700
Neum	24.343	30	0,12	0,09	333
Grude	21.937	85,9	0,39	0,08	1063
Čitluk	17.863	770	4,31	0,23	3403
Ukupno/Total	**495.590**	**3.521,55**	**0,77**	**0,23**	**14.208**

*Podatak u tablici je prema procjeni/ Data in table according to evaluation.

će podatke iz članka 15. Zakona o vinu. Upisnik će voditi uredi federalne uprave u županijama, odnosno, nadležna upravna tijela u općinama, a ujedinjavanje Upisnika će voditi ovlaštena institucija za poslove vinogradarstva i vinarstva.

Kartografska baza podataka temeljit će se na topografskim kartama, ortofoto snimkama, digitaliziranim katastarskim planovima, kao i digitalnom modelu reljefa. Baza podataka koja se treba uspostaviti organizirat će se na način da može prihvatiti i druge izvornike (podloge) ukoliko budu potrebni (npr. podaci o klimi, vegetaciji i sl.), a osnovni je cilj da bude točna, obnovljiva i primjenjiva.

SWOT-analiza

Viktor Lasić

Određivanje čimbenika koji imaju pozitivan ili negativan učinak na odabir strategije upravljanja provodi se pomoću SWOT-analize. U vinogradarstvu i vinarstvu SWOT-analiza je analitička metoda koja se koristi u identifikaciji vanjskih i unutarnjih čimbenika koji mogu djelovati na proizvodnju grožđa i vina i važni su za kreiranje odgovarajuće strategije proizvodnje.

Previous results

Table 21. presents preliminary results of previous investigations related to areas of vineyards and the average size of parcels.

Conclusion

In terms of data sources, the Vineyard Cadastre will consists of the:

- numerical, and
- cartographic database.

The numerical database will be based on data from the Register of grape and wine producers, and will contain the data from Article 15 of the Wine Act. Offices of the federal government in counties and competent authorities in municipalities will keep the register, and integration of the registers will be conducted by the authorized institution for viticulture and oenology affairs.

The cartographic database will be based on topographic maps, orthophoto images, digitized cadastral plans, and digital model of the relief. The database that is to be established will be organized in a way that it can also receive other sources (maps) if necessary (e.g. data on climate, vegetation, etc.), and it is primarily aimed to be accurate, renewable and applicable.



Slika 54. Iz ptičije perspektive
Figure 54. From a bird's eye view

Snage:

- ekološki uvjeti,
- tradicija uzgoja vinove loze i proizvodnja vina,
- prostor za širenje vinogradarske proizvodnje,
- struktura vinogradarske proizvodnje,
- autohtone sorte vinove loze.

Na području BiH postoje povoljni ekološki uvjeti za uzgoj vinove loze u svih šest vinogorja. U Mostarskom i Širokobriješkom vinogorju postoji višestoljetna tradicija uzgoja vinove loze i djelatnici s radnim iskustvom u vinogradarskoj i vinarskoj proizvodnji. Preostala četiri vinogorja odavno nemaju tradiciju ni važniju aktivnu vinogradarsku proizvodnju, ali se uz postojeće povoljne ekološke uvjete i stručan rad, ti prostori mogu aktivirati i predstavljati važan prostor za širenje vinogradarske proizvodnje. U postojećoj vinogradarskoj proizvodnji uglavnom se proizvodi vinsko grožđe, stolno grožđe u vrlo malim

SWOT analysis

Viktor Lasić

SWOT analysis is used to determine factors that have positive or negative effects on selection of management strategy. In viticulture and winemaking, SWOT analysis is the analytical method used to identify external and internal factors that may influence production of grapes and wine and are important for creating an appropriate production strategy.

Strenghts:

- Environmental conditions
- Tradition in growing vines and producing wine
- Area for expansion of the viticultural production
- Structure of viticultural production
- Autochthonous grape varieties

There are favorable environmental conditions



Slika 55. Nakon tuče
Figure 55. After hail

količinama, a proizvodnja grožđa za sušenje gotovo ne postoji. Podaci govore kako se sve navedene vinogradarske proizvodnje mogu širiti jer postoji tržišni prostor u unutarnjem prometu, ali i mogućnost izvoza u zemlje koje nemaju ekološke uvjete za vinogradarsku proizvodnju. Značajnija vinogradarska proizvodnja i postojanje autohtonih sorata vinove loze i postojanje proizvoda koji su posebnost samo ovih krajeva daju mogućnost etabliranja ovoga prostora kao vinogradarske i vinarske zemlje.

Slabosti:

- zakonska i institucionalna izgrađenost,
- tlo,
- proizvodnja sadnog materijala,
- sredstva za podizanje višegodišnjih nasada,
- potpore (poticaji) za primarnu poljoprivrednu proizvodnju,
- statistički podaci.

Sa stajališta vinogradarske proizvodnje BiH je nedovoljno zakonski i institucionalno izgrađena. Slabosti se očituju ne samo u postojanju ili nepostojanju kvalitetnih zakona, nego i u njihovoj provedbi, odnosno donošenju podzakonskih akata bitnih za njegovu provedbu (Zakon o vinu). Rajonizacija vinogradarstva, kao temeljni dokument svake vinogradarske zemlje, je zastarjela i prevladana u svakom svom segmentu i postaje ograničenje razvoja vinogradarske proizvodnje. Usitnjenost površina za vinogradarsku proizvodnju (naročito u aktivnim vinogorjima) je slabost, ali se može riješiti mjerama poljoprivredne politike. Proizvodnja zdravstveno ispravna sadnog materijala je nedostatna za značajnije širenje vinogradarske proizvodnje. Zakonska obveza (po važećem zakonu) kod proizvodnje *virus free* sadnoga materijala je testiranje na jedan virus, dok sve ostale vinogradarske zemlje imaju obavezu testirati sadni materijal na četiri virusa koji mogu nanijeti značajne štete. Kreditna sredstva za podizanje višegodišnjih nasada su sa visokim kamatama i malim razdobljem odgode, pa nisu stimulirajuća za razvoj vinogradarstva. Na poticaje u poljoprivredi trošimo velika sredstva (za naše prilike) koja ne daju adekvatne rezultate, niti te rezultate itko službeno valorizira. Način prikupljanja statističkih podataka za vinogradarsku proizvodnju je neadekvatan, a

for cultivation of grapes in all six wine-growing regions in the area of B&H. In Mostar and Siroki Brijeg wine-growing regions, there is a centuries-old tradition of growing grapes and workers with professional experience in the wine-growing and winemaking production. The other four wine-growing regions have not had tradition or significant active wine-growing production since long ago but with the existing favorable environmental conditions and professional work, those areas can be activated and represent a significant area for expansion of grape production. The existing viticultural production mainly produces wine grapes, table grapes in very small quantities, and production of grapes for drying is almost non-existent. Data show that all these types of wine-growing production have a potential to expand because there is a market space in internal trade, but also a possibility of export to countries that do not have environmental conditions for viticultural production. Significant wine production and presence of autochthonous grape varieties and the existence of products that are a special feature of this region only provide an opportunity to establish this area as a viticultural and winemaking country.

Weaknesses:

- Legal and institutional development level
- Soil
- Production of planting material
- Means for establishing multiannual plantations
- Subsidies (stimulations) for primary agricultural production
- Statistical data

In terms of viticultural production, B&H is inadequately legally and institutionally developed. Weaknesses are manifested not only in presence or absence of high-quality laws, but also in their enforcement, or adoption of bylaws essential for their implementation (the Wine Act). Zoning of wine-growing, as a fundamental document of every wine-growing country, is outdated and overcome in each of its segments, and is becoming a limitation to development of wine-growing production. Fragmentation of areas for viticultural production (especially in active wine-growing regions) is a weakness, but can be solved by measures of the agricultural policy.

količina tih podataka nedostatna je za donošenje kvalitetnih odluka.

Prilike (šanse):

- neobrađeno poljoprivredno tlo,
- struktura vinogradarske proizvodnje,
- novi proizvodi od grožđa i vina,
- promoviranje kulture konzumiranja vina i proizvoda od grožđa,
- blizina eu tržišta.

Omogućavanje korištenja neobrađena poljoprivrednog tla, davanjem u zakup ili koncesiju, predstavlja priliku za širenje vinogradarske proizvodnje. Zakonom definirano i administrativno olakšano pretvaranje šumskoga tla ili krša u poljoprivredno tlo također je prilika za širenje vinogradarske proizvodnje, jer je takvo tlo za druge poljoprivredne kulture gotovo neupotrebljivo. Na takvim površinama već imamo vinograde u Blizancima i Crnopodu koji daju urod visoke kakvoće. Povećanje proizvodnje stolnoga grožđa i proizvodnja besjemena grožđa predstavlja priliku za širenje vinogradarske proizvodnje, jer za te proizvode postoji prostor na domaćem tržištu, ali i u izvozu zbog blizine europskoga tržišta. Proizvodnja sokova, slatkog od grožđa i likera od vina također predstavljaju priliku za širenje vinogradarske proizvodnje. Promoviranje kulture konzumiranja vina i tretiranje vina kao prehrambenoga proizvoda (kao što je u većini vinogradarskih zemalja) dovest će do veće potražnje i niže cijene vina.

Prijetnje (ograničenja):

- tlo,
- zakonski okvir i institucionalna izgrađenost,
- proizvodnja sadnog materijala,
- organiziranost vinogradara i vinara,
- neuvezanost znanosti i proizvodnje,
- globalne klimatske promjene.

Usitnjenost poljoprivrednih površina je ograničenje za povećanje vinogradarske proizvodnje jer je svaka poljoprivredna proizvodnja skuplja na malim površinama. Negativnost malih poljoprivrednih površina u vinogradarskoj i vinarskoj proizvodnji još je izraženija, nego u drugim poljoprivrednim proizvodnjama, zbog važnosti lokaliteta za vinarsku proizvodnju.

Production of planting material compliant with health requirements is insufficient for a significant expansion of wine-growing production. Legal obligation (under the applicable law) in production of virus free planting material is testing for presence of one virus, while all other wine-growing countries have an obligation to test planting material for presence of four viruses that can cause significant damage. Credit funds for establishing multi-annual plantations are with high interest rates and low grace period, and so they are not stimulative for development of viticulture. We spend significant resources (for our circumstances) for incentives in agriculture that do not give adequate results, and nobody officially valorize these results either. The method of collecting statistical data for wine-growing production is inadequate, and the quantity of these data is insufficient for making high-quality decisions.

Opportunities:

- Uncultivated agricultural soil
- Structure of viticultural production
- New products made of grapes and wine
- Promoting the culture of consuming wine and grape products
- Proximity of the EU market

Allowing the use of uncultivated agricultural land, by granting a lease or concession, is an opportunity to expand wine-growing production. Legally defined and administratively facilitated conversion of forest soil or karst into agricultural soil is also an opportunity for expansion of viticultural production, because such soil is almost unusable for other agricultural crops. On such areas we already have vineyards in Blizanci and Crnopod, which yield high-quality crops. Increase in production of table grapes and production of seed-free grapes represent an opportunity for expansion of wine-growing production, because there is market space for these products in the domestic market but also in exportation because of the proximity of the EU market. Production of juices, grape desserts and wine liqueurs are also opportunities to expand the viticultural production. Promoting the culture of wine consuming and treating wine as foodstuff (like in most wine-growing countries) will lead to higher demand and lower prices of wine.



Slika 56. Boje jeseni
Figure 56. Automn colors

Nekvalitetna zakonska i loša institucionalna izgrađenost države demotivirajuće djeluje na odluku o pokretanju ili širenju vinogradarske proizvodnje. Proizvodnja sadnoga materijala autohtonih sorata vinove loze je vrlo mala po količini i nezadovoljavajuće zdravstvene ispravnosti, pa predstavlja ograničenje u širenju vinogradarske proizvodnje. Proizvodi od autohtonih sorata omogućavaju naglašavanje posebnosti vinogradarskoga područja. Dobra organiziranost vinogradara i vinara mogla bi umanjiti troškove proizvodnje i plasmana proizvoda na tržište, te umanjiti negativne učinke usitnjenosti poljoprivrednih površina. Loši i nedovoljni statistički podaci su loš temelj za donošenje odluka. Sadašnji, administrativni način prikupljanja statističkih podataka nije se pokazao dobrim rješenjem. Neuvezanost znanosti i proizvodnje otežava i usporava primjenu novih tehnologija u proizvodnji i preradi, kao i transfer znanja do proizvođača.

Sadašnje stanje vinogradarske i vinarske proizvodnje u BiH je prilično konfuzno, ali većina slabosti i ograničenja su administrativne naravi i mogu se riješiti kvalitetnim mjerama poljoprivredne politike. U prvom redu treba izraditi novi, kvalitetan temeljni dokument vinogradarske proizvodnje, a to je *Rajonizacija vinogradarstva BiH*. Zatim treba izgraditi

Threats (limitations):

- Soil
- Legal framework and institutional development level
- Production of planting material
- Level of organization of wine-growers and wine-makers
- Lack of coordination between science and production
- Global climate changes

Fragmentation of agricultural areas is a limitation to increase in wine-growing production because every kind of agricultural production is more expensive on smaller areas. The negativity of small agricultural areas in wine-growing and winemaking production is even more pronounced than in other types of agricultural production because of the importance of site for winemaking production. The inferior legal and poor institutional development of the state has a discouraging effect on decision to undertake or expand wine-growing production. Production of planting materials of autochthonous grapevine varieties is very small in volume and substandard in terms of health, so it represents a limitation in expansion of wine-growing production. Products of autochthonous varieties allow the special features of the wine-growing region to be emphasized. Good level of

kvalitetan zakonodavni okvir, donošenjem novih ili poboljšanjem postojećih zakona među kojima su: Zakon o vinu, Zakon o sadnom materijalu i introdukciji sorata, Zakon o ekološkoj proizvodnji, Zakon o vodama, Zakon o nasljeđivanju poljoprivrednoga zemljišta, Zakon o savjetodavnoj službi. Iz navedenih zakona treba izraditi kvalitetne pripadajuće podzakonske akte, te poraditi na provedbi zakona. Jednako tako treba poraditi na institucionalnoj izgrađenosti formiranjem savjetodavne službe, agencije za



Slika 57. Iskustvo prošlosti, zalog za budućnost
Figure 57. Experience from the past as a guarantee for the future

organization of wine-growers and wine-makers could decrease production and marketing costs and alleviate the negative effects of fragmentation of agricultural areas. Low-quality and insufficient statistical data are a poor foundation for decision-making. The present administrative method of collecting statistical data did not prove to be a good solution. Lack of coordination between science and production hinders and delays application of new technologies in production and processing, as well as transfer of knowledge to producers.

The present state of viticultural and winemaking production in B&H is rather confused, but most of weaknesses and limitations are administrative in nature and can be solved by quality measures of agricultural policy. In the first place it is necessary to draft a new, high-quality fundamental document of the wine-growing production, which is the "Zoning of viticulture of B&H." Then it is necessary to develop a high-quality legislative framework by adopting new or improving existing laws, which include "the Wine Act," "Law on planting material and introduction of cultivars," "Law on ecological production," "Law on Waters," "Law on inheritance of agricultural land," "Law on advisory service." It is necessary to develop high-quality accompanying bylaws from the specified laws, and make efforts to enforce the laws. Likewise, it is necessary to aim at institutional development by establishing an advisory service, agency for payments in agriculture, ecological production monitoring institutions, and other institutions arising from legal solutions. It would be necessary to define a different method of collecting statistical data from the wine-growing production, that will be a better foundation for making decisions and solutions essential for this type of production. To provide credit lines for establishment of multi-annual plantations because the primary agricultural production cannot cope with commercial interest rates. Funds for incentives in primary agricultural production need to be disbursed, with higher control and monitoring of the effects of these expended funds, for each agricultural production. Integration of agricultural sciences and production should be institutionalized in transfer of knowledge and new technologies, aiming at improving the production process.

plaćanja u poljoprivredi, institucije za nadzor nad ekološkom proizvodnjom i ostalih institucija koje proizlaze iz zakonskih rješenja. Trebalo bi definirati drugačiji način prikupljanja statističkih podataka iz vinogradarske proizvodnje, koji će biti kvalitetniji temelj za donošenje odluka i rješenja bitnih za tu vrstu proizvodnje. Osigurati kreditne linije za podizanje višegodišnjih nasada jer primarna poljoprivredna proizvodnja ne trpi komercijalne kamatne stope. Sredstva za poticaje u primarnoj poljoprivrednoj proizvodnji treba trošiti, uz veću kontrolu i praćenje učinaka tih utrošenih sredstava, za svaku poljoprivrednu proizvodnju. Uvezanost agronomskih znanosti i proizvodnje treba biti institucionalizirana u transferu znanja i novih tehnologija, a radi poboljšanja u proizvodnom procesu. Boljom interesnom povezanošću samih proizvođača mogu se bitno umanjiti troškovi proizvodnje, troškovi nabave opreme i materijala i troškovi nastupa na tržištu. Sve će to doprinijeti unapređenju te gospodarske djelatnosti i povećanje produktivnosti u proizvodnji grožđa i vina.

Better integration of producers based on common interests can considerably reduce production costs, equipment and materials procurement costs and marketing costs. All this will help to bring about improvement of this economic activity and increase in productivity in the production of grapes and wine.

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VINOGRADARSKO-VINARSKE MANIFESTACIJE

VITICULTURAL AND WINE EVENTS

Vinska cesta Hercegovine

Marin Sivrić

Herzegovina Wine Route

Marin Sivrić



Kao i većina vinogradarskih područja u svijetu i Hercegovina ima svoju vinsku cestu. Vinska cesta Hercegovine je, najkraće rečeno, gastro-turistički proizvod koji nastoji sve vrijednosti Hercegovine povezati s vinom i autohtonim kulinarskim specijalitetima, a slogan je vinske ceste: *S vinom kroz vrijeme*.

Ideja vinske ceste u Hercegovini egzistira već nekoliko desetljeća, a prvi pokušaji tzv. vinskih tura zabilježeni su osamdesetih godina prošloga stoljeća i njih možemo smatrati početcima vinskoga turizma Hercegovine. Tada je u okviru kombinata HEPOK planirano da se organiziraju vinske ture koje bi povezale vinarije u Mostaru, Čitluku, Ljubuškom i Stocu, a u turu bi bio uključen

Like most of wine-growing areas in the world, Herzegovina has its own wine route. In a nutshell, the Herzegovina Wine Route is a gastronomic and tourist product that aims to link all the values of Herzegovina with wine and authentic cuisine, and the slogan of the Wine Route is: "With wine through time."

The idea of a wine route in Herzegovina has existed for decades now and the first attempts at so-called *wine tours* in Herzegovina were reported in 1980s, and these can be considered as the beginnings of wine tourism of Herzegovina. Within the Hepok conglomerate, then it was planned to organize wine tours that would connect the wineries in Mostar, Citluk, Ljubuski and Stolac, and the tour

i posjet prirodnim ljepotama Hercegovine. U svakom hotelu trebala je biti izgrađena konoba u kojoj bi gosti uz kušanje hercegovačkih vina mogli kupiti čuveni hercegovački rezani duhan tzv. škiju. Prema tom projektu, vinske ture trebalo je povezati s turističkim destinacijama u Dalmaciji. Nažalost ta je ideja ostvarena tek dvadesetak godina kasnije.

Projekt *Vinske ceste Hercegovine,* od ideje do turističkoga proizvoda, provele su Turistička zajednica Hercegovačko-neretvanske županije i Udruga vinogradara i vinara Hercegovine tijekom 2006. i 2007. godine. U vrijeme provedbe projekta održani su brojni sastanci, seminari, radionice. Hercegovačkim vinarima, turističkim djelatnicima i ostalim sudionicima projekta u sjećanju su ostala studijska putovanja u nekoliko europskih regija gdje je vinski turizam dobro razvijen. Sve je to na kraju rezultiralo uspješnim završetkom projekta. Danas su u projekt *Vinske ceste* uključene 32 vinarije s područja cijele Hercegovine.

was also to include a visit to natural attractions of Herzegovina. In every hotel, it was planned to build a tavern, in which guests, while tasting Herzegovinian wines, would be able to get a pack of the renowned Herzegovinian fine-cut tobacco, "*škija*". According to this project, wine tours were to be connected with tourist destinations in Dalmatia. Unfortunately, this idea was achieved only twenty years later.

From a concept to the tourist product, the Herzegovina Wine Route project was implemented by the Tourist Board of the Herzegovina and Neretva County and the Association of Winegrowers and Winemakers of Herzegovina in 2006 and 2007. Many meetings, seminars and workshops took place during project implementation. Herzegovinian wine makers, tourist operators and other participants in the project remember study tours in several European regions where wine tourism is well developed. All of these eventually resulted in successful completion of the project. Today, 32 wineries



Slika 58. Vodopad Kravica
Figure 58. Waterfall Kravica

Ponuda *Vinske ceste Hercegovine* nije ograničena samo na prodaju i promociju vina i drugih poljoprivredni proizvoda koje članovi vinske ceste nude na svom poljoprivrednom gospodarstvu, nego su u nju uključene i druge atrakcije Hercegovine. Hercegovina nudi puno povijesnih lokaliteta kao što su: Stari Grad u Mostaru, Počitelj, Blagaj, Mogorjelo, Radimlja, ljubuška tvrđava, srednjovjekovni manastiri. Prirodne ljepote Hercegovine primjerice vrelo Bune, kanjon Neretve, slapovi Kravica, Hutovo blato, Popovo polje i brojne druge također su dio toga programa. U hercegovačkim muzejima sačuvani su nalazi i iskopine iz daleke povijesti. Upravo zbog toga, Hercegovina svakom gostu nudi šetnju kroz prostor i vrijeme. Mostar joj je glavni grad i zajedno s Međugorjem, hodočasničkim središtem, ljetovalištem Neumom i ostalim atrakcijama predstavlja jedno od najpoželjnijih turističkih i hodočasničkih odredišta u jugoistočnoj Europi.

Vinska cesta Hercegovine pri odabiru projektnoga područja uzela je u obzir područje uzgoja vinove loze u Hercegovini i moguće povezivanje s turističkim destinacijama u neposrednom susjedstvu. Tako se karta *Vinske ceste Hercegovine* prostire na općine Mostar, Čitluk, Ljubuški, Čapljina, Stolac i Trebinje odnosno za sada samo na područje uzgoja Žilavke i Blatine, a s namjerom širenja i na druge prostore Hercegovine.

Osim vinskih podruma koji su dio kulture i načina života Hercegovine, u kojima se izravno od proizvođača može saznati sve o tajnama proizvodnje najzdravijega i najhigijenskijega pića na svijetu, vinska cesta nudi i niz drugih sadržaja. Program *Vinske ceste* kombiniran je s različitim vinogradarskim i vinarskim manifestacijama koje se održavaju u Hercegovini. Restorani s hercegovačkim kulinarskim specijalitetima sastavni su dio ponude *Vinske ceste*. Ukratko, *Vinska cesta Hercegovine* je skup javnosti dostupnih podataka o odredištima ili točkama zanimljivim konzumentu odnosno posjetitelju.

Da bi se posjetilo *Vinsku cestu Hercegovine* nije potreban godišnji odmor, tjedan ili dva. Naprotiv, slobodan vikend, nekoliko neradnih dana pa čak i jedan dan bit će dovoljno gostima da naprave izlet ili posjet Hercegovini i uživaju u bosanskohercegovačkom Mediteranu. *Vinska cesta Hercegovine* je predstavljena u posebnoj

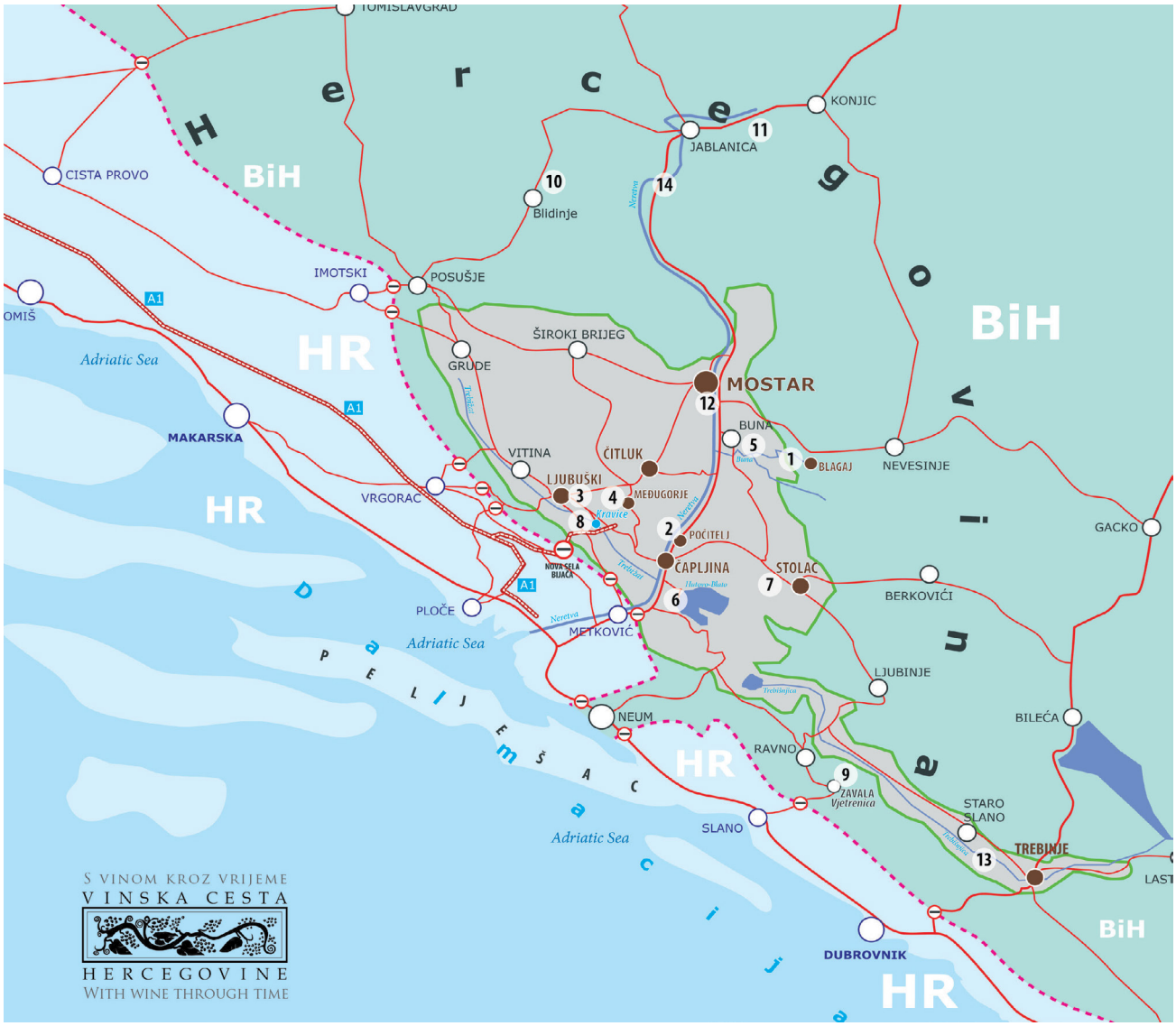
from all over Herzegovina have been involved in the wine route project.

Programs of the Herzegovina Wine Route are not limited only to sale and promotion of wines and other agricultural products that members of the wine route offer at their own agricultural estates, but it also includes other attractions of Herzegovina. Herzegovina offers many historical sites such as the Old City of Mostar, Pocitelj, Blagaj, Mogorjelo, Radimlja, the Ljubuski fortress, medieval monasteries. Natural attractions of Herzegovina, such as the spring of Buna, Neretva gorge, Kravica waterfalls, Hutovo Blato, Popovo field and many others are also part of this program. Herzegovinian museums treasure finds and excavated relics from ancient history. That is exactly why Herzegovina offers each guest a "walk" through space and time. Mostar is its capital and together with Medjugorje - the pilgrimage center, the summer resort of Neum and other attractions, it represents one of the most desirable regions in southeastern Europe.

While selecting the project area, Herzegovina Wine Route took into account the area of grape growing and possible connecting with tourist destinations in the immediate neighborhood. Thus the map of the Herzegovina Wine Route stretches across the municipalities of Mostar, Citluk, Ljubuski, Capljina, Stolac and Trebinje, i.e. for the time being it covers only the area of cultivation of Zilavka and Blatina, with a view of expanding to other areas of Herzegovina.

In addition to wine cellars which have been part of the culture and lifestyle of Herzegovina, where it is possible to find out directly from producers everything about the secrets of making the healthiest and the most hygienic drink in the world, the Wine Route offers a range of other programs. The wine route program is combined with various viticultural and oenologic events held in Herzegovina. Restaurants with Herzegovinian culinary specialties are an integral part of the wine route program. In short, the "Herzegovina Wine Route" is a collection of publicly available data on destinations or points interesting to consumer or visitor.

In order to visit the Herzegovina Wine Route, one does not need a vacation, a week or two. Instead, a free weekend, a few days off or even



Slika 59. Vinska cesta Hercegovine
Figure 59. Herzegovina vine route

1. Blagaj
2. Počitelj
3. Ljubuški
4. Međugorje
5. Buna
6. Park prirode Hutovo Blato
7. Stolac
8. Vodopad Kravice
9. Pećina Vjetrenica
10. Skijalište Blidinje
11. Planina Prenj
12. Mostar
13. Manastir Tvrdos
14. Rafting na Neretvi

1. Blagaj
2. Počitelj
3. Ljubuški
4. Međugorje
5. Buna
6. Natural Park Hutovo Blato
7. Stolac
8. Waterfall Kravice
9. Vjetrenica cave
10. Ski resort Blidinje
11. Prenj Mountain
12. Mostar
13. Monastery Tvrdos
14. Rafting on Neretva



brošuri i na mrežnoj stranici: www.vinskacesta.ba. Destinacije kroz koje prolazi treba posjetiti kako bi se Hercegovina doživjela onakva kakva zapravo i jest, a ona je kao Žilavka: obasjana suncem, umivena zelenom Neretvom i naslonjena na plavo more, te kao takva je jedan od bisera Mediterana.

Posjet *Vinskoj cesti Hercegovine* moguće je organizirati na dva načina, samostalno ili preko turističkih agencija. I jedan i drugi način nude neku svoju posebnost. Ako se posjet organizira samostalno, najbolje je to učiniti na mrežnoj stranici gdje će se naći svi elementi ponude i gosti sami mogu aranžirati svoje putovanje. Drugi je način posredni, gdje turističke agencije nude različite paket aranžmane *Vinske ceste Hercegovine*, a na gostima je da izaberu već ponuđene opcije ili u dogovoru s agencijom oblikuju budući aranžman. Kako se god odlučili, jedno je sigurno. Hercegovina će svakom posjetitelju iz kuta vina, prirodnih ljepota i starina izgledati zanimljivo i privlačno što će mu omogućiti vrlo intenzivan turistički doživljaj koji

one day will be enough for guests to make a trip or visit to Herzegovina and enjoy the Bosnian and Herzegovinian Mediterranean. The Herzegovina Wine Route is presented in an image brochure and on the wine route website (**www.vinskacesta.ba**). Destinations along the wine route should be visited in order to experience Herzegovina as it really is, and it is like Zilavka; sunlit, bathed by green Neretva and leaned against the blue sea, and as such it is one of the pearls of the Mediterranean.

Visits to the Herzegovina Wine Route can be organized in two ways, independently or through travel agencies. Both have some specifics. If a visit is organized independently, the best way to do it is by vising the Herzegovina Wine Route website, where all the elements offered can be found and guests can arrange their trip on their own. The other way is indirect, where travel agencies offer various package deals of the Herzegovina Wine Route, and it is up to guests to choose one of the options or in agreement with the agency form their intended deal. Whatever they choose, one thing is certain. From the viewpoint of wines,



Slika 60. Manastir Žitomislić (16. stoljeće) okružen vinogradima
Figure 60. Monastery Zitomislic (16th century) surrounded by vineyards

će ponijeti i podijeliti s prijateljima i poznanicima po povratku. Posjetitelji će uvidjeti da je slogan *S vinom kroz vrijeme* s razlogom odabran, te da je to do sada najpotpuniji regionalni turistički proizvod.

natural attractions and antiquities, every visitor will find Herzegovina interesting and attractive, which will provide him/her an exquisite tourist experience that s/he will take along and share with friends and acquaintances upon return. Visitors will realize that the slogan "With wine through time" was chosen for a reason, and that this is the most complete regional tourist product.

Dani berbe grožđa *Brotnjo*

Marin Sivrić

Brotnjo najblagorodniji vinski kraj u Bosni i Hercegovini je naziv srednjovjekovne župe čije se područje uglavnom poklapa s današnjim granicama općine Čitluk. Zahvaljujući bogom danim uvjetima i marljivosti svojih žitelja prepoznatljivo je po najboljim vinima Žilavke i Blatine. Vino koje bi, kako to napisa jedan poznati novinar, „moglo na svaki carsko-predsjednički dvor". Prvi pisani zapis o broćanskom vinu potječe iz 1353 godine i govori da je bosanski kralj Tvrtko došavši smiriti nemirnu Humsku vlastelu „u dobru volju" popio vrč dobra vina na Prozračcu u Brotnju.

Brotnjo Grape Harvesting Days

Marin Sivrić

Brotnjo, the most generous wine region in Bosnia and Herzegovina, is the name of the medieval parish whose territory mainly coincides with the present limits of the Citluk municipality. Thanks to God given conditions and diligence of its inhabitants, it is recognizable by the best wines of Zilavka and Blatina. As a well-known journalist put it, a wine that "could be at any imperial or presidential palace." The first written record of the Brotnjo wine originates from 1353 and says



Slika 61. Dani berbe grožđa
Figure 61. Grape harvesting days

Trganje (berba grožđa) u Brotnju je vrijeme ubiranja plodova cjelogodišnjega truda i ono se oduvijek obavljalo uz pjesmu i veselje i to su temelji manifestacije nazvane *Dani berbe grožđa Brotnjo*. Za žitelje općine Čitluk to je najvažniji kulturni događaj godine. Ta je vinogradarsko-vinarska manifestacija s najdužom tradicijom u Bosni i Hercegovini i jedna je od najstarijih u ovom dijelu Europe. Redovito se održava od 1956. godine.

Manifestacija ima svoj statut kojim je definiran datum održavanja kao i vrijeme trajanja, te se tako *Dani berbe grožđa* održavaju u mjesecu rujnu i to u prvom tjednu nakon crkvenoga blagdana

that the Bosnian King Tvrtko, coming to pacify the restless Hum nobility, "in good faith" drank a jug of good wine at Prozracac in Brotnjo.

Vintage (grape harvesting) in Brotnjo is the time of harvesting the fruit of a yearlong effort and it has always been accompanied by singing and joy, and these are the foundations of the event called "Brotnjo Grape Harvesting Days". This is the most important cultural event of the year for people of the Citluk municipality. This is the viticultural and winemaking event with the longest tradition in Bosnia and Herzegovina and one of the oldest in this part of Europe. It has been regularly held since 1956.



Slika 62. Izložba grožđa 1956. godine
Figure 62. Exhibition of grapes in 1956

Uzvišenja Svetoga Križa (8. rujna) i traju tri dana.

Organizacijski odbor je širok i čine ga predsjednik općinskoga vijeća, načelnik općine, ravnatelj Kulturno-informativnoga centra, predsjednik Matice hrvatske, predstavnik Udruge vinara i vinogradara Hercegovine, predstavnik Turističke zajednice te prema potrebi svi oni koji mogu dati svoj doprinos u organizaciji manifestacije.

Ciljevi su manifestacije:

- upoznavanje, zbližavanje i učvršćivanje zajedništva žitelja Brotnja i njihovih gostiju,
- očuvanje narodne baštine kroz prezentaciju izvornoga narodnog stvaralaštva,
- njegovanje i širenje amaterizma u kulturi,
- poticanje jačanja kulturnoga i sportskoga stvaralaštva,
- poticanje i razvijanje turističke ponude,
- poticanje razvoja poljoprivrede (vinogradarstvo i podrumarstvo),
- poticanje razvoja gospodarstva na području općine i njezina čvršćeg regionalnog povezivanja.

The event has its own statute defining the date and duration of the celebration, thus the "Grape Harvesting Days" are held in September, specifically in the first week after the church holiday "Exaltation of the Holy Cross" (8 September) and last for three days.

The Organizing Committee is wide and it consists of the President of the Municipal Council, the Mayor, the manager of Cultural and Information Center, the president of the Central Croatian Cultural and Publishing Society, representative of the Association of Winemakers and Winegrowers of Herzegovina, representative of the Tourist Board, and as necessary all those who can make their contribution in organization of the event.

Objectives of the event are:

- meeting, bringing together and strengthening the unity of Brotnjo residents and their guests,
- preserving national heritage by presenting the original popular creativity,
- nurturing and dissemination of amateurism in culture,

U prvim je godinama manifestacije bila lokalnoga karaktera i nastojalo se prikazati i pokazati dostignuća Brotnjaka u svim područjima djelovanja u protekloj godini, a napose u proizvodnji grožđa i vina. Osamdesetih godina 20. stoljeća manifestacija je programski i organizacijski nadopunjena. Poseban interes kod posjetitelja izazivali su nastupi estradnih zvijezda toga vremena, a mnogim Brotnjacima i posjetiteljima manifestacije u sjećanju su ostali i nastupi pjevača amatera Brotnja.

Okosnicu manifestacije uvijek su činili broćanski vinari sa svojim vinima koji daju priliku posjetiteljima manifestacije kušati taj plod trsa, a vinari bi za uzvrat bili pripravni dobiti kritike, dobre i loše kako bi vino sljedećih *Dana berbe grožđa* bilo još bolje. U općini Čitluk ima dvadesetak modernih vinarija, što je više od trećine svih registriranih vinarija u Bosni i Hercegovini.

Predstavljanje kulturno-umjetničkih društava je nezaobilazan dio programa manifestacije, a njihov mimohod ulicama Čitluka i izvedbene točke daju manifestaciji odlike spektakla. Predstavljanje knjiga, izložbe slika, sportska nadmetanja, stručna predavanja iz područja vinarstva i vinogradarstva

– encouraging the strengthening of cultural and sports creativity,
– promoting and developing tourist attractions,
– encouraging the development of agriculture (viticulture and oenology)
– encouraging the development of economy in the municipality area and its stronger regional integration.

In the early years, the event had a local character, and tended to present and demonstrate achievements of the Brotnjo inhabitants in all fields of activity in the past year, and especially in the production of grapes. The event was updated in terms of program and organization in 1980s. Performances of pop stars of the time aroused a particular interest in visitors, and many residents of Brotnjo and visitors of the event keep in memory performances of amateur singers of Brotnjo.

The backbone of the event has always been the Brotnjo wine-makers with their wines that provide visitors of the event an opportunity to taste this fruit of vines, while wine-makers would in turn be prepared to receive criticism, good and bad, in order for wine to be even better in the next “days of grape harvest” . The municipality of Citluk has



Slika 63. S proslave dana berbe grožđa
Figure 63. Celebration of grape harvest days

samo su dio programa te manifestacije. Posljednjih godina organizacijski odbor manifestacije tiska publikaciju obrazovno-promotivnoga karaktera koja je ujedno i dobar podsjetnik budućim generacijama. *Dani berbe grožđa* je manifestacija koja je davno prerasla lokalne okvire i ona je već dugi niz godina regionalna i međunarodna manifestacija.

Običaji uz mlado vino

Jure Beljo

Tradicija blagoslova i kušanja mladoga vina postoji u različitim krajevima, održava se u različito vrijeme i gotovo svugdje na poseban način. U većini hercegovačkih vinogradarskih područja bačve se nakon punjenja moštom nisu zatvarale do blagdana Svih svetih, odnosno Dušnog dana, 2. studenog. Tada bi se kušalo novo vino, zatvarale bi se bačve jer se vjerovalo da je do tada mošt potpuno prevreo i pretvorio se u vino. Bio je to kod malih podrumara poseban ritual i prava svečanost. Susjedi i prijatelji bi obično išli od jednoga do drugoga podruma, kušali vino uz pršut ili neke druge hercegovačke specijalitete.

No pred naletom moderne tehnologije mijenja se i tradicija. Sve je više velikih podrumara, a važnost se malih seoskih podruma sve više gubi. Po selima se u gotovo svim podrumima sve više upotrebljavaju moderni vinski sudovi od inoksa, a drvene bačve postupno nestaju. Nestaje i stara tradicija kušanja mladoga vina na Dušni dan. Kako bi se ipak taj lijepi i stari običaj održao, pobrinuli su se neki podrumari i udruge i od nekadašnjega tradicionalnog kušanja mladoga vina napravili poseban događaj i ugođaj. Na temeljima drevnih običaja i tradicije stvara se nova tradicija. U Hercegovini su trenutačno tri manifestacije koje zamjenjuju nekadašnji običaj kušanja mladoga vina i koji postupno prelaze u tradiciju. To su *Kušanje mladoga vina u Čitluku*, *Martinje* i *Andrinje*.

Kušanje mladoga vina

U Čitluku se već petnaestak godina održava manifestacija *Kušanje mladoga vina*.

about twenty modern wineries, which is more than a third of all registered wineries in Bosnia and Herzegovina.

Presentation of cultural clubs is an essential part of the the event and their parade through the streets of Citluk and performance acts give the event the characteristics of a spectacle. Presentation of books, exhibitions of paintings, sports contests, expert lectures in the field of wine making and viticulture are only part of the program of this event. In recent years, the organizing committee of the event prints a publication of educational and promotional character that is also a good reminder to future generations. Days of Grape Harvesting is an event that has long ago outgrown its local framework and for many years it is a regional and international event.

New wine traditions

Jure Beljo

The tradition of blessing and tasting new wine exists in different regions, it takes place at different times and almost everywhere in a specific way. In most Herzegovinian wine-growing areas, barrels were not closed after filling with must until All Saints' Day, or All Souls' Day, 2 November. Then the new wine would be tasted, barrels would be closed because it was believed that by then must would be fully fermented and transformed into wine. For small wine makers, that was a special ritual and a real festivity. Neighbors and friends would usually go from one cellar to another, tasting wine over ham or some other Herzegovinian specialties.

But the tradition is changing under the impact of modern technology. There are more and more major wine makers, and the importance of small village cellars is increasingly lost. Modern stainless steel wine containers are increasingly used in villages in almost all cellars, and wooden barrels gradually disappear. The old tradition of tasting new wine on All Souls' Day also disappears. Still some wine makers and associations have taken care to maintain this beautiful and ancient custom and turned the former traditional tasting of new wine into a special event and experience.

Manifestacija se održava 3. studenog svake godine kako bi se zadržalo sjećanje na višestoljetni običaj u Brotnju. Organizator je u početku bila Vinarija *Čitluk*, a kasnije se ta manifestacija organizira u suradnji s Maticom hrvatskom, Turističkom zajednicom i općinskim poglavarstvom Čitluk. Organizaciju toga događanja sponzoriraju i druge institucije. Primjerice tehničku pomoć povremeno pruža Regionalna razvojna agencija za Hercegovinu (REDAH), a jedne je godine potporu dala Japanska agencija za međunarodnu suradnju (JICA) uz sudjelovanje japanskoga veleposlanika u Bosni i Hercegovini.



Slika 64. Simbolično otvaranje bačve
Figure 64. A symbolic opening of the barrel

Kušanje mladoga vina preraslo je u jedinstvenu gospodarsku, ali isto tako kulturnu i turističku manifestaciju prepoznatu u cijeloj Bosni i Hercegovini, ali i izvan njezinih granica. Ta je manifestacija postala pravi vinski festival jer se tijekom kušanja mladoga vina za goste priređuju različiti prateći sadržaji od glazbe, poezije, folklora i slično, a uz kušanje vina obvezni su broćanski kulinarski specijaliteti. To je prigoda da Vinarija *Čitluk* i još neke vinarije iz Brotnja u druženju sa svojim poslovnim partnerima promoviraju svoje proizvode, ponajprije vrhunsku kakvoću izvornih hercegovačkih vina Žilavke i Blatine, te drugih

It is on the foundations of ancient customs and traditions that a new tradition is being formed. In Herzegovina there are currently three events that replace the former custom of tasting new wine and that gradually evolve into tradition. These are Tasting of New Wine in Citluk, St. Martin's Feast and St. Andrew's Feast.

Tasting of New Wine

The event Tasting of New Wine is organized in Citluk for over fifteen years now. The event is held on 3 November each year in order to keep the memory of the centuries-old custom in Brotnjo. Initially the organizer of this event was the Citluk winery, and later it is organized in cooperation with the Central Croatian Cultural and Publishing Society, the Tourist Board and the municipal government of Citluk. In some years organization of the event is sponsored by other institutions too. For example, technical assistance is occasionally provided by the Regional Development Agency for Herzegovina (REDAH), and in one year support was given by the Japanese International Cooperation Agency (JICA) with the participation of the Japanese Ambassador to Bosnia and Herzegovina.

Tasting of New Wine has grown into a unique economic, but also cultural and tourist event recognized throughout Bosnia and Herzegovina, but also beyond the borders of Bosnia and Herzegovina. This event has become a true wine festival because during the event of Tasting of New Wine various accompanying attractions are organized for guests from music, to poetry, to folklore and the like, and wine tasting is accompanied by the popular Brotnjo culinary specialties. This is an opportunity for the winery of Citluk and some other wineries from Brotnjo, while socializing with their business partners, to promote their products, primarily the superior quality of the original Herzegovinian wines Zilavka and Blatina, as well as other products which are recently more and more numerous. All of these are the reasons why every year numerous business partners and other guests willingly visit this already traditional event.

proizvoda kojih je u posljednje vrijeme sve više. Sve su to razlozi da brojni poslovni partneri i drugi gosti rado dolaze svake godine na tu sada već tradicionalnu manifestaciju.

Martinje

U sjevernoj Hrvatskoj i Sloveniji na Dan svetoga Martina, 11. studenog, njeguje se tradicionalni pučki običaj simboličkoga prevođenja mošta u mlado vino („krštenje vina“). Sveti Martin (Sambotel, Mađarska, 316./317. – Tours, Francuska, 11. studenoga 397.) katolički je svetac, biskup grada Toursa. Otac toga sveca bio je rimski časnik. Sinu je dao ime Martin po rimskome bogu rata Marsu, očekujući da će i sin nastaviti vojnu karijeru. Međutim Martin je prešao na kršćansku vjeru i postao uzoran kršćanin i duhovnik, a kasnije je izabran za biskupa. Zaštitnik je Francuske, vinara, vinogradara, vojnika, konjanika, izliječenih alkoholičara, uzgajivača konja i gusaka. Volio je i propagirao dobru vinsku kapljicu. Legenda kaže da je sveti Martin uveo ceremonijal krštenja mošta, što je do toga vremena bilo zabranjeno, jer se smatralo da je to poganska svečanost. Martinje je uvijek bilo važan događaj za svakoga vinogradara i vinara, kao i za svakoga ljubitelja plemenite vinske kapljice, jer se prema pučkoj tradiciji na Dan sv. Martina mošt pretvara u vino. Običaj Martinja danas se njeguje u sjeverozapadnim predjelima Hrvatske, te u Slavoniji, dok je „krštenje mošta“ u Dalmaciji i Hercegovini novijega datuma. Posljednjih godina po ugledu na neka područja Hrvatske, u Hercegovini se počinje uvoditi taj običaj. Za sada u tome prednjače Vinarija *Zadro* u Domanovićima i Vinarija *Stolac*. Vinarija *Zadro* je tu manifestaciju počela obilježavati prije desetak godina, kao prva u Hercegovini, i tu je već postala tradicija. Na Dan svetoga Martina u tim se vinarijama uz simbolično „krštenje mošta“ druže poslovni partneri, vinogradari i prijatelji dobre kapljice, uživaju u plodovima hercegovačkih vinograda i ugovaraju nove poslove.

Andrinje

Vjerojatno najpoznatija vinarska manifestacija u Hercegovini koja je stekla kultni status kao

St. Martin’s Feast

Northern Croatia and Slovenia on St. Martin’s Day, 11 November, cherish the traditional folk custom of symbolic conversion of must into new wine (“baptism of wine”). **St. Martin** (Szombathely, Hungary, 316./317. - Tours, France, 11 November 397.) - the Catholic saint, bishop of the town of Tours. Father of this saint was a Roman officer. He named his son Martin after Mars, the Roman god of war, expecting the son to pursue a military career. But Martin was converted to the Christian faith and became an exemplary Christian and monk, and later was elected bishop. He is the protector of France, wine-makers, wine-growers, soldiers, horsemen, recovered alcoholics, breeders of horses and geese. He liked and promoted good wine. The legend says that Saint Martin introduced the ceremony of baptizing of must, which had been forbidden by that time, because it was considered to be a pagan feast. St. Martin’s Feast has always been an important event for every wine-grower and wine-maker, as well as for every lover of good wine, because according to popular tradition it is on St. Martin’s Day that must turns into wine. The custom of St. Martin’s Feast is cherished in northwestern regions of Croatia and in Slavonia, while baptism of must in Dalmatia and Herzegovina is more recent. Following the example of some areas of Croatia, this custom has been introduced in Herzegovina in recent years. For the time being, this has been pioneered by the winery Zadro in Domanovici and the Stolac Winery. The winery Zadro began to mark this event ten years ago being the first in Herzegovina, and that has already become tradition in this winery. In these wineries on St. Martin’s Day, accompanied by a symbolic “baptism of must”, business partners, wine-growers and friends of good wine socialize, enjoy the fruits of Herzegovinian vineyards and negotiate new deals.

St. Andrew’s Feast

St. Andrew’s Feast is probably the best known wine event in Herzegovina that has gained a cult status like Herzegovinian St. Martin’s Feast, and is held in the Coric family cellar in the village of Paoca in the municipality of Citluk. Paoca is a picturesque

hercegovačko Martinje je Andrinje, a održava se u obiteljskom podrumu *Ćorić* u selu Paoči u općini Čitluk. Paoča je pitoreskno selo u vinorodnom Brotnju, a u povijesnim izvorima prvi put se spominje1432. godine. Vinogradarstvo u Paoči ima veoma dugu tradiciju, a poznati franjevac i kroničar Hercegovine iz 19. stoljeća fra Petar Bakula u šematizmu župa iz 1867. piše da se Paoča odlikuje "proizvodnjom izvrsnog vina". Paoča je rodno mjesto još jednog čuvenog franjevca fra Didaka Buntića, kojega kao prosvjetitelja, narodnoga tribuna i velikoga humanista štuje cijela Hercegovina.

village in wine-growing Brotnjo, and in historical sources it was mentioned first in 1432. Viticulture in Paoca has had a very long tradition, and the famous Franciscan and chronicler of Herzegovina from the 19th century, Father Petar Bakula wrote in the shematism of parishes of 1867 that Paoca was characterized by "production of excellent wine." Paoca is the birthplace of another famous Franciscan, Father Didak Buntic, who has been honored as an educator, national tribune and great humanist by the entire Herzegovina.

The Coric family has been engaged in viticulture for more than 350 years. Generations of Corices



Slika 65. Paoča
Figure 65. Paoča

Obitelj Ćorić bavi se vinogradarstvom više od 350 godina. Generacije Ćorića ovladale su vještinama i znanjima u uzgoju vinove loze, podrumarstvu i proizvodnji izvrsnih vina. Kao kruna tih iskustava i tradicije izgrađen je 1994. godine moderan podrum kapaciteta 5.000 hl. Utemeljitelj vinarije bio je Andrija Ćorić otac današnjih vlasnika, a vinarija je po njemu nazvana Podrumi Andrija. Podrumi Andrija je danas jedan od većih i svakako među najuspješnijim vinskim podrumima u Hercegovini s raznovrsnim asortimanom proizvoda, od vrhunskih vina Žilavke i Blatine, likera, rakije travarice do kuhanog vina, namijenjenoga skijalištima. Trećinu proizvodnje vinarija izveze na tržište deset europskih zemalja, a o kakvoći proizvoda te vinarije govori činjenica

mastered the skills and knowledge in viticulture, oenology and preparation of excellent wines. To crown these experiences and traditions, a modern cellar with the capacity of 5,000 hl was built in 1994. The founder of the winery was Andrija Coric, father of present owners, and the winery was named after him, "Podrumi Andrija". Podrumi Andrija is today one of the largest and certainly among the most successful wine cellars in Herzegovina with diverse range of products, from premium wines Zilavka and Blatina, liqueurs, herb-flavored brandy to "mulled wine" intended for ski resorts. The winery exports one third of its production to markets of ten European countries and an evidence of the quality of products of this winery is the fact that the famous

da poznata vinska asocijacija *Wine Professional Amsterdam Gastronomy* iz Nizozemske vino Žilavka Andrija (berba 2009.) uvrstila u svjetski katalog prodaje vina u 2012. godini.

Kako bi sačuvali uspomenu na osnivača vinarije i vrsnoga vinogradara i vinara, njegovi su nasljednici 2007. godine ustanovili posebnu manifestaciju i nazvali je Andrinje. Zapravo je ta manifestacija nastavak okupljanja u starom podrumu koji je u isto vrijeme priređivao njegov vlasnik. Budući da je blagdan svetoga Andrije, 30. studenog, Andrinje se održava posljednjeg vikenda mjeseca studenoga svake godine, pod geslom *uvijek žedan, nikad pijan*. Nakon što mjesni župnik blagoslovi mlado vino, vinograde i vinske podrume počinje vinska „fešta". Na Andrinju se zna okupiti više stotina gostiju, od vinarijinih kooperanata, poslovnih partnera do mnogih uglednika iz gospodarskoga, javnoga, kulturnoga

wine association "Wine Professional Amsterdam gastronomy" from the Netherlands included the wine Zilavka Andrija (vintage 2009) into the world catalog of wines sold in 2012.

To cherish the memory of the winery founder and excellent winemaker, his successors established the special event in 2007 and named it Andrinje - St. Andrew's Feast. In fact, this event is a continuation of the gathering in the old cellar that was organized at the same time by its owner. Since the feast of Saint Andrew is on 30 November, St. Andrew's Feast is held in the last weekend of November each year, under the motto "always thirsty, never drunk." After a local parish priest blesses the new wine, vineyards and wine cellars, the wine "feast" begins. St. Andrew's Feast is known to gather several hundreds of guests, from winery contractors, business partners, to many dignitaries from economic, legal, cultural and



Slika 66. Blagoslov mladog vina
Figure 66. Blessing of fresh wine

i vjerskoga života općine Čitluk, drugih područja Bosne i Hercegovine, te izvan granica Bosne i Hercegovine. Uz ugodno druženje degustiraju se visoko kvalitetni proizvodi Podruma Andrija i kušaju domaći specijaliteti.

Andrinje je danas jedinstvena obiteljska tradicija kušanja mladoga vina kao dio tradicije, kulture i običaja vinogradarske i vinarske Hercegovine. Na njemu se gostima iz različitih područja i društvenih slojeva predstavljaju plodovi hercegovačke zemlje i podneblja, kultura življenja ljudi toga kraja i stoljetni običaji vinorodnoga broćanskog područja. Stoga je sasvim razumljivo da je Turistička zajednica Federacije Bosne i Hercegovine Andrinje uvrstila u kalendar važnijih turističkih događaja u Bosni i Hercegovini.

Manifestacije u Republici Srpskoj

Tatjana Jovanović-Cvetković, Jure Beljo

U Republici Srpskoj postoje četiri tradicionalne vinogradarsko-vinarske manifestacije od kojih su dvije u Hercegovini i dvije u sjevernoj Bosni. Prva manifestacija je ***Početak rezidbe vinove loze*** na Dan svetog Trifuna. To je tradicionalni pučki običaj u pravoslavnim vinogradarskim područjima. Sveti Trifun je kršćanski svetac, živio je u trećem stoljeću, a po narodnom vjerovanju zaštitnik je vinogradara, vinara i gostioničara, nešto slično kao sveti Martin u katoličkim područjima. Dan svetoga Trifuna po pravoslavnom kalendaru obilježava se 14. veljače, a po katoličkom kalendaru 1. veljače. Na taj se dan simbolično zarezuju trsovi vinove loze i uz lomljenje kruha zalijevaju se prošlogodišnjim vinom. Vjeruje se da će tako vinograd povratiti snagu poslije dugoga zimskog mrtvila, te da će loza u proljeće bujati. Simboličnu rezidbu loze obično prati narodna veselica i druženje vinogradara uz vino i domaće specijalitete.

Trebinjski dani vina

To je manifestacija koju, u organizaciji Udruženja vinogradara i vinara istočne Hercegovine *Vinos* iz Trebinja, priređuju podrumari iz istočne Hercegovine. Trebinjsko područje ima tradiciju vinogradarstva iz antičkih vremena. U blizini Trebinja postojala je rimska vila rustika koja

religious life of the municipality of Citluk, other areas of Bosnia and Herzegovina, and beyond the borders of Bosnia and Herzegovina. While having a good time together, people taste high quality products of Podrumi Andrija and sample local specialties.

Nowadays, St. Andrew's Feast is a unique family tradition of tasting new wine as part of tradition, culture and customs of the wine-growing and wine-making Herzegovina. That is where guests from different areas and social classes are presented with fruits of Herzegovinian terroir, local people's culture of life and centuries-old traditions of the wine-growing Brotnjo area. Therefore, it is quite natural that the Tourist Board of the Federation of Bosnia and Herzegovina has included St. Andrew's Feast in the calendar of major tourist events in Bosnia and Herzegovina.

Events in the Republic of Srpska

Tatjana Jovanović-Cvetković, Jure Beljo

In the Republic of Srpska there are three traditional viticultural and wine events, of which two are in Herzegovina and one in Banja Luka. The first event is the **start of pruning vines** on St. Tryphon's Day. This is a traditional folk custom in the Orthodox wine-growing areas. Saint Tryphon is a Christian saint, who lived in the third century, and in popular belief he is the protector of wine-growers, wine-makers and innkeepers, something like Saint Martin in Catholic areas. St. Tryphon's Day is marked on 14 February in the Orthodox calendar, and on 1 February in the Catholic calendar. On that day, grapevines are symbolically cut and while breaking bread they are sprinkled with wine from the previous year. It is believed that vineyard will thus regain its strength after a long winter stagnation, and that the vines will thrive in the spring. The symbolic pruning of vines is usually accompanied by a folk party and socializing of wine-growers over wine and local specialties.

The Trebinje Wine Days

It is an event prepared by wine-makers of Eastern Herzegovina, and organized by the Association of Winegrowers and Winemakers



Slika 67. Tri generacije porodice Vukoje u rezidbi vinove loze na sv. Trifuna
Figure 67. Three generations of family Vukoje during prunning of vines at St. Tryphun's day

je, između ostaloga, imala vinograde i vinski podrum. Neki manastirski podrumi s toga područja spominju se u srednjem vijeku. Stoga je ta manifestacija nastavak stoljetne tradicije uspješnoga podrumarstva i vinarstva trebinjskoga kraja. Manifestacija Trebinjski dani vina utemeljena je 2007. godine radi prezentacije proizvoda vinara istočne Hercegovine i služi afirmaciji vinogradarstva i vinarstva kao važne gospodarske djelatnosti toga dijela Republike Srpske. Pokrovitelj je manifestacije Vlada Republike Srpske, što pokazuje koju važnost vlasti pridaju razvoju vinogradarstva i vinarstva. Iz godine u godinu tu manifestaciju posjećuje sve veći broj gostiju iz zemlje i inozemstva, pa se uz kušanje vina i domaćih specijaliteta sklapaju i uspješni poslovi.

Banjalučki dani vina

Od 2002. godine u Banjoj Luci održavaju se *Dani vina*. Organizatori manifestacije su Rotary klub *Banja Luka* i Udruženje vinogradara i vinara Banjalučke regije, a potporu im svake godine daje najpoznatiji vinar iz Republike Srpske Podrum *Vukoja*. Cilj je te manifestacije pružanje podrške razvoju vinogradarstva i vinarstva Banjalučke regije. U prošlosti je na tom području

of Eastern Herzegovina "Vinos" from Trebinje. The Trebinje area has a tradition of viticulture from ancient times. Near Trebinje, there used to be a Roman rustic villa that had a vineyard and wine cellar, among other things. Some monastery cellars in this area are referred to in the Middle Ages. That is why this event is a continuation of the centuries-old tradition of successful wine cellars and wine-making of the Trebinje region. The event Trebinje Wine Days was established in 2007 for presentation of products of eastern Herzegovina wine-makers and aims at promoting viticulture and wine-making as an important economic activity in this part of the Republic of Srpska. The sponsor of this event is the Government of the Republic of Srpska, which is indicative of the significance that the authorities attach to development of viticulture and wine-making. From year to year, this event is visited by a growing number of visitors from the country and abroad, and over wine and local specialties successful business deals are being concluded.

Banja Luka Days of Wine

Since 2002, the **Days of Wine** are organized in Banja Luka. The event is organized by the Rotary Club of Banja Luka and the Association of

vinogradarstvo bilo razvijeno, ali je u 20. stoljeću vinova loza gotovo potpuno iščezla. No posljednjih petnaestak godina počinje revitalizacija te kulture i iz godine u godinu površine pod vinogradima se povećavaju. Na *Danima vina* vinari Banjalučke regije predstavljaju svoje proizvode, gosti i stručnjaci posjećuju najbolje vinograde i podrume. U okviru manifestacije održavaju se stručna predavanja, a dodjeljuju se nagrade najboljim vinima i najboljim proizvodnim mladim vinogradima kako bi se stimulirala proizvodnja grožđa i kakvoća vina. Na kraju manifestacije u čast vina održava se i vinski bal.

Dani vina u Laktašima

Druga vinska manifestacija na području sjeverne Bosne je *Dan vina* u Laktašima započeta 2003. godine. Cilj je manifestacije propagiranje i afirmacija proizvodnje grožđa i vina na tom području. Manifestacija ima stručni karakter, ali je praćena brojnim kulturnim, zabavnim i umjetničkim sadržajima. Tijekom manifestacije organizira se degustacija vina proizvedenih na

Winegrowers and Winemakers of the Banja Luka region, and every year they are supported by the best known wine-maker of the Republic of Spska, Podrum Vukoja. The goal of this event is to support the development of viticulture and oenology of the Banja Luka region. Viticulture was developed in this area in the past, but vines almost completely disappeared in the 20th century. But the revival of this crop has begun in the last fifteen years, and year after year the area of vineyards has been increasing. On the Days of Wine, wine-makers of the Banja Luka region present their products, guests and experts visit the best vineyards and cellars. Professional lectures are held as part of the event, and prizes are awarded to the best wines and best young production vineyards in order to stimulate production of grapes and quality wines. The event honoring wine ends with the Wine Ball.

Laktasi Wine Day

The other wine event in the area of northern Bosnia is the „**Wine Day**“ in Laktasi launched in 2003. The aim of the event was promotion and



Slika 68. Nagradno ocjenjivanje vina u Laktašima
Figure 68. Evaluation of wine in Laktasi



Slika 69. Banjalučki dani vina
Figure 69. Banja Luka wine days

području općine Laktaši. U 2014. godini bilo je prijavljeno 40 uzoraka vina za ocjenjivanje, što govori o ubrzanom razvoju vinogradarstva i vinarstva na tom području, na kojemu sve do nedavno nije uopće bilo vinove loze.

Do Drugoga svjetskog rata, dok je u banjalučkom kraju postojalo koliko-toliko razvijeno vinogradarstvo, održavala se u vrijeme berbe grožđa pučka veselica pod nazivom *Berba grožđa*. Priredba se održavala pod lampionima u kantini kod Pilane nedaleko od Banje Luke. Na tu manifestaciju dolazili su stanovnici Banje Luke i okolnih mjesta, a društvo se zabavljalo i veselilo uz pijenje mladoga mošta. Kako je u ratu i prvim poratnim godinama nestalo vinove loze na tom području, ugasila se i ta, među Banjalučanima popularna manifestacija.

recognition of production of grapes and wine in this area. The event has a professional character, but it is accompanied by numerous cultural, entertaining and artistic attractions. Tasting of wines produced in the municipality of Laktasi is organized during the event. In 2014, there were 40 samples of wine registered for evaluation, indicating a rapid development of viticulture and winemaking in this area, where vines did not exist at all until recently.

Before the Second World War, while relatively developed grape growing existed in the Banja Luka region, the folk celebration called "**Grape harvesting**" was held at the time of grape harvest. The event was held under lanterns in the canteen near the sawmill not far from Banja Luka. The event was visited by residents of Banja Luka and surrounding settlements, and the crowd were entertaining and enjoying themselves while drinking new must. Since grapevine disappeared from the area during the war and in the first postwar years, so this event popular among Banja Lukers went out too.

VINOGRADARSKE I VINARSKE ASOCIJACIJE

Jure Beljo

Počeci udruživanja vinogradara

Zadružni pokret javlja se u drugoj polovini 19. stoljeća kao reakcija na gospodarski i socijalni poredak koji je stvorio liberalni i gramzljivi kapitalizam. Temeljna su načela zadrugarstva da sačuva privatnu svojinu, ali da onemogući profit od rente i kamata. Zadaća mu je da ljude nauči upravljati zajedničkom imovinom u vlastitom interesu; da umjesto konkurencije i međusobne borbe postavi načela uzajamne pomoći i solidarnosti. Zadruga zapravo štiti seljaka u liberalnom kapitalističkom okružju. Moglo bi se reći da je seljačko zadrugarstvo temeljeno na načelima na kojima su stoljećima živjele i radile kućne, obiteljske zadruge pa kako tvrdi poznati francuski ekonomist Charles Gide *zadružni sustav potječe iz duše samoga naroda*.

Prve seljačke zemljoradničke zadruge u Hercegovini osnivaju se početkom 20. stoljeća ili kao zadruge općega tipa ili kao kreditne zadruge. Specijalizirane zadruge, među njima i vinogradarske, odnosno vinarske, pojavile su se nešto kasnije. Osnivanje vinarskih i vinogradarskih zadruga nastalo je iz potrebe vinogradara da zaštite svoju proizvodnju i dobiju odgovarajuću cijenu za svoje grožđe. Hercegovački vinogradari kao mali proizvođači nisu imali dovoljno podrumarskih kapaciteta pa su grožđe uglavnom prodavali većim podrumarima ili trgovcima vinom. Ovi su ih često ucjenjivali pa su vinogradari bili prepušteni na milost i nemilost velikim podrumarima i vinarskim trgovcima. Trgovcima vinom i podrumarima nije odgovaralo udruživanje vinogradara jer su gubili monopol, pa su na sve načine nastojali onemogućiti formiranje zadruga.

VITICULTURAL AND WINE ASSOCIATIONS

Jure Beljo

Beginings of winegrowers' association

In the second half of the 19th century, the cooperative movement emerged in response to the economic and social order formed by liberal and greedy capitalism. The fundamental principle of cooperative movements was to preserve private property, but to prevent profits from rents and interests. Its goal was to teach people how to manage common property in their own interest; instead of competing and fighting each other, to establish principles of mutual support and solidarity. A cooperative actually protects farmer in a liberal capitalist environment. It could be said that the farming cooperatives system is based on the principles on which communal homes or families had lived and worked for centuries and, as the famous French economist Charles Gide claims, "the cooperative system comes from the soul of people themselves."

First farmers' cooperatives in Herzegovina were established in the early 20th century, either as cooperatives of general type or as credit unions. Specialized cooperatives, including wine-growers' or wine-makers' ones, emerged a little later. Establishing of wine-makers' and wine-growers' cooperatives resulted from the need of wine-growers to protect their production and get an appropriate price for their grapes. As small producers, Herzegovinian wine-growers did not have sufficient cellar capacities, so they generally sold grapes to major wine-makers or wine merchants. These often blackmailed them, and so wine-growers were left at the mercy of big wine-makers and wine merchants. Associating of wine-growers did not suit wine merchants and wine-makers because they were losing their monopoly,

Uspon i pad zadrugarstva

Prvi registrirani oblik udruživanja vinogradara bili je Vinogradarsko dioničko društvo u Trebinju, osnovano 1909. Društvo je, kako piše u Pravilima Društva, osnovano radi osiguranja bolje cijene grožđa i unapređenja vinogradarstva. Sve zemljoradničke zadruge u Hercegovini koje su do tada bile osnovane imale su nacionalni predznak, bile su muslimanske, srpske ili hrvatske. Vinogradarsko dioničko društvo je prva zemljoradnička udruga u kojoj su članovi direkcije i nadzornoga vijeća, a potom i dioničari bili iz sva tri naroda. Društvo je bilo ustrojeno po pravom zadružnom načelu. Zadrugari su bili vlasnici, za otkupljeno grožđe primali su akontaciju, a potpuna isplata, kao i raspodjela dobiti obavljana je nakon prodaje vina. Primjerice u 1910. godini, dakle prvoj godini nakon osnivanja, dobitak je iznosio 8.380 kruna. Društvo je imalo vlastiti podrum, a namjeravali su iz ostvarene dobiti graditi nove podrume.

Druga udruga vinogradara i vinara bila je Prva hercegovačka vinarska zadruga, osnovana u Mostaru 1911. godine. Gotovo svi veliki vinski podrumi i vinarski trgovci u to vrijeme nalazili su se u Mostaru i svi su oni bili protiv osnivanja vinogradarske ili vinarske zadruge u Mostaru. No ta je zadruga ipak osnovana i bavila se prometom vina na veliko u ime svojih zadrugara.

Za vrijeme Prvoga svjetskog rata stagniralo je vinogradarstvo i vinarstvo, a zamro je također rad zadruga. Iako su obje navedene zadruge bile u registru, sve do kraja Prvoga svjetskog rata njihova aktivnost bila je svedena na minimum, a 1918., nakon stvaranja nove države, prestale su s radom. No nakon rata ponovo se pokušava obnoviti vinogradarstvo i udruge vinogradara. U cilju unapređenja vinogradarstva u novoj državi, Kraljevini Jugoslaviji, u Beogradu je osnovan glavni savez jugoslavenskih vinogradara. Da bi savez na razini države mogao uspješno djelovati, podijeljen je na pokrajinske saveze. Početkom 1921. godine u Hercegovini je osnovan Savez vinogradara za Hercegovinu. Tih je prvih poslijeratnih godina filoksera uništila dobar dio vinograda u Hercegovini, a kao posljedica gospodarske krize u cijeloj zemlji nastupila je i vinska kriza. Stoga su se taj put u osnivanje i rad Saveza aktivno uključili vinari i vinski trgovci.

Rise and decline of cooperative movement

The first registered form of association of wine-growers was the Wine Growers' Stock Company in Trebinje, founded in 1909. As written in the rules of the company, the Company was established to ensure better prices of grapes and improvement of viticulture. All cooperatives in Herzegovina that had been established by then had a national mark, they were Muslim, Serbian or Croatian. The Wine Growers' Stock Company was the first farming association in which members of the directorate and supervisory council, and later stockholders too, came from all three nations. The company was based on true cooperative principles. Its members were the owners, they received an advance payment for purchased grapes, and full payment, as well as allocation of profits, were performed after selling the wine. For example in 1910, so in the first year after it was established, the profit amounted to 8,380 kronen. The Company had its own cellar, and they planned to build new cellars from the profits.

The second association of wine-growers and wine-makers was the First Herzegovinian Winemaking Cooperative established in Mostar in 1911. At that time, almost all big wine cellars and wine merchants were in Mostar and they were all against establishment of a wine-growing or wine-making cooperative in Mostar. Nevertheless, the cooperative was established and was engaged in wholesale wine trades on behalf of its members.

During the First World War, viticulture and wine-making stagnated, and work of cooperatives also came to a standstill. Although both these cooperatives were in the register until the end of the First World War, their activity was reduced to a minimum, and after the new state was formed in 1918, they discontinued their operation. However, new efforts to restore viticulture and wine-growing associations were made after the war. With the purpose of improving viticulture in the new state, the Kingdom of Yugoslavia, the main association of Yugoslav wine-growers was founded in Belgrade. For a successful operation of the association at the national level,

U Upravnom odboru Saveza bili su najpoznatiji vinari iz Mostara, Ljubuškog, Stoca i Trebinja.

Djelokrug rada saveza bio je opsežan. On podnosi predstavke i daje stručna mišljenja za donošenje ili dopune zakona koji su u interesima domaćega vinogradarstva i podrumarstva. Zadaća je Saveza unapređenje vinogradarstva i podrumarstva, sudjelovanje u reguliranju prometa vinom uz suradnju postojećih poljoprivrednih i gospodarskih društava, te saveza zemljoradničkih, odnosno seljačkih zadruga. Savez bi trebao poticati osnivanje vinogradarskih i vinarskih zadruga, a može također sazivati stručne kongrese, priređivati izložbe i vinske sajmove. No rad Saveza nije bio naročito uspješan zbog različitih interesa vinogradara i podrumara. U Čitluku je kao najvažnijem vinogradarskom području Hercegovine, 1922. godine osnovana vinogradarska zadruga, ali je djelovala samo tri godine nakon čega se ugasila jer njihov podrum nije mogao izdržati konkurenciju velikih podrumara iz Mostara.

Najpoznatija vinogradarska zadruga bila je ona osnovana u Gnojnicama 1937. godine. Osnovala ju je Povrćarsko-voćarska zadruga iz Mostara. Povrćarsko-voćarska zadruga osnovana je 1930. godine i veoma se uspješno bavila otkupom i prodajom povrća, voća i grožđa u ime svojih zadrugara. No uvidjeli su da će postići mnogo bolji poslovni rezultat ako sami prerađuju grožđe i prodaju vino. Stoga su 1935. godine osnovali vinogradarsku sekciju, kupili podrum i opremu i počeli preradu grožđa svojih zadrugara. Već za godinu dana uspjeli su za grožđe svojih vinogradara postići dvostruku cijenu od one koju su dobivali od drugih podrumara. Osim toga zadruga je nabavljala za članove repromaterijale po povoljnijim cijenama i nižim kamatama. Nakon toga je broj vinogradara toliko porastao da je vinogradarska sekcija registrirana 1937. kao samostalna vinogradarska zadruga sa sjedištem u selu Gnojnicama južno od Mostara. Zadruga je u svom podrumu proizvodila isključivo visoko kvalitetna vina Žilavku i Blatinu, dobivši brojna odličja, a izvozila ih je u Austriju, Čehoslovačku i još neke zemlje. Zadruga je imala svoj vlastiti vinograd i dva podruma ukupna kapaciteta 5.000 hl.

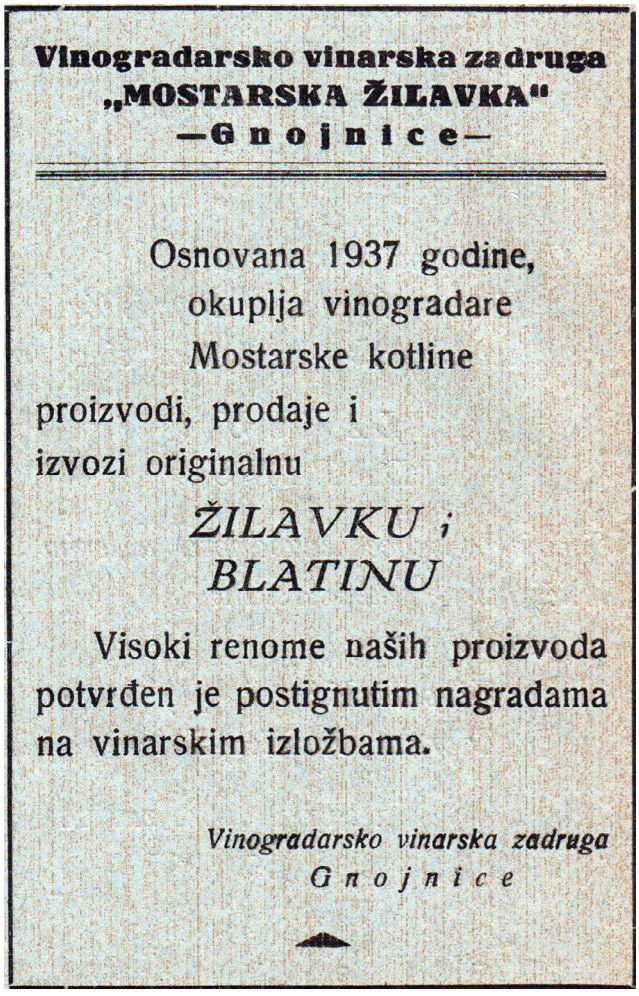
Nakon Drugoga svjetskog rata zadruga je nastavila

it was divided into regional associations. The Association of Winegrowers for Herzegovina was established in Herzegovina in the early 1921. In these first postwar years, phylloxera destroyed a considerable part of vineyards in Herzegovina, while the economic crisis in the entire country also resulted in a wine crisis. Therefore, this time wine-makers and wine merchants became actively involved in the establishment and operation of the Association. The best known wine-makers from Mostar, Ljubuski, Stolac and Trebinje were in the Managing Board of the Association.

The Association had an extensive scope of work. It submitted petitions and provided expert opinions for adoption or amendments to laws that served the interests of local viticulture and wine-making. The Association was in charge of improving viticulture and oenology, participate in wine trade control in cooperation with existing agricultural and economic companies, as well as associations of farming or peasant cooperatives. The Association was to encourage establishment of viticultural and wine-making cooperatives, and could also convene expert congresses, organize shows and wine fairs. But the work of the Association was not particularly successful because of different interests of wine-growers and wine-makers. In 1922, a wine-growing cooperative was established in Citluk as the most important wine-growing area of Herzegovina, but it operated for only three years after which it was shut down, because their cellar could not withstand the competition of major wine-makers from Mostar.

The best known wine-growing cooperative was the one that was founded in Gnojnice in 1937. It was established by Vegetable and Fruit Growing Cooperative from Mostar. The Vegetable and Fruit Growing Cooperative was founded in 1930 and was very successful in buying and selling vegetables, fruits and grapes on behalf of its members. But they realized that they would achieve much better business results if they processed grapes and sold the wine by themselves. Therefore, in 1935 they founded a wine-growing section, purchased a cellar and equipment, and began processing the grapes of their members. In as little as a year, for grapes of their growers they were able to achieve a price

rad, ali kao i sve druge kompanije u socijalističkoj Jugoslaviji registrirana je kao državno poduzeće, a samo je formalno bila vlasništvo zadrugara. No i dalje se bavila otkupom grožđa od vinogradara, proizvodnjom i prodajom vina. Po uzoru na podrume te vinogradarske zadruge, u Hercegovini je početkom pedesetih godina prošloga stoljeća osnovano još pet zadružnih podruma. No ti su podrumi bili u sastavu zemljoradničkih zadruga općeg tipa, koje su se, između ostalog, bavile vinogradarstvom, proizvodnjom i otkupom grožđa, preradom i prodajom vina. Vinogradarska zadruga u Gnojnicama je veoma uspješno poslovala sve do kraja pedesetih godina dok nije izgrađena Vinarija *Mostar*. Nakon toga zadruga prestaje sa samostalnim radom, a ni podrum u Gnojnicama više nije bio u funkciji. Isto tako izgradnjom velikih državnih vinarija u Mostaru, Čitluku, Ljubuškom, Stocu i Domanovićima krajem pedesetih i početkom šezdesetih godina, prestaju s radom svi zadružni podrumi.



Slika 70. Oglas vinogradarske zadruge Gnojnice iz 1955.
Figure 70. Advertisement of Cooperative Gnojnice, 1955

twice as high as the one they had received from other wine-makers. In addition, the association procured production materials at lower prices and lower interest rates for members. After that, the number of growers increased so much that the wine-growing section was registered in 1937 as an independent wine-growing cooperative based in the village of Gnojnice south of Mostar. In its cellar, the cooperative was producing only high quality wines Zilavka and Blatina, it received numerous awards for its wines, and exported wine to Austria, Czechoslovakia and some other countries. The cooperative had its own vineyard and two cellars with total capacity of 5,000 hl.

After the Second World War, the cooperative continued to work, but like all the other companies in socialist Yugoslavia it was registered as a state-owned company, and was only formally owned by its members. But it continued to be engaged in purchasing grapes from growers, producing and selling wine. Following the example of cellars of this wine-growing cooperative, another five cooperative cellars were established in Herzegovina in the early 1950s. But these cellars were part of agricultural cooperatives of general type, which, among other things, dealt with viticulture, production and purchase of grapes, and making and selling of wine. The wine-growing cooperative in Gnojnice was doing a very successful business until the end of the fifties when the Mostar winery was built. After that, the cooperative stopped working independently, and even the cellar in Gnojnice was no longer functioning. Similarly, as large state-owned wineries in Mostar, Citluk, Ljubuski, Stolac and Domanovici were built in late fifties and early sixties, so all cooperative cellars stopped working.

In a socialist system, as it was in the former Yugoslavia, it was not possible to establish private cooperatives, so there were no private cooperatives in viticulture and oenology either. Since they did not have enough grapes to fill capacities, large wineries would purchase grapes from agricultural cooperatives and growers. But that was a pure sales relationship. Wine-growers were given money for their grapes and then the winery did not have any obligations to them. It was only after the socialist social relations were abolished in the early nineties that conditions

U socijalističkom sustavu, kakav je bio u bivšoj Jugoslaviji, nije bilo moguće osnivanje privatnih zadruga, pa ni u vinogradarstvu i vinarstvu nije bilo privatnoga zadrugarstva. Budući da nisu imale dovoljno grožđa za popunu kapaciteta, velike su vinarije od zemljoradničkih zadruga i vinogradara otkupljivale grožđe. No to je bio čisti kupoprodajni odnos. Vinogradari su dobili novac za svoje grožđe i nakon toga vinarija nije imala nikakvih obveza prema njima. Tek nakon ukidanja socijalističkih društvenih odnosa početkom devedesetih godina stekli su se uvjeti za povezivanje vinogradara u specijalizirane udruge koje će štititi njihove interese.

Današnje stanje udruživanja vinogradara i vinara

U Federaciji Bosne i Hercegovine formirane su dvije takve udruge, **Udruga vinogradara i vinara Hercegovine** sa sjedištem u Čitluku i **Udruga vinogradara i vinara Južne Hercegovine**. Obje su neprofitne i nevladine organizacije.

Udruga vinogradara i vinara Hercegovine osnovana je 2001. godine s ciljem revitalizacije vinogradarstva i vinarstva Bosne i Hercegovine. Pored toga primarnog cilja Udruga ima i druge zadatke: poticanje razvoja rasadničarstva, udruživanje ili povezivanje s istim ili sličnim udrugama, organizacija zajedničkih nastupa prema nadležnim tijelima državne uprave u cilju zaštite hercegovačkih vina i redovite kontrole u prometu vina, predlaganje izmjena i dopuna propisa koji mogu utjecati na proizvodnju sadnoga materijala te kakvoću grožđa i plasman vina, organiziranje stručne i druge pomoći u proizvodnji grožđa i vina, poticanje znanstveno- istraživačkoga rada, organizacija zajedničkih nastupa na regionalnim i međunarodnim izložbama i sajmovima vina, razvoj marketinga grožđa i vina (publikacije, katalozi, prezentacije i sl.). Udruga svojim djelovanjem nastoji promovirati Bosnu i Hercegovinu kao vinogradarsku i vinarsku zemlja i stvaranje imidža o autohtonim hercegovačkim sortama, napose Žilavki i Blatini kao bosanskohercegovačkom brendu koji može biti ravnopravni tržišni konkurent najpoznatijim vinskim sortama u bližem i daljem okruženju. Članstvo u Udruzi je dragovoljno, a trenutačno

were met for wine-growers to join together into specialized associations that were to protect their interests.

Present level of association

In the Federation of Bosnia and Herzegovina, two of these associations were established, **the Association of Winegrowers and Winemakers of Herzegovina** based in Citluk and **the Association of Winegrowers and Winemakers of Southern Herzegovina**. Both are non-profit and non-governmental organizations.

The Association of Winegrowers and Winemakers of Herzegovina was established in 2001 with the purpose of reviving viticulture and winemaking of Bosnia and Herzegovina. In addition to this primary objective, the Association has other tasks, and these are: encouraging the development of nursery production; associating or linking with the same or similar associations; organizing joint appearances with competent state administration bodies in order to protect Herzegovina wines and regular controls in wine trades; proposing amendments to regulations that may affect production of planting materials as well as quality of grapes and wine sales; organizing professional and other assistance in the production of grapes and wine; encouraging scientific research; organizing joint presentations at regional and international wine shows and fairs; development of grape and wine marketing (publications, catalogs, presentations, etc.). Through its activities, the Association seeks to promote Bosnia and Herzegovina as a wine-growing and wine-making country and create the image of autochthonous varieties of Herzegovina, especially Zilavka and Blatina, as Bosnian and Herzegovinian brands that can rival the best known wine varieties in the market in the immediate and distant environment. Membership in the Association is voluntary and association currently has 30 members. In addition to members from Citluk where the Association is based, its members come from almost all the municipalities of the Federation of Bosnia and Herzegovina in which wine-making is one of the branches of agriculture.

The Association of Winegrowers and

broji trideset članova. Osim članova iz općine Čitluk gdje je sjedište Udruge, u njoj su i članovi iz skoro svih općina Federacije BiH u kojima je vinarstvo jedna od poljoprivrednih grana.

Udruga vinogradara i vinara Južne Hercegovine sa sjedištem u Stocu osnovana je 2007. godine. Ta udruga pokriva područje općina Stolac i Čapljina i trenutačno ima sedam članova. Među članovima udruge uglavnom su vinarije s područja te dvije općine, a također i vinogradarska zadruga *Daorson*. Zadaće i ciljevi te udruge isti su kao i Udruge vinogradara i vinara Hercegovine, a dvije udruge međusobno surađuju na svim pitanjima bitnim za vinogradarstvo i vinarstvo kako u Federaciji, tako i u državi Bosni i Hercegovini.

U Republici Srpskoj postoje tri vinogradarsko-vinarske asocijacije: Udruženje vinogradara i vinara istočne Hercegovine *Vinos* sa sjedištem u Trebinju, Udruženje vinogradara i vinara Republike Srpske sa sjedištem u Gradiški, te Udruženje vinogradara, vinara i voćara Pinot noir sa sjedištem u Prnjavoru.

Udruženje vinogradara i vinara istočne Hercegovine *Vinos* sa sjedištem u Trebinju kao nevladina i neprofitna organizacija osnovano je 2006. godine. Radi simbolike Udruženje je osnovano 14. veljače, na Dan svetoga Trifuna, zaštitnika vinogradara i vinara. Osnovna je zadaća udruženje unapređenje vinogradarstva i vinarstva toga područja Republike Srpske, a posebni su ciljevi predstavljanje vina istočne Hercegovine, širenje tržišta organiziranjem zajedničkih nastupa na sajmovima i izložbama, pomoć u istraživanju, selekciji i reprodukciji sadnog materijala, pružanje stručne i druge pomoći članstvu, njegovanje i oživljavanje turističkih i tradicionalnih običaja i svetkovina vezanih za vinogradarstvo i vinarstvo, te suradnja sa znanstvenim i stručnim institucijama i drugim udruženjima u zemlji i inozemstvu. Udruženje ima dvadeset i pet članova među kojima je petnaest registriranih vinskih podruma. Udruženje sudjeluje u organiziranju različitih vinogradarskih i vinarskih manifestacija poput *početka rezidbe vinove loze na dan svetog Trifuna, Trebinjskih dana vina* i drugih prigodnih manifestacija.

Drugo udruženje u Republici Srpskoj, **Udruženje vinogradara i vinara Republike Srpske**

Winemakers of Southern Herzegovina was established in 2007 and is based in Stolac. This association covers the area of the Stolac and Capljina municipalities and presently has seven members. Members of this association include mainly the wineries from the area of these two municipalities, but also the wine-making cooperative of Daorson. The tasks and objectives of this association are the same as ones of the Association of Winegrowers and Winemakers of Herzegovina, and the two associations cooperate with each other in all issues relevant to viticulture and oenology both in the Federation and the State of Bosnia and Herzegovina.

There are three associations in the Republic of Srpska: the Association of Winegrowers and Winemakers "Vinos" based in Trebinje, the Association of Winegrowers and Winemakers of the Republic of Srpska based in Gradiska and Association of wine-growers, wine-makers and fruit-growers Pinot Noir based in Prnjavor.

The Association of Winegrowers and Winemakers of Eastern Herzegovina "Vinos" based in Trebinje was established in 2006 as a non-governmental and non-profit organization. The Association was symbolically established on 14 February, on the day of St. Tryphon, the patron of wine-growers and wine-makers. The primary mission of the association is to enhance viticulture and winemaking of this area of the Republic of Srpska, while specific objectives are: presentation of wines of eastern Herzegovina; expansion of markets by organizing joint participation in fairs and shows; assistance in research, selection and reproduction of planting materials; providing professional and other assistance to members; nurturing and revival of tourist and traditional customs and festivals related to viticulture and oenology; and cooperation with scientific and professional institutions and other associations in the country and abroad. The association has 25 members, including 15 registered wine cellars. The Association participates in the organization of various viticultural and oenological events like the Trebinje Wine Days, the Days of New Wines and the Days of Open Cellars.

The other association in the Republic of Srpska, the **Association of Winegrowers and Winemakers of the RS** was established in 2003 in the northern

osnovano je 2003. godine u sjevernom dijelu toga entiteta, na području Banjalučke regije. Kako se u Banjalučkoj regiji posljednjih petnaestak godina vinogradarstvo sve više širi, osjećala se potreba za osnivanjem udruženja koje bi okupilo sve vinogradare i vinare s toga područja. Na tom području svake godine niču novi vinogradi i počinju se osnivati nove moderne vinarije pa je udruženje njihov zastupnik u organima vlasti, a preko udruženja zajednički lakše rješavaju mnoge probleme u proizvodnji i prodaji. Udruženje je suorganizator manifestacije *Banjalučki dani vina*, za vrijeme koje se dodjeljuju nagrade najboljim vinima s toga područja i nagrađuje najbolji vinograd. Udruženje surađuje s drugim udruženjem iz Republike Srpske, Udruženjem vinara i vinogradara istočne Hercegovine, ali isto tako i sa svim drugim asocijacijama i organima koji mu mogu pomoći na unapređenju vinogradarstva i vinarstva Banjalučke regije.

U općini Prnjavor na Ukrinskom vinogorju osnovano je **Udruženje vinogradara, vinara i voćara Pinot Noir** u cilju unapređenja voćarstva, ali isto tako vinogradarstva i vinarstva. Ukrinsko područje u prošlosti imalo je razvijeno vinogradarstvo, ali je nestalo tijekom osmanske vladavine. Osnivanjem voćarsko-vinogradarske stanice u Derventi austrougarska vlast pokušala je obnoviti vinogradarstvo, ali nije imala većeg uspjeha. Osnivanje je ovoga Udruženja mogući znak da bi se uzgoj vinove loze ponovo mogao raširiti na tom području budući da za to postoje povoljni uvjeti i potencijalne površine.

Sve navedene udruge su asocijacije vinogradara i vinara koje se zauzimaju općenito za dobrobit vinogradarstva i vinarstva u Bosni i Hercegovini i nemaju karakter ni funkciju zadruge. Prva i za sada jedina vinogradarsko-vinarska zadruga u Bosni i Hercegovini osnovana je 2010. godine u Stocu pod imenom Vinogradarsko-vinarska zadruga *Daorson*. Ime je dobila po obližnjem antičkom naselju Daorson, glavnom gradu ilirskoga plemena Daorsi koji su to područje nastanjivali prije više od 2200 godina. U iskopinama toga naselja pronađene su amfore za vino, što govori o dugoj tradiciji vinogradarstva i vinarstva na tom području. Zadrugu je osnovalo osam vinogradara, a uz pomoć nekih stranih i domaćih donacija krajem 2010. izgradili su modernu vinariju kapaciteta 600 hl. Iz vlastitih vinograda za sada

part of this entity, in the Banja Luka region. As wine-growing has been increasingly expanding in the Banja Luka region in the last fifteen years, there is awareness of the need to establish an association that would bring together all wine-growers and wine-makers from the area. New vineyards spring up and new modern wineries begin to be established in this area every year, so the association is their representative in governmental bodies, and through the association they together easier solve many problems in production and sales. The Association is a co-organizer of the event Banja Luka Wine Days, during which time the best wines from the area are granted awards and the best vineyard is rewarded. The Association cooperates with the other association from the Republic of Srpska, Association of Winemakers and Winegrowers of Eastern Herzegovina, but also with all other associations and bodies that can help it improve the viticulture and oenology of the Banja Luka region.

Association of wine-growers, wine-makers and fruit-growers Pinot Noir was established in the municipality of Prnjavor in the Ukrina wine-growing region with the aim to improve fruit-growing, but also wine-growing and winemaking. The Ukrina area had a developed wine-growing in the past, but it disappeared during the Ottoman rule. By establishing the fruit-growing and wine-growing station in Derventa, Austro-Hungarian authorities tried to renew viticulture, but did not have any significant success. Establishment of this association is a possible sign that cultivation of vines could become common in this area again, since favorable conditions and prospective areas for that exist.

All the mentioned associations are associations of wine-growers and wine-makers that are generally committed to the prosperity of viticulture and oenology in Bosnia and Herzegovina and do not have character or function of cooperatives. The first and so far the only wine-growing and wine-making cooperative in Bosnia and Herzegovina was established in 2010 in Stolac under the name of Winegrowing and Winemaking Cooperative of Daorson. It was named after the nearby ancient settlement of Daorson, the capital of the Illyrian tribe Daorsi who inhabited this area more than

popunjavaju samo trećinu kapaciteta vinarije, ali članovi zadruge planiraju povećati površine pod vinogradima, a za popunu kapaciteta otkupljivat će grožđe i od drugih vinogradara koji nisu članovi zadruge. Zadruga je osnovana na načelu dioničkoga društva. Svaki zadrugar uložio je određeni kapital i prema ulogu je suvlasnik zadruge, odnosno vinarije. Svaki zadrugar preda grožđe u vinariju i za to dobije naknadu, a po završnom računu nakon prodaje vina dobit se dijeli prema uloženom kapitalu, odnosno suvlasništvu. Zadruga i vinarija imaju samo jednoga, stalno zaposlenog koji je po zanimanju agronom i koji je ujedno direktor vinarije. Sve poslove u vinariji obavljaju sami zadrugari čime smanjuju troškove u proizvodnji vina, a to im se kasnije vraća kroz ostvarenu dobit.

Valja reći da i u Republici Srpskoj postoji jedna zadruga koja se bavi vinogradarstvom. To je **zemljoradnička zadruga Podrumi Banjalučke biskupije,** osnovana 2007. godine, a zadaća je zadruge da brine o vinogradu i vinariji Banjalučke biskupije u Mahovljanima kod Gradiške.

2200 years ago. Amphorae for wine were found in excavations of this settlement, which is indicative of a long tradition of viticulture and oenology in this area. The cooperative was founded by eight wine-growers and at the end of 2010 they built a modern winery with the capacity of 600 hl with the help of some foreign and local donations. For the time being their own vineyards fill only one third of the capacity of the winery, but members of the cooperative plan to increase the area of vineyards, and in order to fill the capacity they purchase grapes from other wine-growers who are not members of the cooperative. The cooperative was founded as a joint stock company. Each member has invested some capital and is a co-owner of the cooperative, or winery, according to his/her share. Each member hands over grapes to the winery and receives compensation for that, and upon the final account after selling the wine, the profit is divided according to invested capital, or co-ownership. The cooperative and the winery have only one permanent employee who is agronomist by profession, and who is also the manager of the winery. Members of the cooperative carry out all tasks in the winery by themselves, thereby reducing costs in the production of wine, which they later return through the profits gained.

It should be said that there is a cooperative engaged in viticulture in the Republic of Srpska too. That is the Agricultural Cooperative Banja Luka Diocese Cellars, founded in 2007. The task of the cooperative is to take care of the vineyard and winery of the Banja Luka Diocese in Mahovljani near Gradiska.

RELIGIJSKI POGLEDI NA VINOVU LOZU I VINO

Vinova loza i vino u židovstvu i kršćanstvu

Fra Andrija Nikić

Biblija ili Sveto pismo uz sve poznate atribute, od kojih je temeljni onaj da je u njoj sadržana riječ Božja, svojevrstan je dokument koji govori i o vinogradarstvu i vinarstvu, lozi i vinu. U 39 biblijskih knjiga Staroga zavjeta (od ukupno 46) i u 10 knjiga Novoga zavjeta (od 27 uvrštenih u Bibliju) riječ vino javlja se oko 235 puta, riječ vinograd 145, loza 45, grožđe 44, grozd (kao cvat koji nije nužno uvijek cvat vinove loze) 18, a vinogradar 10 puta. Iz apostolskih evanđelja (dobrih vijesti) saznajemo za Kristova čudesa, od kojih su upravo najveća u svezi s vinom. Prvo je ono kada je u Kani galilejskoj pretvorio vodu u vino (Iv 2;3,9,10, 4;46).

U Starom Zavjetu vino je znak radosti (Ps 104,15), ljekovito sredstvo, žrtveni prinos (ljevanica) i slika Izraela. U Novom zavjetu slika vinove loze (trsa) označuje Isusovo zajedništvo s učenicima (Iv 15,1-8). Isus je na Posljednjoj večeri ustanovio novi Savez u znaku vina, a u kršćanstvu, zajedno s kruhom vino je glavni žrtveni dar.

Zajedno sa žitom i uljem, vino kojim rađa *Obećana zemlja* spada u svakodnevnu hranu (Pnz 8,8; 11,14; 1 Ljet 12,41); ono ima tu osobitost da *razvedruje srce čovječje* (Ps 104,15; Suci 9,13). Ono je stoga element mesijanske gozbe, a također, i to prvenstveno, i euharistijske gozbe u kojoj vjernik crpi radost na njenu izvoru: u Kristovoj ljubavi.

Biblijska svjedočanstva o vinogradima

U Bibliji se vinogradi i vinski trs spominju često od Post 9,20 (Noa) i dalje. Vino je kao užitak

RELIGIOUS VIEWS OF GRAPEVINE AND WINE

Grapes and wine in Judaism and Christianity

Fra Andrija Nikic

With all the known attributes, of which the fundamental one is that it contains the word of God, the Bible or Holy Scriptures is the document of its kind that also deals with viticulture and winemaking, vine and wine. In 39 biblical books of the Old Testament (out of the total of 46) and in 10 books of the New Testament (of the 27 included in the Bible), the word wine appears about 235 times, the word vineyard 145, vine 45, grapes 44, bunch (as a flower that is not necessarily always the flower of vine) 18, and winegrower 10 times. From the apostolic gospels (good news) we learn about Christ's miracles, of which precisely the greatest ones are related to wine. The first one is when he turned the water into wine at Cana in Galilee (John 2:3,9,10, 4:46).

In the Old Testament, wine is a symbol of delight (Ps 104;15), remedy, sacrificial offering (libation) and the image of Israel. In the New Testament the image of vine signifies Jesus' unity with his disciples (John 15;1-8). At the Last Supper, Jesus established the new covenant marked with wine, and in Christianity, wine is the main sacrificial gift together with bread.

Together with wheat and oil, wine produced by the *Promised Land* belongs to everyday foods (Deut 8:8; 11:14; 1 Chron 12:40); and has the property that it "*gladdens human heart*" (Ps 104:15; Judges 9:13). It is therefore an element of the messianic feast, and also primarily of the Eucharistic feast, where believer draws joy on its source: in the love of Christ.



Slika 71. Jesen ili grožđe iz Obećane zemlje (N. Poussin 1594. - 1665.)
Figure 71. Autumn or grape from Promised land (N. Poussin 1594 - 1665)

(Suci 9,13; Sir 31,32), hrana (39,31), jakost (2 Sam 16,2) i lijek (Lk 10,34). Ono je Božji dar (Hoš 2,10). U obredu ima jako važnu ulogu - kao prinosnica je svakoj žrtvi, bilo paljenici ili pomirnici (Iz 29,40). Isus često upotrebljava u svojim parabolama slike iz vinogradarske kulture, tako o radnicima u vinogradu (Mt 20,1-6), o zlim vinogradarima (Mt 21,33-46), o trsu i mladicama (Iv 15,1-8). Malo kultura ovisi koliko i vinograd u isti mah od brižljiva i domišljata čovjekova rada kao i od ritma godišnjih doba. Palestina, kao vinogradarska zemlja, uči Izrael uživati u plodovima zemlje, da svim srcem prione uza zadaću što mnogo obećava, ali ga uči i da sve očekuje od Božje darežljivosti. S druge strane, vinograd, koji je tako dragocjen, ima u sebi nešto tajnovito. On vrijedi tek svojim plodom. Drvo mu je bezvrijedno (Ez 15,2-5), njegove neplodne loze služe samo za vatru (Iv 15,6), ali plod njegov donosi radost (Suci 9,13); vinograd dakle krije u sebi dublji misterij: on donosi radost čovjekovu srcu (Ps 104,15), a čovjek je vinograd čiji je plod

Biblical records on vineyards

In the Bible, vineyards and vines are mentioned frequently from Gen 9:20 (Noah) and further on. Wine is as pleasure (Judges 9:13; Sir 31,32), food (39,31), strength (2 Sam 16:2) and medicine (Luke 10:34). It is a gift of God (Hos 2:10). It has a very important role in rituals - as offering to every sacrifice, either burnt or atonement (Is 29:40). In his parables, John often uses images of the winegrowing culture, thus of workers in the vineyard (Matt 20:1-6), of evil wine growers (Matt 21:33-46), of vines and branches (John 15:1-8). Few crops depend on careful and inventive human work as well as the rhythm of the seasons at the same time as much as vineyard. Palestine, as a wine-growing country, teaches Israel how to enjoy the fruits of the soil, to cleave to the task that promises much with all its heart, but it teaches it also to expect everything from God's generosity. On the other hand, vineyard, which is so precious, has something mysterious

Bogu na radost.

Teška je nepravda kralja koji otima vinograde svojim podanicima; tu zloporabu, koju je prorekao Samuel (1 Sam 8,14 sl), počinja Ahab (1 Kr 21,1-16). No, pod dobrim kraljem svatko živi u miru, pod svojom lozom i smokvom (1 Kr 5,5; 1 Mak 14,12). Taj će se ideal ostvariti u mesijanska vremena (Mih 4,4; Zah 3,10); tada će loza biti plodna (Am 9,14; Zah 8,12). Vinograd, slika Mudrosti (Sir 24,17), slika plodne zaručnice pravednikove (Ps 128,3), u svom je pupanju simbol nade zaručnika koji u *Pjesmi nad pjesmama* pjevaju o tajni ljubavi (Pj 6,11; 7,13; 2,13.15; usp. 1,14).

Doći će dan kad će se vinograd rascvasti pod budnim Božjim okom (Iz 27,2 sl.). Zato Izrael zaziva vjernu Božju ljubav: da bi on spasio onaj vinograd što ga je iz Egipta presadio u svoju zemlju u koji je trebao predati pustošenju i ognju! On će mu odsad biti vjeran (Ps 80,9-17). No, neće Izrael nipošto održati to obećanje. Posežući za Izaijinom prispodobom, Isus ovako sažima povijest izabranog naroda: Bog nije prestajao od svoga vinograda očekivati plodove; ali umjesto da sluša proroke što ih je on izaslao, vinogradari su ih zlostavljali (Mk 12, 1-5). Kao vrhunac ljubavi, on im sada šalje svoga ljubljenoga Sina (12,6), a kao odgovor, glavari naroda počinit će vrhunsku nevjeru ubivši Sina koji je baštinik vinograda. Stoga će krivci biti kažnjeni, a smrt Sina otvorit će novo razdoblje nauma Božjega: vinograd će biti povjeren vjernim vinogradarima i najzad će uroditi plodom (12,7 sl; Mt 21,41 sl).

Starozavjetni savjeti

Najčešće se riječ vino spominje u doslovnom značenju. To je slučaj kada se o vinu govori u obredu žrtvovanja (Izl 29;40, Lev 23;12, Br 15;5,7,10, 28;7,14, 2. Sam 16;1 i dr.), ili pak kao piću koje se daruje i s kojim se časti gosta (1. Sam 1;24, 10;3, 16;20, 25;18,). Vino se opisuje kao piće za okrjepu umornih (2. Sam 16;2, 1. Ljet 12;41), ali i kao uzročnik pijanstva (Post i dr.). Uz naputak kada se valja suzdržavati od vina (Lev 10;9, Br 6;3, Suci 13;4,7,14) ili kada ga je dopušteno piti (Br 6;20), riječ vino se spominje i kada se govori o brizi za njegovo čuvanje (1. Ljet 9;29) i u mnogim drugim primjerima, npr.

in itself. It is worth only by its fruit. Its tree is worthless (Ezek 15:2-5), its fruitless branches are used only for fire (John 15:6), but its fruit brings joy (Judges 9:13); therefore vineyard hides in itself a deeper mystery: it makes the human heart glad (Ps 104:15), and man is a vineyard whose fruit is to the joy of God.

Injustice of a king who takes vineyards away from his subjects is serious; this abuse, which was predicted by Samuel (1 Sam 8:14), was committed by Ahab (1 Kings 21:1-16). However, under a good king everyone lives in peace under his own vine and fig tree (1 Kings 4:25, 1 Macc 14:12). This ideal will be realized in the Messianic time (Mic 4:4 Zech 3:10); then vines will be fruitful (Am 9:14; Zech 8:12). Vineyard, the image of Wisdom (Sir 24:17), the image of the fertile bride of the righteous (Ps 128:3), in its budding is a symbol of hope of the engaged, who sing about the secret of love in the *Song of Songs* (Song 6:11, 7:13, 2:13,15, cf. 1:14).

The day will come when vineyard will blossom under the watchful eye of God (Is 27:2). Therefore Israel invokes God's faithful love, in order that he would save the vineyard that he transplanted from Egypt to his country which he should surrender to desolation and fire! It will be faithful to him from now on (Ps 80:9-17). But Israel will not keep that promise in any way. Reaching for Isaiah's parable, Jesus sums up the history of the chosen people like this: God did not cease to expect the fruits of his vineyard; but instead of listening to the prophets which he sent, tenants abused them (Mark 12:1-5). As the peak of love, he now sends his beloved Son to them (12:6), and in response, chiefs of the people will commit the ultimate infidelity by killing the Son who is the heir of the vineyard. Therefore, the perpetrators will be punished, and the death of the Son will open a new era of God's plan: the vineyard will be entrusted to faithful tenants and will eventually bear fruit (12:7; Matt 21:41).

References in the Old Testament

The word wine is mentioned most frequently in the literal sense. That is the case when talking about wine in a ritual of sacrifice (Ex 29:40; Lev 23:13; Num 15:5,7,10; 28:7,14, 2 Sam 16:1 etc.),

prilikom očeva blagoslova sinu (Post 27;28) uz molitvu da Bog bude milostiv i da pošalje rosu s neba od koje ovisi obilje kruha, vina i ulja. U svim navedenim i drugim primjerima Biblija odvraća ljude od zlouporabe vina, jer pijanstvo isključuje iz Kraljevstva Božjega… U Jotamovoj basni, priči s moralnom poukom (razne biljke među kojima i) loza postaje simbolom ljudskih vrlina. Taj dio što se odnosi na lozu glasi: "Tad rekoše stabla lozi: Budi nam kraljem! Odgovori im loza: Zar da se odreknem vina što veseli bogove i ljude da bih vladala nad drugim drvećem"(9;13).

Novozavjetni savjeti

U Novome zavjetu vino je simbol mesijanskih vremena i *krvi što ju je Gospodin prolio*; slika trsa simbolizira zajedništvo Isusa s njegovim učenicima, a i vinograd se pojavljuje u mnoštvu prispodoba; bezbožnik je slika neplodna trsa i on mora piti vino gnjeva i suda Božjega; pravednik je dionik saveza što ga je Isus tijekom Posljednje večere ustanovio pod znakom kruha i vina.

Izdvojene savjete upotpunjuje činjenica koju sam Isus donosi. Isus je vinograd, a mi loze, kao što je on Tijelo, a mi udovi. Istinski vinograd jest on, ali i njegova Crkva, čiji su članovi u zajedništvu s njime. Bez tog zajedništva ne možemo ništa učiniti: samo Isus, kao istinski trs, može donositi plod koji proslavlja vinogradara, njegova Oca. Bez zajedništva s njime mi smo loze otkinute od trsa, bez soka, jalove, dobre za vatru (Iv 15,4 sl). Ljubav Oca i Sina zove sve ljude u to zajedništvo; to je nezaslužen poziv, jer onaj koji odabire one što postaju njegove loze, njegovi učenici, jest Isus, a ne izabiru oni njega (15,16). Tim zajedništvom čovjek postaje lozom istinskoga trsa.

Vino u životu Židova

Židovska predaja pripisuje Noi pronalazak uzgajanja vinove loze, a potom prikazuje kako su ga iznenadili učinci vina (Post 9,20 sl); time ona naglašava istodobno i dobrotvornost i opasnost vina. Kao znak blagodati (Post 49,11 sl; Izr 3,10), vino je dragocjeno dobro koje život čini ugodnim (Sir 32,6; 40,20), samo ako se uživa trijezno.

U Starom zavjetu Izrael je oslikan kao trs kojega

or as a drink that is given as a gift or with which one treats a guest (1 Sam 1:24, 10:3, 16:20, 25:18). Wine is described as a drink for refreshment of the tired (2 Sam 16:2, 1 Chron 12:40), but also as a cause of drunkenness (Gen etc.). With the instruction when one should abstain from wine (Lev 10:9; Num 6:3; Judges 13:4,7,14) or when it is allowed to drink (Num 6:20), the word wine is also mentioned when referring to care for its safekeeping (1 Chron 9:29) and in many other examples, e.g. when father blesses his son (Gen 27:28) with a prayer to God to be merciful and send the dew of heaven on which abundance of bread, wine and oil depend. In all these and other examples, the Bible discourages people from misusing wine, because drunkenness excludes from the Kingdom of God... In Jotham's fable, a story with a moral, (various plants including) vine become symbols of human virtues. The part concerning the vine reads: "Then the trees said to the vine, You come and be king over us! But the vine replied to them: Should I stop providing my wine that makes gods and humans happy, so that I can go to sway over the trees?"(9:13).

References in the New Testament

In the New Testament wine is a symbol of the Messianic time, and "the blood shed by the Lord"; image of the vine symbolizes the unity of Jesus with his disciples, and vineyard appears in a variety of parables; ungodly man is a picture of a fruitless vine, and he must drink the wine of the wrath and ordeal; righteous man is a participant in the covenant that Jesus established during the Last Supper under the sign of bread and wine.

The selected references are supplemented by the fact brought by Jesus himself. Jesus is the vine, and we are the branches, as he is the body, and we are the limbs. He is a true vine, but so is his Church, whose members are in communion with him. Without this communion we can not do anything: only Jesus, as the true vine, can bear fruit that celebrates the grower, his Father. Without the communion with him, we are branches broken off the vine, without sap, fruitless, good for fire (John 15:4). Love of Father and Son calls all the people into that communion; that is an undeserved invitation, because one who chooses



Slika 72. Pijani Noa (B.S. Beham, 1500. - 1550.)
Figure 72. Drunk Noah (B.S. Beham, 1500 - 1550)

je Bog izveo iz Egipta i zasadio na novoj zemlji, ali je često ostajao bez roda koji je Bog očekivao. Isus je pravi trs koji ispunja Božji naum tamo gdje je Izrael zakazao stvara novi Izrael ('loze' su oni koji vjeruju u njega) Svaka loza izbija naravno iz trsa. One loze koje su donijele rod režu se na 3-6 cm od trsa. One tako 'ostaju' na njemu tijekom većeg dijela godine, da opet naglo izrastu kako bi ponovno rodile. One, pak, loze koje nisu donijele roda sijeku se u korijenu i bacaju u oganj..

Čudo u Kani

Prisjetimo se kako je Isus prvo čudo učinio na svadbi u Kani Galilejskoj. Seoska vjenčanja bila su važan društveni događaj i obično su trajala nekoliko dana. Ostati bez vina ili hrane na svadbi značilo je društvenu sramotu koja bi pratila mladence cijeloga života.

Isus odabire svadbu, važan obiteljski događaj i životni trenutak, za mjesto na kojem će učiniti prvo čudo i javno započeti sa svojim djelovanjem. Osim toga, svadba ima i simboličku konotaciju jer je slika budućeg slavlja i sreće kada će Bog obnoviti svoje zajedništvo s ljudima (Mt 22,1-14; Otk 19,7-9). Pretvaranje vode u vino je prvo od sedam čuda opisanih u Evanđelju po Ivanu.

those that become his branches, his disciples, is Jesus, and they do not choose him (15:16). By that communion, man becomes a branch of a true vine.

Wine in Jewish life

Jewish tradition ascribes the invention of winegrowing to Noah, and then shows that it was surprised by the effects of wine (Gen. 9:20); thus it highlights both the beneficence and danger of wine at the same time. As a sign of blessings (Gen 49:11; Prov 3:10), wine is a precious good that makes life pleasant (Sir 32:6, 40:20), only if enjoyed sober.

In the Old Testament, Israel is depicted as the vine which God has taken out of Egypt and planted in a new land, but which was often left without fruit that God had expected. Jesus is the true vine that fulfills God's plan where Israel failed, and creates a new Israel ('branches' are those who believe in him). Every branch emerges naturally from the vine. The branches that have borne fruit are pruned at 3-6 cm from the vine. Thus they 'stay' on it during most of the year in order to grow rapidly again to bear fruit again. However, those branches that have not brought fruit are cut in the roots and thrown into fire.

Vino u bogoštovnom životu

Budući da je vino Božji dar, kao i svi plodovi zemlje, ono dobiva svoje mjesto u žrtvama. Vino je nadalje sastavni dio prvina što pripadaju svećenicima (Pnz 18,4; Br 18,12; 2 Ljet 31,5). Najzad, ono će dobiti svoje mjesto u žrtvi Novoga zavjeta, koji će dokrajčiti te obrede (Ez 44,21 sl; Lev 10,9 sl). Uzdržavanje od vina može biti i podsjećaj na vrijeme kad je Izrael u pustinji bio lišen vina (usp. Am 2, 12). Tako je Samson već prije svog rođenja bio posvećen po Božjoj volji (Suci 13,4 sl); slično je bilo sa Samuelom (1 Sam 1,11) i Ivanom Krstiteljem (Lk 1,15). Vjernici su često bili pozivani da se odreknu vina kako bi izbjegli svaku opasnost sramoćenja s poganstvom: to nam svjedoči židovstvo poslije izgnanstva (Dn 1,8). Pobuda za lišavanja koja su se nametala nekim kršćanima (1 Tim 5,23) najvjerojatnije je bilo nastojanje oko asketizma; samo, - podsjeća Pavao - tim asketizmom može ravnati razboritost i ljubav (Rim 14,21).

Nešto ljepše Isus nije mogao učiniti nego okupiti svoje učenike za obiteljskim stolom na Posljednjoj večeri. U kućnoj blagovaonici, slaveći najveći blagdan svoje vjere, blagovanje pashalne večere, sjedeći za stolom, uz janje i zelje, kruh i vino, pjevajući psalme i čitajući riječi Svetoga pisma, razmatrali su djela spasenja koja je dobri Bog učinio kada je izveo svoj narod iz ropstva u Obećanu zemlju. Potom je u blagdanskom ozračju, Učitelj ustao, i kao domaćin, obratio se svojim učenicima. Ustajanjem, Predsjedatelj stola, u ovoj svetoj noći, najavio je novo jelo i novo piće. Njegovo ustajanje u očima učenika označilo je zalazak prošlosti i noćne strahove, jer drugoga dana osvanut će sunce pomrčine koje će učenike sablazniti u tami njihove sigurnosti i razočarati u vjeri njihove postojanosti. Da ne smalaksate, kao da im reče, u sljedeća tri gladna dana i tri žedne noći, večeras ćete blagovati kruh moga Tijela i piti vino moje Krvi. Ovo je Isusova posljednja pashalna večera sa svojim učenicima. Ovo je njihova prva euharistijska gozba sa svojim Učiteljem. Posljednja pasha i prva euharistija, u ovoj svetoj noći, ujediniše se preko njegove oporuke, kad im reče: Ovo činite meni na uspomenu.

Miracle at Cana

Let us remember that Jesus performed His first miracle on the wedding at Cana in Galilee. Village weddings were an important social event and usually lasted several days. To run out of wine or food at a wedding would mean a social disgrace that would follow the newlyweds throughout their lifetime.

Jesus chooses a wedding, an important family event and moment in life, as the place where he will perform his first miracle and publicly begin his work. In addition, the wedding has a symbolic connotation because it is a picture of the future celebration and joy when God will renew his communion with people (Matt 22:1-14; Rev 19:7-9). Turning water into wine is the first of the seven wonders described in the Gospel of John.

Wine in worshiping life

Since wine is a gift from God, like all the fruits of the soil, it gets its place in sacrifices. Furthermore, wine is an integral part of the first fruits that belong to priests (Deut 18:4; Num 18:12; 2 Chron 31:5). Eventually, it will get its place in the sacrifice of the New Testament, which will put an end to these rituals (Ezek 44:21; Lev 10:9). Abstinence from wine can also be remembrance of the time when Israel was deprived of wine in the desert (cf. Am 2:12). So Samson was dedicated to the will of God even before his birth (Judges 13:4); it was similar with Samuel (1 Sam 1:11) and John the Baptist (Luke 1:15). Believers were often called to renounce wine in order to avoid any risk of disgrace with paganism: this is testified by Judaism after the exile (Dan 1:8). Motives for deprivation that were imposed on some Christians (1 Tim 5:23) were most likely the pursuit of asceticism; it is only wisdom and love - Paul reminds us - that can direct that asceticism (Rom 14:21).

Jesus could not do anything more beautiful but to gather his disciples at the family table at the Last Supper. In the home dining room, celebrating the greatest holiday of their faith, having the Passover dinner, sitting at the table with lamb and cabbage, bread and wine, singing psalms and reading the words of the Holy Scripture, they considered the acts of salvation that the

Simbolizam vina

S obzirom na ekonomsku važnost vinograda, vino je bilo simbol Božjih blagoslova. Ulje, žito i vino simbolizirali su materijalno blagostanje. S religioznoga gledišta simbolizam se vina smješta u eshatološki kontekst.

a) Da bi najavio velike kazne svom narodu koji ga vrijeđa, Bog u Starom zavjetu govori o uskraćivanju vina (Am 5,11; Mih 6,15; Sef 1,13; Pnz 28,39). Jedino vino za piće jest tada vino Božje srdžbe, opojna čaša (Iz 51,17). I obratno: sreća što ju je Bog obećao svojim vjernima često je izražena u obliku velikog obilja vina, kako se to vidi u proročanstvima utjehe (Am 9,14; Hoš 2,24; Jr 31,12; Iz 25,6; J1 2,19; Zah 9,17).

b) U Novom zavjetu *novo vino* jest simbol mesijanskih vremena. Isus, naime, izjavljuje kako novi Savez, uspostavljen u njegovoj osobi, jest novo vino od koga pucaju stare mješine (Mk 2,22//). Ista misao proizlazi iz Ivanova izvještaja o čudu u Kani: svadbeno vino, to dobro vino na koje su čekali *do sada*, jest dar Kristove ljubavi, znak radosti koja je ostvarena Mesijinim dolaskom (Iv 2,10; usp. 4,23; 5,25). Izraz *novo vino* susreće se najzad i u Mt 26,29 da se dočara eshatološka gozba što ju je Isus pripremio svojim vjernima u kraljevstvu Očevu. Spominjanje vina nije tek puki simbol; na nj navodi izvještaj o ustanovi euharistije. Prije no što bude pio novo vino u kraljevstvu Očevu, kršćanin će se za svojih dana napajati vinom koje je postalo krvlju što ju je Gospodin prolio (usp. 1 Kor 10,16). Uživanje vina nije, dakle, za kršćanina samo razlog zahvaljivanja (Kol 3,17) već i prigoda da se podsjeti na žrtvu koja je izvor spasenja i vječne radosti (1 Kor 11,25).

Valja na kraju reći da uzvišenost vina u Bibliji posebno dolazi do izražaja kod čuda u Kani (Iv 2,1-11), te kod slavlja Posljednje večere i upotrebi u euharistiji (Mk 14, 22-25). U Isusovim rukama i na oltaru vino je očiti znak da čovjek ima pravo ne samo na rad nego i na radost; ne samo na radno nego i na slobodno vrijeme. Vino je tu znak da se kršćanin mora zauzimati za društvenost, umjetnost, razonodu, za sve što život čini ljepšim, ugodnijim, plemenitijim.

good Lord did when he brought his people out of slavery to the Promised Land. Then, in the holiday atmosphere, Teacher stood up, and as the host, addressed to his disciples. Rising, the Chairman of the table announced a new dish and a new drink in this holy night. In the eyes of disciples, his rising marked the sunset of the past and night fears, because on the next day the darkness of the sun will appear that will shock the disciples in the darkness of their certainty and disappoint them in the faith of their persistence. In order that you do not weaken, as if he told them, in the next three hungry days and three thirsty nights, tonight you will eat the bread of my Body and drink the wine of my Blood. This is Jesus' last Passover dinner with his disciples. This is their first Eucharist feast with their Teacher. The last Passover and the first Eucharist, in this holy night, were united through his will, when he said to them: Do this in remembrance of me.

The symbolism of wine

Given the economic importance vineyards, wine was a symbol of God's blessings. Oil, grain and wine symbolize the material prosperity. From a religious point of view, the symbolism of wine is placed in an eschatological context.

a) To announce big punishment to his people who offend him, in the Old Testament God talks about the denial of wine (Am 5:11; Mic 6:15; Zeph 1:13; Deut 28:39). The only wine for drinking is then the wine of God's wrath, of the heady moment (Is 51:17). And vice versa: happiness that God promised to his faithful is often expressed in the form of a great abundance of wine, as can be seen in the prophecies of consolation (Am 9:14; Hos 2:22; Jer 31:12; Is 25,6; Joel 2:19; Zech 9:17).

b) In the New Testament the "new wine" is a symbol of the Messianic time. Namely, Jesus states that the new covenant, established in his person, is the new wine of which old wineskins burst (Mark 2:22). The same thought comes from John's report on the miracle at Cana: the wedding wine, the good wine that they were waiting for "until now," is the gift of Christ's love, a sign of joy that was realized by Messiah's coming (John 2:10; cf. 4:23; 5:25). The term "new wine" is finally encountered in Matt 26:29 to depict the

Kratice:

Stari zavjet: Knjiga Postanka (Post), Knjiga Izlaska (Izl), Levitski zakonik (Lev), Knjiga Brojeva (Br), Ponovljeni zakon (Pnz), Knjiga o Sucima (Suci), Knjiga o Samuelu (1. Sam), Knjiga Ljetopisa (Ljet) Ezra (Ezr), Knjiga o Makabejcima (1. Mak), Psalmi (Ps), Mudre izreke (Izr), Pjesma nad pjesmama (Pj), Knjiga Sirahova (Sir), Izaija (Iz),Jeremija (Jr), Ezekiel (Ez), Daniel (Dn), Hošea (Hoš), Amos (Am), Mihej(Mih), Sefanija (Sef), Zaharija (Zah);

Novi zavjet: Evanđelje po Mateju (Mt), Evanđelje po Marku (Mk),Evanđelje po Luki (Lk), Evanđelje po Ivanu (Iv), Poslanica Rimljanima (Rim), Prva poslanica Korinćanima (1. Kor), Druga poslanica Korinćanima (2. Kor), Poslanica Kološanima (Kol), i Otkrivenje (Otk).

Vinova loza i vino u islamu

Adnan ef. Jakirović

Konzumiranje alkohola u islamu je zabranjeno ili haram. Pripadnicima Islama nije ni na koji način dozvoljena konzumacija alkohohola niti se smije jesti hrana u kojoj ima alkohola, ne smiju nositi parfeme koji sadrže alkoholne sastojke i moraju se kloniti svih oblika opojnih supstanci. Takvo suzdržavanje je Allahova naredba. Zbog čega je alkohol "haram" pa ga muslimanski vjernici ne smiju konzumirati? Alkohol zamagljuje um. Muslimanska vjera temeljena je na razumu, racionalnom razmišljanju i pravilnoj prosudbi. Sve ono što može ugroziti ovakvo ponašanje je zabranjeno. Osim toga alkohol daje lošu poruku djeci, čini ljude zaboravnima i na koncu alkohol vodi u kriminal.

Zabrana alkohola nije došla odjednom, već u fazama.

Pitaju te o vinu i kocki. Reci: "Oni donose veliku štetu, a i neku korist ljudima, samo je šteta od njih veća od koristi." I pitaju te koliko da udjeljuju. Reci: "Višak!" Eto, tako vam Allah objašnjava propise da biste razumjeli! (El-Bekare, 219)

Ovaj ajet govori da je šteta od vina i kocke veća od koristi, te da je njihovo odbacivanje preče od njihova korištenja. Ovaj ajet još decidno ne

eschatological feast that Jesus prepared to his faithful in the kingdom of the Father. Before drinking the new wine in the kingdom of the Father, during his days the Christian will drink the wine that has become the blood shed by the Lord (cf. 1 Cor 10:16). So, for a Christian enjoying wine is not only the reason for giving thanks (Col 3:17), but also an opportunity to remember the sacrifice that is the source of salvation and eternal joy (1 Cor 11:25).

Eventually, it is noteworthy that the sublimity of wine in the Bible becomes particularly prominent in the miracle at Cana (John 2:1-11), and in celebration of the Last Supper and the use in the Eucharist (Mark 14:22-25). In Jesus' hands and on the altar, wine is an obvious sign that a person has the right not only of work but also of joy; not only of working time but also of leisure time. Here, wine is the sign that the Christian must support sociability, arts, entertainment, everything that makes life more beautiful, more pleasant, more noble.

Old Testament: Genesis (Gen), Exodus (Ex), Leviticus (Lev), Numbers (Num), Deuteronomy (Deut), Judges (Judges), Samuel (1 Sam), Chronicles (Chron), Ezra (Ezr), the Book of Maccabees (1 Macc), the Psalms (Ps), Proverbs (Pr), the Song of Songs (Song), the Book of Sirach (Sir), Isaiah (Is), Jeremiah (Jer), Ezekiel (Ezek), Daniel (Dan), Hosea (Hos), Amos (Am), Micah (Mic), Zephaniah (Zeph), Zechariah (Zech);

New Testament: the Gospel of Matthew (Matt), the Gospel of Mark (Mark), the Gospel of Luke (Luke), the Gospel of John (John), Epistle to the Romans (Rom), First Epistle to Corinthians (1 Cor), Second Epistle to Corinthians (2 Cor), Epistle to Colossians (Col), and Revelation (Rev).

Grapevines and wine in Islam

Adnan ef. Jakirovic

Consumption of alcohol in Islam is forbidden or haram. Members of Islam are not allowed to consume alcohol in any way, may not eat food in which there is alcohol, they are not allowed to wear perfumes containing alcoholic ingredients and must stay away from all forms of intoxicating

zabranjuje alkohol ali priprema teren za to.

Zatim je u narednoj fazi zabranjeno obavljanje namaza u pijanom stanju:

O vjernici nikako pijani namaz ne obavljajte, sve dok ne budete znali šta izgovarate! (En-Nisa', 43)

Potom dolazi konačna faza u zabrani alkohola, nakon čega nije bilo nikakvih dilema i rasprava. O konačnoj zabrani govore sljedeći ajeti:

O vjernici, vino, kocka, kumiri i strelice za gatanje su odvratne stvari i šejtanovo djelo; zato se toga klonite da biste postigli što želite. (El-Ma'ide, 90)

Nakon poziva vjernicima i direktnog obraćanja njima, što zahtijeva punu pažnju u odnosu na ono šta se želi kazati, u citiranom ajetu na prvom mjestu dolazi zabrana alkohola, a potom i zabrana kocke, kumira i strelica za gatanje. Sve četiri stvari su nazvane jednim imenom, a to je *ridžs* (odvratna stvar) i to ne bilo koji *ridžs*, nego onaj koji spada u šejtanska djela. Allah, dž.š., Kur'anom od ljudi traži da se prođu tih grijeha, kako bi bili spašeni:

Šejtan želi da pomoću vina i kocke unese među vas neprijateljstvo i mržnju i da vas od sjećanja na Allaha i od obavljanja namaza odvrati. Pa hoćete li se okaniti? (El-Ma'ide, 91)

Muhammed, s.a., u hadisu naređuje bičevanje onoga ko pije alkohol, tri puta zaredom, a ako ponovi četvrti put, naređuje njegovo ubijanje: Prenosi Ibn-Omer, r.a., da je Poslanik, s.a., rekao: "*Ko bude pio alkohol, izbičujte ga. Ako to ponovo učini, opet ga izbičujte. Pa ako opet bude pio izbičujte ga. Ako poslije toga ponovo bude pio, ubijte ga*!" (*Nesâ'i*)

„*Zar je onaj koji ima jasnu predstavu o Gospodaru svome kao onaj kojem se lijepim čine ružna djela njegova i koji za strastima svojim povodi? Primjer Dženneta, koji je obećan onima koji se Allaha boje jeste: u njemu će rijeke od vode neustajale i rijeke od mlijeka nepromijenjenog okusa, i rijeke od vina, prijatno onima koji piju i rijeke od meda procijeđenog, i gdje ima voća svakovrsnog i oprosta od Gospodara njihova, zar je to isto što i patnja koja čeka one koji će u vatri vječno boraviti ,koji će se uzavrelom vodom pojiti, koja će im crijeva kidati*"(Muhamed, 14 i 15).

Allah Uzvišeni veli: **„***Zar je onaj koji ima jasnu*

substances. Such restraint is the order of Allah. Why is alcohol "haram" so Muslim believers are not allowed to consume it? The Muslim religion is based on sense, rational thinking and proper judgment. Anything that may jeopardize this behavior is prohibited. Besides alcohol gives a bad message to children, makes people forgetful and finally alcohol leads to crime.

Prohibition of alcohol did not come at once, but in stages.

They ask you about wine and gambling. Say: "In them is a great sin, and some benefit for people, but the sin of them is greater than their benefit." And they ask you what they should spend. Say: "The excess!" This is how Allah makes rules clear to you so that you can reflect upon! (Al-Baqarah, 219)

This ayat says that the sin of wine and gambling is greater than their benefit, and that their rejection is more important than their use. This ayat does not definitely forbid alcohol yet but prepares the ground for it.

Then in the next phase it is forbidden to perform prayer in a drunken state:

Oh believers, do not approach prayer while you are in a drunken state until you know what you are saying! (An-Nisa', 43)

Then comes the final phase in prohibition of alcohol, after which there were no dilemmas and debates of any kind. The following ayats speak about the final prohibition:

Oh believers, wine, gambling, idols and divining arrows are abominations and satan›s work; therefore, avoid them, in order that you achieve what you wish. (Al-Ma'idah, 90)

After calling the believers and addressing them directly, which requires full attention in terms of what is wanted to be said, the prohibition of alcohol comes to the first place in the quoted ayat, and then prohibition of gambling, idols and arrows for divination. All of the four things are called one name, which is *rijs* (abomination) and not any *rijs*, but the one that belongs to satanic acts. By Koran, Allah Jalla Shanuhu requires people to give up those sins in order to be saved:

Using wine and gambling, Satan wants to bring enmity and hatred between you and turn you away

*predstavu o Gospodaru svome***“** tj. koji je potpuno uvjeren o Allahu i Njegovoj vjeri:“*.. kao onaj kojem se lijepim čine ružna djela njegova i koji za strastima svojim povodi?..***“** tj. nisu oni jednaki. Kao što kaže Uzvišeni: „*Zar je onaj koji zna da je istina ono što ti se objavljuje od Gospodara tvoga, kao onaj ko je slijep***“/13:19/** zatim Uzvišeni veli : **„..***Primjer Dženneta, koji je obećan onima koji se Allaha boje jeste***..“** ,tj opis je njegov *„..u njemu će rijeke od vode neustajale..“*,tj. vode koja ne mijenja okus i koja se ne može zamutiti „*.. i rijeke od mlijeka nepromijenjenog okusa..***“** tj**.** mlijeko vrhunske bjeline i kvaliteta *„...i rijeke od vina , prijatno onima koji piju***..“** tj okus njihov nije ružan niti im je miris ružan niti opija kao što je to kod ovozemaljskog vina, već mu je boja lijepa predivnog je okusa ,prijatnog mirisa i za organizam koristan*“.. i rijeke od meda procijeđenog***..“ ,** tj. čistog meda ,najljepše boje ,okusa i mirisa.

Rekao je Allahov Poslanik Muhammed a.s :“*u dženetu postoje mliječna jezera, jezera vode jezera meda i jezera vina iz kojih stalno ističu rijeke“.*

Iako je vino zabranjeno, uzgoj vinove loze i proizvodnja grožđa nisu, pa se čak i propagiraju. Neke izrazito islamske zemlje su veliki proizvođači grožđa. Primjerice Turska je šesta u svijetu, Iran deveti, a Egipat na 13. mjestu po proizvodnji grožđa u svijetu. No proizvedeno grožđe koristi se uglavnom za nealkoholne namjene, stolno grožđe, grožđice, sokove. Ipak neke islamske zemlje proizvode značajne količine vina poput Alžira koji je 2011. proizveo 47.500 tona, višestruko više nego Bosna i Hercegovina.

Vinova loza i grožđe spominju se u Kur›anu više puta. Od ukupno 114 sura[1] vinova loza i grožđe spominju se u devet sura u različitom kontekstu. Spomenut ćemo neke od njih:

Sura Abese, ajeti 25 – 28:

(25)“ *Mi obilno kišu prolivamo,*

(26) *zatim zemlju pukotinama rasijecamo*,

(27) *i činimo da iz nje žito izrasta*

from the remembrance of Allah and from prayers. So will you desist? (Al-Ma’idah, 91)

In the hadith, Mohammad orders whipping of the person who drinks alcohol three times in a row, and if repeated for the fourth time, orders his killing: Ibn-Umar conveys that the Prophet said: “*Who drinks alcohol, whip him. If he does that again, whip him again. And if he drinks again, whip him. If he drinks after that, kill him*!” (*Nesâ’i*)

„So is he who has a clear perception of his Lord like him to whom his bad acts seem attractive and who follows his own desires? The example of Paradise, which is promised to those who fear Allah is: in it are rivers of water unaltered, rivers of milk the taste of which never changes, rivers of wine pleasant to those who drink, and rivers of purified honey, and in which there are all kinds of fruits and forgiveness from their Lord - is that the same like the suffering that awaits those who will abide eternally in the Fire and will be given to drink boiling water that will sever their intestines?“(Mohammad, 14 and 15).

Allah the Almighty says: **„***Is he who has a clear perception of his Lord***“** i.e. who is fully confident about Allah and His religion:“*.. like him to whom his bad acts seem attractive and who follows his own desires?.“* i.e. they are not equal. As the Almighty says: „*Is he who knows that what has been revealed to you by your Lord is the truth like one who is blind“***/13:19/** then the Almighty says: *„..The example of Paradise, which is promised to those who fear Allah is***..“** , i.e. its description is *„...in it are rivers of water unaltered..“*, i.e. water that never changes taste and that can never become turbid „*.. and rivers of milk the taste of which never changes..“* i.e. the milk of superb whiteness and quality *„...and rivers of wine pleasant to those who drink***..“** i.e. neither their taste nor their smell are bad and it does not intoxicate like this-worldly wine, but its color is beautiful and has a beautiful taste, pleasant fragrance and is beneficial to the organism*“.. and rivers of purified honey***..“ ,** i.e. pure honey of the most beautiful color, taste and smell.

Muhammad a.s. the Prophet of Allah said: “*In the Paradise there are milk lakes, water lakes, honey lakes and wine lakes from which rivers constantly*

1 Sura je poglavlje u Kur’anu, kojih ima 114, a svako je podijeljeno na ajete – stihove kojih ima ukupno 6.236. Muslimani vjeruju da je svaki stih u Kur’anu Božja riječ.

(28) *i grožđe i povrće*“

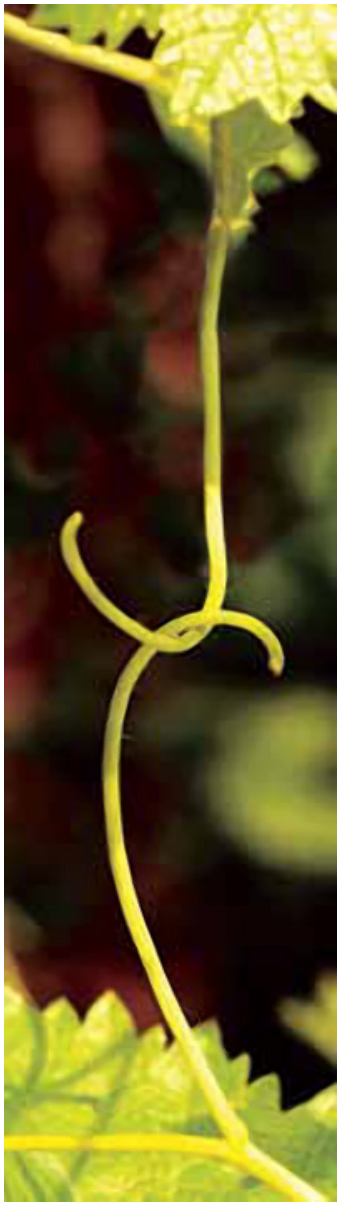
Sura El-Bekare, ajet 266;

„*Kome bi od vas bilo drago da posjeduje bašču punu palmi i vinove loze kroz koju teku rijeke i u kojoj ima svakojakih plodova*“…

Sura Nahl, ajet 67;

„*A od plodova palmi i loze pripremate piće i hranu prijatnu. To je, doista, dokaz onima koji pameti imaju*“.

U islamskom svijetu veoma mnogo se proizvodi grožđica. Po jednoj priči kada su Allahovom Poslaniku s.a. date grožđice, rekao je: “*Jedite, divna li su hrana grožđice, otklanjaju umor, smiruju srdžbu, jačaju živce i uljepšavaju dah, odstranjuju sluz i pročišćuju*



flow“.

Although wine is forbidden, cultivation of vines and production of grapes are not, so they are even encouraged. Some distinctly Islamic countries are major producers of grapes. For example, Turkey is the sixth, Iran is the ninth and Egypt is the 13th largest producer of grapes in the world. But the produced grapes are mainly used for non-alcoholic purposes, table grapes, raisins, juices. However, some Islamic countries produce significant quantities of wine such as Algeria, which in 2011 produced 47,500 tons, many times more than Bosnia and Herzegovina.

Vines and grapes are mentioned a number of times in the Koran. Out of the total of 14 Surahs, nine Surahs refer to vines and grapes in different contexts[1]. We will mention some of them:

Surah Abasa, ayats 25 – 28:

(25)“ *We pour water abundantly,*

(26) *then split the earth in clefts*,

(27) *and make the grain to grow from it*

(28) *and grapes and vegetables*“

Surah Al-Baqarah, ayat 266;

„*Who of you would like to have a garden full of palm trees and grapevines through which rivers flow in which there are all kinds of fruits*“…

Surah Nahl, ayat 67;

„*And from the fruits of the palm trees and grapevines you make drinks and pleasant food. In that, indeed, is a sign to those who are wise*“.

Large quantities of raisins are produced in the Islamic world. According to a story, when Allah’s Prophet s.a. was given raisins, he said: “Eat, what a wonderful food raisins are, they relieve fatigue, calm anger, strengthen the nerves and beautify breath, remove mucus and purify.

1 Surah is a chapter in the Koran and the Koran has 114 Surahs, each being divided into ayats - verses, and it contains a total of 6,236 ayats. The Muslims believe that every verse in the Koran is a Word of God.

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VINOGRADARSKI SORTIMENTBOSNE I HERCEGOVINE

Podrijetlo hercegovačkih sorata

Jure Beljo

Sorta sa svojim genetskim potencijalima za prinos i kakvoću osnovni je preduvjet za uspješnu poljoprivrednu proizvodnju. U vinogradarstvu je značenje sorte veće nego u drugim kulturama jer o njoj ovise svojstva vina. Drugi čimbenici kao što su: način rezidbe, gnojidba, navodnjavanje ili fitosanitarne mjere mogu biti modificirane, ali genetski potencijali su uvjetovani sortom i odlučujući su jer prenose svoja svojstva, dobra ili loša u vino. Iza svakoga vina stoji jedna ili više sorata, a svaka sorta vinove loze ima jedinstvenu kombinaciju svojstava uključujući, aromu, okus i boju vinu. Nekadašnji su kultivari i proces sortne raznolikost u vremenu i prostoru prilično nepoznati. Usprkos dostupnosti mnogobrojnih bioarheoloških, morfoloških, povijesnih i genetičkih podataka, identitet ranijih sorata, povijesti, biogeografije i mehanizama domestikacije vinove loze ostaju nejasni.

Vinova loza (*Vitis vinifera*) je veoma raznolika vrsta s velikim brojem sorata. Današnji sortiment vinove loze rezultat je tisućljetnih slučajnih mutacija i križanja kao i usmjerene selekcije posljednja dva do tri stoljeća. Procjenjuje se da u svijetu danas ima između 6.000 i 11.000 različitih kultivara (Maul i sur., 2008.). Točan je broj kultivara veoma teško ocijeniti zbog velikoga broja sinonima i homonima, što je posljedica duge povijesti uzgoja, vegetativnoga razmnožavanja i intenzivnoga prenošenja materijala među zemljama i područjima. Schneider i sur. (2001.) pak smatraju da u svijetu ima između 5.000 i 8.000 kultivara, da se uzgajaju pod 14.000 – 24.000 različitih imena, a da se u većini vinograda u svijetu uzgaja približno 300 – 400 poznatih

GRAPEVINE VARIETIES IN BOSNIA AND HERZEGOVINA

Origin of Herzegovinian varieties

Jure Beljo

A variety with its genetic potential for yield and quality is a prerequisite for successful agricultural production. The significance of variety is higher in wine-growing than when growing other crops because characteristics of wine depend on it. Other factors such as the method of pruning, fertilization, irrigation or phytosanitary measures may be modified, but the genetic potentials are influenced by the variety and decisive since they pass their characteristics, good or bad ones, into wine. One or more varieties are behind each wine, and each grape variety has a unique combination of properties including aroma, taste and color of wine. Former cultivars and the process of varietal diversity in time and space are quite unknown. Despite the availability of numerous bioarcheologic, morphological, historical and genetic data, the identity of earlier varieties, history, biogeography and mechanisms of domestication of grapevine remain unclear.

Grapevine (*Vitis vinifera*) is a very diverse species with a large number of varieties. Present wine cultivars are the result of millennia-old random mutations and hybridizations as well as focused selections in the last two to three centuries. It is estimated that there are between 6,000 and 11,000 different cultivars in the world today (Maul et al., 2008). The exact number of cultivars is very difficult to assess because of a large number of synonyms and homonyms, which is a consequence of the long history of breeding, vegetative propagation and intense transfer of materials between countries and regions. Schneider et al. (2001) believe, however, that the world has between 5,000 and 8,000 cultivars, that



Slika 73. Blatina
Figure 73. Blatina

kultivara. Za najveći broj kultivara informacije o podrijetlu su rijetke ili ne postoje. Većina njih su dosta stari, neki čak i više stoljeća. Prvi opisi sorata pojavljuju se već u knjizi *Naturalis historiae* rimskoga pisca i prirodoslovca Plinija Starijeg. No to su prilično šturi opisi tako da je po njima moguće identificirati mali broj sorata. Sustavno proučavanje sortnih svojstava započinje tek u 19. stoljeću, na temelju svojstava lista, grozda i bobice. Podrijetlo i srodnost kultivara sada se utvrđuje genetskim markerima (Sefc i sur., 2009.).

U golemom mnoštvu svjetskoga sortimenta nalazi se i skroman broj naših hercegovačkih sorata. Većina je njih stara, a podaci o podrijetlu su rijetki ili ne postoje. Gotovo da ni jednoj hercegovačkoj sorti podrijetlo nije poznato i gubi se u tami povijesti. Budući da u Hercegovini postoji kontinuitet vinogradarstva više od 2000 godina, održale su se mnogobrojne lokalne sorte, tako da danas imamo veliki broj sorata koje su

they are grown under 14,000 to 24,000 different names, and that approximately 300-400 well-known cultivars are grown in most vineyards in the world. Information on origin are rare or nonexistent for most of cultivars. Most of them are quite old, some even centuries. The first descriptions of varieties appeared already in the book *Naturalis historiae* of the Roman writer and naturalist Pliny the Elder. But these are rather scant descriptions, so they can be used to identify a small number of varieties. Systematic study of varietal characteristics started only in 19th century, based on characteristics of leaf, grape and berry. The origin and kinship of cultivars are now determined by genetic markers (Sefc et al., 2009).

In the immense multitude of world cultivars, there is a modest number of our Herzegovinian cultivars. Most of them are old, and information about their origins are rare or nonexistent. Hardly any of Herzegovinian varieties has a known origin,

nastale u Hercegovini ili su donesene pa se prilagodile hercegovačkim ekološkim uvjetima. Nasuprot tome u Bosni, u kojoj je u određenom povijesnom razdoblju vinogradarstvo bilo veoma razvijeno, kontinuitet gajenja loze je prekidan pa se na tom području nisu održale sorte koje su nekada tu uzgajane. Moguće je naime da su se i u Bosni u stoljećima uzgoja vinove loze razvile posebne sorte prilagođene tom području, ali su izgubljene nestankom vinove loze.

Današnji sortiment vinove loze u Hercegovini rezultat je više evolucijskih, agroekoloških i povijesnih čimbenika, a među njima su najvažniji:

- formiranje autohtonoga sortimenta tijekom dugoga vremena prilagodbe uvjetima podneblja,
- blizina Dalmacije kao vinogradarskoga područja odakle su neke sorte prenesene i adaptirale se na uzgojne uvjete Hercegovine,
- introdukcija stranih sorata izvršena od turske vladavine do danas; neke od njih su se također prilagodile našim uvjetima i vjerojatno promijenile neka svojstva,
- uvođenje nekih sorata iz drugih vinogradarskih područja tijekom 20.stoljeća

Dosadašnji opisi i važnost pojedinih sorata

Različita vina podrijetlom iz Hercegovine, poput naziva Mostarac, Broćanac, Dubravsko i slično, pojavljuju se više puta u zapisima pojedinih putopisaca. Međutim imena sorata vinove loze u Hercegovini nema sve do druge polovine 19. stoljeća. Prvi spomen sorata vinove loze koje se uzgajaju u Hercegovini nalazimo kod fra Petra Bakule (1871.) koji piše:
"Crno grozdje i blatina,
Ruža, šljiva i skadarka.
Žutac, bielo i madjarka."

Od spomenutih sorata i danas se uzgajaju Blatina, Ruža i Šljiva, premda se te dvije posljednje ne ubrajaju u izrazito kvalitetne sorte. Skadarka je mađarska sorta koja se uzgajala u Hercegovini, ali nije jasno kada je i kako donesena u Hercegovinu. No čudno je da Bakula ne spominje Žilavku, ako pod sortom Žutac ne misli na tu sortu.

Poznati hrvatski lingvist Bogoslav Šulek u knjizi

they are lost in the obscurity of the past. Since there has been a continuity of wine-growing in Herzegovina for more than 2000 years, numerous local varieties are maintained, so that nowadays we have a large number of varieties that originate from Herzegovina or were brought and adjusted to Herzegovinian environmental conditions. On the other hand, in Bosnia, where wine-growing was highly developed in a specific historical period, continuity of growing vines was interrupted so that in this area the varieties that were once grown have not survived. Namely, in centuries of cultivation of vines in Bosnia, it is possible that special varieties suited to the area were developed, but were lost as grapevines disappeared.

The present varieties of grapes in Herzegovina are the result of a number of evolutionary, agroecological and historical factors, the most important among them being:

- formation of autochthonous cultivars over a long time of adjustments to climate conditions,
- proximity of Dalmatia as a wine growing region from where some varieties were transferred and adapted to cultivation conditions of Herzegovina,
- introduction of foreign varieties carried out in the period from the Ottoman rule to the present day; also, some of them have adapted to our conditions and probably changed some properties,
- introduction of some varieties from other wine-growing areas during the 20th century.

The previous descriptions and importance of individual varieties

Various wines of Herzegovinian origin, such as those named Mostarac, Brocanac, Dubravsko and the like, appeared a number of times in writings of some travel writers. However, there were no names of grape varieties in Herzegovina until the second half of the 19th century. The first reference to grape varieties that are grown in Herzegovina are found with Father Petar Bakula (1871) who wrote:

"Crno grozdje i blatina, (Red grape and blatina, Ruža. šljiva i skadarka, Ruza sliva and skadarka

Jugoslavenski imenik bilja (Šulek, 1879.) navodi oko 800 naziva različitih sorata koje se uzgajaju u Hrvatskoj. Među njima ima ih više koje imaju iste nazive kao i neke sorte koje se danas uzgajaju u Hercegovini. To su: Dobrogostina, Kadarun, Lipolist, Plavka ili Plavina, Mali i Veli Pošip, Podbel, Ranka, Rezaklija, Ruža, Ružica, Šljiva, Trnak. Budući da je u to vrijeme Bosna i Hercegovina još uvijek bila pod osmanskom vlašću, Šulek nije navodio imena hercegovačkih sorata. No iz Šulekova popisa dade se zaključiti kako u vinovoj lozi postoje brojni sinonimi i homonimi. Naime za Lipolist se navodi da je iz Slavonije, a Ljepolist iz Dalmacije. Sorta Podbel podsjeća na našu sortu Podbjel ili Podbil, ali je po Šuleku podrijetlom iz Zagreba. Isto tako, po Šuleku Trnak je iz Gline u Hrvatskoj, Rezaklija iz Broda u Slavoniji, Šljiva i Ružica iz Srijema. Ostale sorte koje navodi Šulek podrijetlom su iz Dalmacije i moguće je da su to iste sorte kao i one koje se uzgajaju u Hercegovini. No Šulek samo nabraja nazive sorata, a nema njihova opisa.

Tek se nakon austrougarske okupacije mogu naći nazivi autohtonih hercegovačkih sorata vinove loze i njihovi opisi. Kada je Leonard Roessler 1883. godine provodio prve analize vina iz Bosne i Hercegovine, naveo je i neke sorte od kojih je uzimao uzorke. Roessler primjerice navodi da se u konjičkom i prozorskom kraju uzgajaju sorte Skadarka, Slatina, Zelenka, Podbjel i Krkošija, koja je izrazito zastupljena. Od navedenih sorata danas u proizvodnji još postoje Podbjel i Krkošija.

U prvom popisu poljoprivrede Bosne i Hercegovine iz 1895. nalazi se detaljan opis nekih hercegovačkih sorata. U tom popisu od bijelih sorata spominju se Žilavka, kao najraširenija i najkvalitetnija sorta, te Bena, Krkošija, Pošip, Rezakija i Jazočka. Od sorata crnoga grožđa u popisu se spominju Blatina i Skadarka. Kaže se da je Skadarka zapravo identična mađarskoj sorti Plava kadarka i u Hercegovini u normalnoj zrelosti daje harmonično, jako crveno vino tamnocrvene boje. No glavna sorta crnoga grožđa je Blatina i ona se najviše uzgaja. Vinogradarski stručnjaci koje je austrougarska uprava dovela iz drugih dijelova Monarhije da rade na unapređenju vinogradarstva odmah su zapazili kakvoću Žilavke i Blatine i započeli su na stanicama u Gnojnicama i Lastvi klonsku selekciju tih sorata kako bi izdvojili i

Žutac, bielo i madjarka,. “ Zutac bielo and madjarka).

Of these varieties, Blatina, Ruza and Sljiva are grown even today, although the last two do not fall into distinctly high-quality varieties. Skadarka is a Hungarian variety that is grown in Herzegovina, but it is not clear when and how it was brought to Herzegovina. But it is strange that Bakula does not mention Zilavka, unless he was meaning that variety under the variety of Zutac (Yellowing).

In the book the Yugoslav Register of Plants (Sulek, 1879), the renowned Croatian linguist Bogoslav Sulek lists about 800 names of different varieties that are grown in Croatia. They include several that have the same names like some varieties that are grown in Herzegovina nowadays. These are: Dobrogostina, Kadarun, Lipolist, Plavka or Plavina, Mali and Veli posip, Podbel, Ranka, Rezaklija, Ruza, Ruzica, Sljiva, Trnak. Since Bosnia and Herzegovina was still under the Ottoman rule at the time, Sulek did not indicate names of Herzegovinian varieties. But it can be concluded from Sulek’s list that there are many synonyms and homonyms in grapevines. Namely, Lipolist is stated to be from Slavonia, and Ljepolist from Dalmatia. The variety Podbel is reminiscent of our variety Podbjel or Podbil, but according to Sulek it comes from Zagreb. Likewise, according to Sulek, Trnak is from Glina in Croatia, Rezaklija from Brod in Slavonia, Sljiva and Ruzica from Srijem. Other varieties listed by Sulek originate from Dalmatia and it is possible that these are the same varieties as those that are grown in Herzegovina. But Sulek only listed names of varieties, their description was not there.

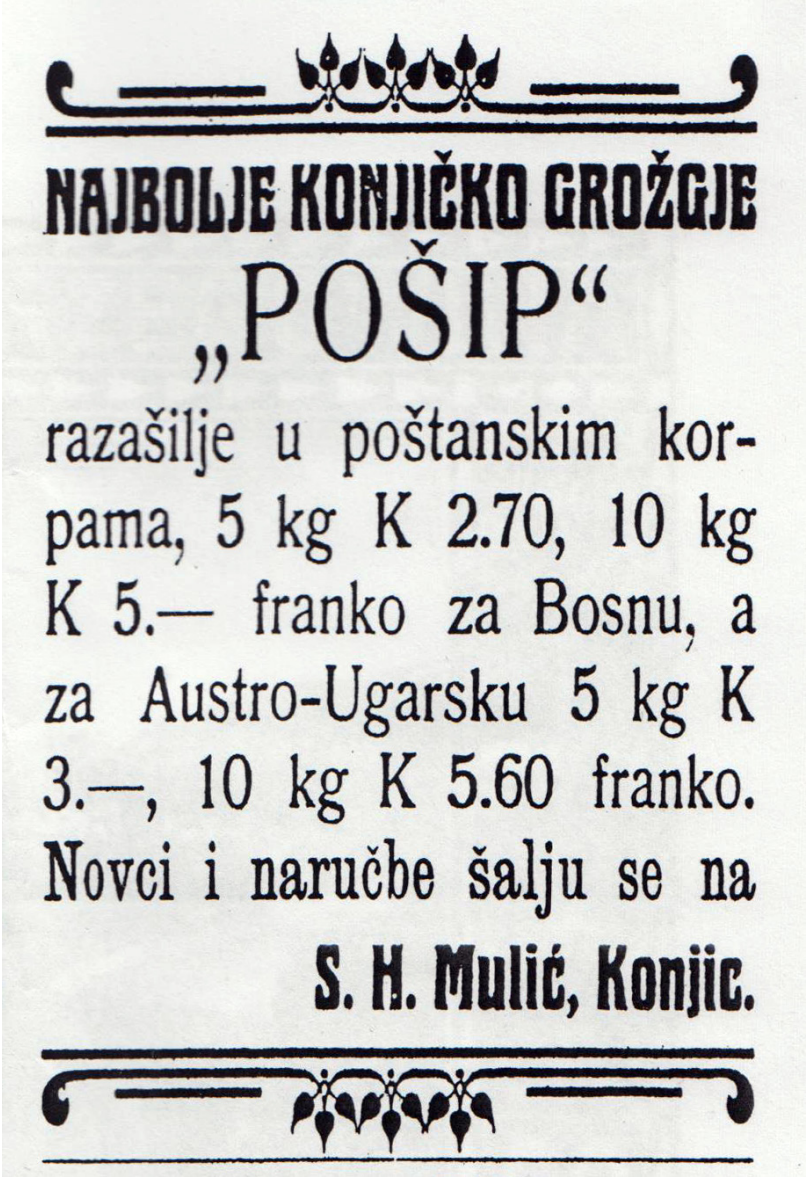
It is only after the Austro-Hungarian occupation that names of autochthonous Herzegovinian grape varieties and their descriptions could be found. When Leonard Roessler conducted first analyses of wines from Bosnia and Herzegovina in 1883, he stated some varieties that he sampled. For example, Roessler stated that the varieties grown in the areas of Konjic and Prozor were Skadarka, Slatina, Zelenka, Podbjel and Krkosija, which was distinctly dominant. Of these varieties, Podbjel and Krkosija today still exist in production.

The first register of agriculture of Bosnia and Herzegovina from 1895 contains a detailed

raširili po terenu najbolje klonove.

Carl Neufeld (1901) je u ispitivanju kakvoće hercegovačkoga vina analizirao 48 uzoraka od raznih sorata iz cijele Hercegovine. Neufeld u svom izvješću navodi sve sorte koje je analizirao i lokacije s kojih je uzeo uzorke grožđa. Od bijelih sorata najviše je bilo uzoraka Žilavke, a pored toga navode se još Krkošija, Dobrogostina, Podbijel i Rezakija. Među uzorcima crnih sorata najviše je bilo Blatine, a ispitani su još uzorci: Skadarke, Žestaca, Crne Pošipi, Osine i Alicant Bouschet. Neufeld nije ispitivao morfološka i biološka svojstva loze, već samo svojstva vina od ispitivanih sorata. Većina tih sorata i danas se nalaze u proizvodnji, a neke su nestale.

description of some Herzegovinian varieties. Of the white varieties this list specifies Zilavka, as the most widespread and the highest-quality variety, and Bena, Krkosija, Posip, Rezakija and Jazocka. Of red grape varieties the list refers to Blatina and Skadarka. Skadarka is said to be actually identical to the Hungarian variety Plava Kadarka and in Herzegovina in normal maturity it gives harmonious, strong red wine of a dark red color. But the main red grape variety is Blatina and it is most commonly grown. Vineyard experts that the Austro-Hungarian administration brought from other parts of the Empire to work on improving viticulture immediately noticed the quality of Zilavka and Blatina and at stations in Gnojnice and Lastva began clonal selection of



Slika 74. Oglas za sortu Pošip s početka 19. stoljeća
Figure 74. Advertisement for the variety Posip from the early 19th century

Nakon toga se brojni drugi istraživači i vinogradari bave ispitivanjem i opisom hercegovačkih sorata. Ljubomir Stjepanović 1921. godine u radu *Vinogradarstvo i vina Bosne i Hercegovine* navodi sorte koje se uzgajaju u Hercegovini. Uz Žilavku, Blatinu i Krkošiju kao najvažnije sorte, o kojima daje širi osvrt, spominje još: Benu, Rezakiju, Pjegavac, Jazočku, Lipolist, Zložder, Podbjel, Rukavac i Granu od bijelih, te Plavku, Pošib, Nincušu, Sjerinu, Oručevku, Žestac, Surac i Osinu od crnih sorata. Stjepanović navodi i stolne sorte Crnu i Bijelu pošib, Šljivu, Ružu i Nadiđar. Sličan prilog o hercegovačkim sortama iznosi i Lovrenović 1928. godine.

Prvi detaljan opis sorata vinove loze na našim prostorima dao je Stjepan Bulić. U knjizi *Dalmatinska ampelografija* prilično detaljno je opisano 200 sorata. Među opisanim sortama nalazi se također stanovit broj onih koje se uzgajaju u Hercegovini. Dalmacija i Hercegovina su susjedna vinogradarska područja sa sličnim agroekološkim uvjetima pa ima dosta sorata koje se uzgajaju na oba područja. Neke od njih vode podrijetlo iz Dalmacije, a neke iz Hercegovine.

Najširi popis hercegovačkih sorata vinove loze prikazan je prilikom nagradne izložbe grožđa u Mostaru u rujnu 1930. godine. Tom je prigodom bilo izloženo grožđe 45 različitih sorata.To su: Banduruša, Bena, Blatina, Crnac, Diđar (Nadiđar), Dobrogostina, Dragoboština (Dobrogostina?), Drenak (rozo), Drenak crni (Konjic), Elezovka, Gabeljak, Hrskavac, Krkošija (žuta, zelena, tičarka), Menigovka, Oručevka, Osijenac, Pirgo, Plavina (ružičasta), Plavka, Podbil, Popovka, Prošip bijela, Prošip crvena, Rezakija, Rukatac, Ruža, Šarka, Šljiva, Torbara, Trnjak, Zlatarica, Zložder, Žestac, Žilavka (žuta, zelena, mala, velika), Žujičar (Arhiv HNŽ, Seosko načelstvo Mostar, 1921. - 1940.). Popis sorata s te izložbe ukazao je istraživačima, koji su radili na inventarizaciji hercegovačkih sorata, koje će sorte tražiti po terenu. Veći dio tih sorata pronađen je i kolekcioniran, dio je izgubljen, a neke sorte nisu bile autohtone hercegovačke sorte pa nisu ni kolekcionirane.

Iako je hercegovački vinogradarski rajon relativno ograničen i ima slične uzgojne uvjete, na cijelom području, još uvijek postoji veliki broj sorata, vinskih i stolnih, bijelih i crnih.

these varieties in order to extract the best clones and spread them out in the area.

In testing the quality of wines from Herzegovina, Carl Neufeld (1901) analyzed 48 samples of various varieties from all over Herzegovina. In his report, Neufeld listed all varieties that he had analyzed and locations from which he had taken the samples of grapes. Of the white varieties, most were samples of Zilavka, and besides Krkosija, Dobrogostina, Podbijel and Rezakija were additionally listed. Among the samples of red varieties most were Blatina, while other tested samples were those of Skadarka, Zestac, Crni posip, Osina and Alicante bouschet. Neufeld did not examine morphological and biological properties of vines, but only properties of wines from the tested varieties. Most of these varieties are still in production, and some have gone.

After that many other researchers and winegrowers have been engaged in examining and describing Herzegovinian varieties. In 1921, Ljubomir Stjepanovic listed varieties that were grown in Herzegovina in the paper “Viticulture and wines of Bosnia and Herzegovina”. In addition to Zilavka, Blatina and Krkosija as the most important varieties, on which he makes a comprehensive review, he also mentions, Bena, Rezakija, Pjegavac, Jazocka, Lipolist, Zlozder, Podbjel, Rukavac and Grana out of white ones, and Plavka, Posib, Nincusa, Sjerina, Orucevka, Zestac, Surac and Osina out of red varieties. Stjepanovic also listed the table varieties Crna and Bijela posib, Sljiva, Ruza and Nadidjar (Stjepanovic, 1921). A similar contribution on Herzegovinian varieties was presented also by Lovrenovic in 1928.

The first detailed description of grape varieties in our area was provided by Stjepan Bulic. His book the *Dalmatian ampelography* describes 200 varieties in some detail. The described varieties also include a certain number of varieties that are grown in Herzegovina. Dalmatia and Herzegovina are adjacent viticultural areas with similar agroecological conditions, so there are plenty of varieties that are grown in both areas. Some of them originate from Dalmatia and some from Herzegovina (Bulic, 1949).

The widest list of Herzegovinian grape varieties

Cjelokupni autohtoni sortiment vinove loze može se podijeliti u tri skupine. U prvoj skupini su najvažnije sorte koje se komercijalno uzgajaju na najširoj osnovi i čine više od 90 % ukupnih vinogradarskih površina domaćih sorata. U toj su skupini: Žilavka, Krkošija, Bena i Dobrogostina od bijelih, te Blatina i Trnjak od crnih sorata.

U drugoj su skupini sorte koje su danas od manjega gospodarskog značenja. Nekada su uzgajane u većem opsegu, pa su čak vina od tih sorata dobivala nagrade na sajmovima, poput Oručevke i Žestaca, ali ih danas ima manje u novim komercijalnim vinogradima. Nešto su više zastupljene u starijim vinogradima. Među takvim sortama su Plavka, Šljiva bijela i crna, Pošip bijeli i crni, Žestac, Oručevka, Podbjel (Podbil), Mala Blatina, Rezakija, Elezuša, Čevruša, Menigovka, Zložder, Surac, Nadiđar, Medenka.

Ostale sorte nemaju danas gotovo nikakvo gospodarsko značenje, mogu se još naći samo

was presented during the prized grape show in Mostar in September 1930. Grapes of 45 different varieties were put on display on that occasion. The list of varieties from this show helped researchers who worked on the inventory of Herzegovinian varieties to know which varieties they would be looking for in the area. Most of these varieties were found and collected, part was lost, while some varieties were not autochthonous Herzegovinian varieties so they were not collected after all.

Although the Herzegovinian wine-growing zone is relatively limited and has similar growing conditions throughout the area, still there is a large number of varieties, wine and table ones, white and red ones. Overall the autochthonous grapevine varieties can be divided into three groups. The first group includes the most important varieties that are grown commercially on a widest basis and account for more than 90% of the total vineyard area of local varieties. Varieties in this group are Zilavka, Krkosija, Bena



Slika 75. Žilavka
Figure 75. Zilavka

kao pojedinačna stabla u starim vinogradima ili na odrinama. No neke od tih sorata mogle bi korisno poslužiti u kombinaciji s drugim sortama, neke kao stolne sorte, a neke u oplemenjivačkim programima za razvoj novih sorata.

Nažalost mnoge su naše autohtone sorte izgubljene za vrijeme obnove vinograda nakon Prvoga svjetskog rata. Tada je, nakon što je filoksera uništila vinograde u Hercegovini, započela obnova vinograda cijepljenjem na američke podloge. Tom prigodom neke sorte koje su bile od manjega gospodarskog značenja, ili ih je možda filoksera uništila, jednostavno nisu cijepljene, nisu dakle obnovljene i na taj način zauvijek izgubljene. Koliko je takvih sorata izgubljeno, nitko na zna, ali je moguće da je među njima bilo i onih koje su po nekim svojstvima bile veoma korisne. U novije vrijeme intenzifikacijom vinogradarske proizvodnje u plantažnim vinogradima, vinogradari se orijentiraju na sadnju samo pet do šest najpoznatijih sorata, dok ostale sorte polako, ali sigurno nestaju iz svoga prirodnog staništa. Po našim spoznajama neke sorte su se uzgajale u značajnom opsegu, ali im se danas izgubio svaki trag. Među takvima su: Gabeljak, Grana, Jazočka, Osina, Pirgo, Popovka, Rukatac, Torbara, Trojka, Zizip i druge.

U ovoj monografiji opisat ćemo detaljnije samo najvažnije sorte, one koje se najviše koriste u proizvodnji vina i koje su do sada više ili manje istražene. Najviše su istražene: Žilavka, Krkošija, Bena, Blatina, Trnjak i Plavka od domaćih, te Alicant Bouschet i Vranac od introduciranih sorata. Samo su djelomice istražene Dobrogostina, Pošip bijeli, Pošip crni, Zložder, a o ostalim sortama gotovo da nema znanstvenih i stručnih informacija. Na Agronomskom i prehrambeno-tehnološkom fakultetu u Mostaru posljednjih godina provodi se analiza ampelografskih svojstva hercegovačkih sorata prema službenom OIV-deskriptoru. Do sada je opisano petnaestak sorata (Buntić i sur., 2010., Knezović, 2011.), a uspostavljanjem kolekcijskoga nasada na fakultetskom poligonu u Rodoču opis će se ubrzati, tako da u skoroj budućnosti možemo očekivati detaljan opis svih hercegovačkih sorata vinove loze.

U okviru projekta inventarizacije i karakterizacije

and Dobrogostina of white varieties and Blatina and Trnjak of red ones.

In the second group are the varieties that now have a minor economic significance. They used to be grown on a larger scale, so the wines of some of those varieties even received awards at fairs, like Orucevka and Zestac, but today they are found less in new commercial vineyards. They are slightly more represented in older vineyards. Such varieties include Plavka, white and red Sljiva, white and red Posip, Zestac, Orucevka, Podbjel (Podbil), Mala blatina, Rezakija, Elezusa, Cevrusa, Menigovka, Zlozder, Surac, Nadidjar, Medenka.

Today, other varieties do not have almost any economic significance, they can be found only as single trees in old vineyards or on trellis works. But some of these varieties could serve a useful purpose in combination with other varieties, some as table grape varieties, and some in breeding programs for development of new varieties.

Unfortunately many of our autochthonous varieties were lost during the renewal of vineyards after the First World War. That is when renewal of vineyards began by grafting on American rootstocks after phylloxera had destroyed vineyards in Herzegovina. On that occasion, some varieties that had a minor economic significance, or that may have been destroyed by phylloxera, were simply not grafted, so they were never renewed and thus were lost forever. Nobody knows how many such varieties were lost, but those that have some of very useful characteristics are likely to have been among them. Recently by increasing production of grapes in plantation vineyards, winegrowers concentrate on planting only five to six most popular varieties, while other varieties are slowly but surely disappearing from their natural habitat. According to our findings, some varieties were cultivated to a significant extent, but today they are lost without a trace. Such varieties include Gabeljak, Grana, Jazocka, Osina, Pirgo, Popovka, Rukatac, Torbara, Trojka, Zizip and others.

In this monograph, we describe in more detail only the most important varieties, those that are most commonly used in production of wine and that have been more or less studied so far. The varieties



Slika 76. Kolekcijski nasad za hercegovačke sorte loze u Rodoču
Figure 76. Collection plantation for Herzegovinian varieties in Rodoc

hercegovačkih sorata vinove loze, u suradnji sa Zavodom za oplemenjivanje bilja, genetiku i biometriku Agronomskog fakulteta Sveučilišta u Zagrebu, provedena je genotipizacija 30 sorata (Leko i sur., 2012.). Genetski profili određeni su pomoću devet mikrosatelitnih (SSR) markera prema metodici korištenoj u projektu Grapegen06 (http://www1.montpellier.inra.fr/grapegen06/). Genetski odnosi među analiziranim sortama prikazani su pomoću dendrograma (slika79.). Zahvaljujući provedenoj genotipizaciji pronađeni su sinonimi u hercegovačkom sortimentu, a riješene su također dvojbe oko porijekla nekih sorata koje se uzgajaju u Hercegovini poput Male blatine (Lacombe i sur., 2012) i Dobrogostine. Profili svjetskih sorata za usporedbu s našim sortama preuzeti su s European Vitis Database, a nastali su u sklopu projekta GrapeGen06.

that have been most investigated are Zilavka, Krkosija, Bena, Blatina, Trnjak and Plavka out of local ones, and Alicant Bouschet and Vranac out of introduced varieties. Dobrogostina, Posip bijeli, Posip crni, have been only partially studied, and there is hardly any scientific information on other varieties. In recent years, the Faculty of Agriculture and Food Technology, University of Mostar, has been conducting an analysis of ampelographic characteristics of Herzegovinian varieties according to the official OIV descriptor. Fifteen varieties have been described so far (Buntić at al., 2010, Knezović, 2011), and the collection plantation established in the faculty's field in Rodoc will speed up describing, so we can expect a detailed description of all Herzegovinian grape varieties in the near future.

Within the project of inventory and characterization of Herzegovina grape varieties, in collaboration with the Department of Plant Breeding, Genetics and Biometrics, Faculty of Agriculture, University of Zagreb, genotyping of 30 varieties was conducted (Leko et al., 2012). Genetic profiles were determined using nine microsatellite (SSR) markers according to the

Metode korištene u identifikaciji i opisu sorata vinove loze

Ana Mandić

Način identifikacije

Sorta (kultivar) je populacija biljaka jedne vrste koja se odlikuje nizom specifičnih bioloških i gospodarski važnih svojstava po kojima se razlikuje od drugih, ta svojstva pokazuju sve jedinke populacije, a zadržavaju se nakon reprodukcije (Maletić i sur., 2008.).

Usljed globalizacije tržišta vina došlo je do širenja i eksploatacije nekoliko poznatih vinskih kultivara (kao Chardonnay, Cabernet Sauvignon, Syrah, Merlot, Pinot noir, Riesling). Ovo čini tržište vina konzervativnim ne samo globalno već i lokalno gdje opet postoje prepoznatljive vinske sorte, dok su ostale manje korištene, danas ugrožene i održavaju se samo kao pojedinačna stabla uz okućnice i odrine, ili u poljskim kolekcijama instituta koji se bave očuvanjem biljnih genetičkih resursa. Takav trend imamo i u Hercegovini gdje uz naše poznate sorte Žilavka i Blatina te par pratećih, ostale su nepoznate, potisnute i neiskorištene.

Usprkos dugoj tradiciji uzgoja vinove loze u Hercegovini ne postoji jedinstven dokument u kojemu su detaljno opisane najvažnije hercegovačke sorte. Posebice se to odnosi na manje zastupljene sorte, a brojne nisu uopće opisivane. Različiti genotipovi nazivaju se istim imenima, a pri tomu nemaju ista svojstva, ili se radi o različitim imenima za sorte sličnog izgleda. Obzirom na veliku adaptabilnost vinove loze kao vrste, te varijabilnost mikroklimatskih i agroekoloških uvjeta, nije jednostavno identificirati sorte na mjestu uzgoja.

Opis i identifikacija sorata vinove loze moguća je ocjenom morfoloških pokazatelja, biokemijskim i molekularnim metodama. Danas se osnovna identifikacija provodi prvenstveno pomoću morfoloških pokazatelja navedenih u odgovarajućem deskriptoru. Međunarodna organizacija za lozu i vino (OIV) sačinila je posebnu ampelografsku shemu – OIV deskriptor, za identifikaciju sorata vinove loze (Office International de la Vigne et du Vin, methodology used in the project Grapegen06 (http://www1.montpellier.inra.fr/grapegen06/). Genetic relationships among the analyzed cultivars are shown using a dendrogram (Figure 79.). Thanks to our genotyping synonyms among Herzegovinian varietiest were found and doubts about the origin of some varieties that are grown in Herzegovina as Small blatine (Lacombe et al., 2012) and Dobrogostine were also resolved. Profiles of world varieties for comparison with our varieties are taken from the European Vitis Database, and were created as part of the GrapeGen06 project.

Methods used in identification and description of grapevine varieties

Ana Mandic

Identification means

Variety (cultivar) is a population of plants of a single kind that possesses a series of specific biological and economically important characteristics that distinguish it from others, these properties are manifested in all individuals of the population, and are retained after reproduction (Maletic et al. 2008).

Globalization of the wine market has resulted in expansion and exploitation of several well-known wine cultivars (like Chardonnay, Cabernet Sauvignon, Syrah, Merlot, Pinot Noir, Riesling). This makes the wine market conservative, not only globally but also locally, where again there are recognizable wine varieties, while others are less used, today endangered, and cultivated as single trees in backyards or on grape arbors, or in field collections of institutes engaged in conservation of plant genetic resources. This trend is also present in Herzegovina where, with our well known varieties Zilavka and Blatina with a few supporting ones, others are unknown, supplanted and unused.

Despite the long tradition of wine growing in Herzegovina, an integrated, detailed document that would describe the most important grapevines cultivars of Herzegovina does not exist. That particularly applies to less common varieties, and many of them have never been described.

2009.). Premda su ampelografske metode brze i pouzdane, opterećene su utjecajem okolinskih čimbenika na izražavanje svojstava vinove loze, te subjektivnim pristupom i iskustvom samog ampelografa (Dettweiler i sur., 2000.). Stoga se u u svrhu pouzdane identifikacije sorata sve više koriste metode DNK markera, među kojima mikrosateliti odnosno SSR markeri postaju danas standard (Maletić i sur., 2008.).

Ampelografski opisi vinove loze

Ampelografija je dio botanike koja se bavi proučavanjem, identifikacijom i podjelom vinove loze. Riječ 'ampelografija' korištena je prvi put u 17 stoljeću, a upotrijebio ju je Philip Jacob Sachs u svom enciklopedijskom radu o grožđu i vinu (Martinez i Grenan 1999.), iako ampelografija potječe i od davnina. Početkom dvadesetog stoljeća izlazi Ampelografija od Viala i Vermorela, ali do kraja Drugog svjetskog rata bila je više umjetnost nego standardizirana metoda. Francuz Pierre Galet, kojeg katkad nazivaju i 'ocem ampelografije' razvija novi pristup u kojem je naglasak na obliku i konturama lista i liski te vrška mladice, a manje na bobicama i grozdu (Dexheimer, 2011.). Kako se ampelografija razvija tako je i sve veći broj svojstava standardiziran za ocjenjivanje.

Ampelografska identifikacija sorata vinove loze i danas se sastoji od opažanja i opisa dijelova biljke. U ranim 80-im godinama prošlog stoljeća OIV, UPOV (L'Union internationale pour la protection des obtentions végétales - Međunarodna unija za zaštitu novih biljnih sorata) i FAO odlučili su se za jedinstven pristup morfološkom opisu kultivara vinove loze, što je rezultiralo OIV deskriptorima za sorte loze i vrste roda *Vitis*, koji definiraju standard ampelografskih svojstava (OIV, 1983.). Sorte se opisuju prema tzv. ampelografskoj shemi.

Ustroj sheme:

- ime sorte, sinonimi i homonimi
- podrijetlo sorte
- rasprostranjenost
- morfološka obilježja
- agrobiološka obilježja

Different genotypes are called the same names, while not having the same characteristics, or different names for varieties of similar appearance are involved. Considering the wide adaptability of grapevine as a species and variability of microclimatic and agro-ecological conditions, it is not easy to identify varieties on the spot of cultivation.

Describing and identifying grape varieties is possible by evaluating morphological parameters by using biochemical and molecular methods. Basic identification is currently conducted primarily using morphological indicators by the descriptor code. The International Organisation of Vine and Wine (OIV) has created a special ampelographic scheme - OIV descriptor, for identification of grape varieties (Office International de la Vigne et du Vin, 2009). Although ampelographic methods are fast and reliable, they are under the influence of environmental factors on the expression of vine characteristics, as well as the subjectivity and experience of the ampelographer himself (Dettweiler et al., 2000). Therefore, the methods of DNA markers are increasingly used for the reliable identification of varieties, among which microsatellites or SSR markers are becoming a standard today (Maletic et al., 2008).

Ampelographic descriptions of grapevine

Ampelography is a field of botany dealing with studying, identifying and classification of grapevine Vitis spp.. The word 'ampelography' was used for the first time in the 17th century by Philip Jacob Sachs in his enciclopedic work on vine and wine (Martinez and Grenan 1999.), although the method is from ancient times. The book *Ampelography* by Viala and Vermorel appeared at the beginning of the 20th century. By the end of the Second World War, ampelography was more of an art then standardised method. Pierre Galet, called the 'father of ampelography' developed a new approach based on the shape and contours of leaves, growing shoots, shoot tips, and petioles rather than on grape clusters. With the development of ampelography, the number of standardized descriptions of characteristics increased.

The ampelographic identification of grape

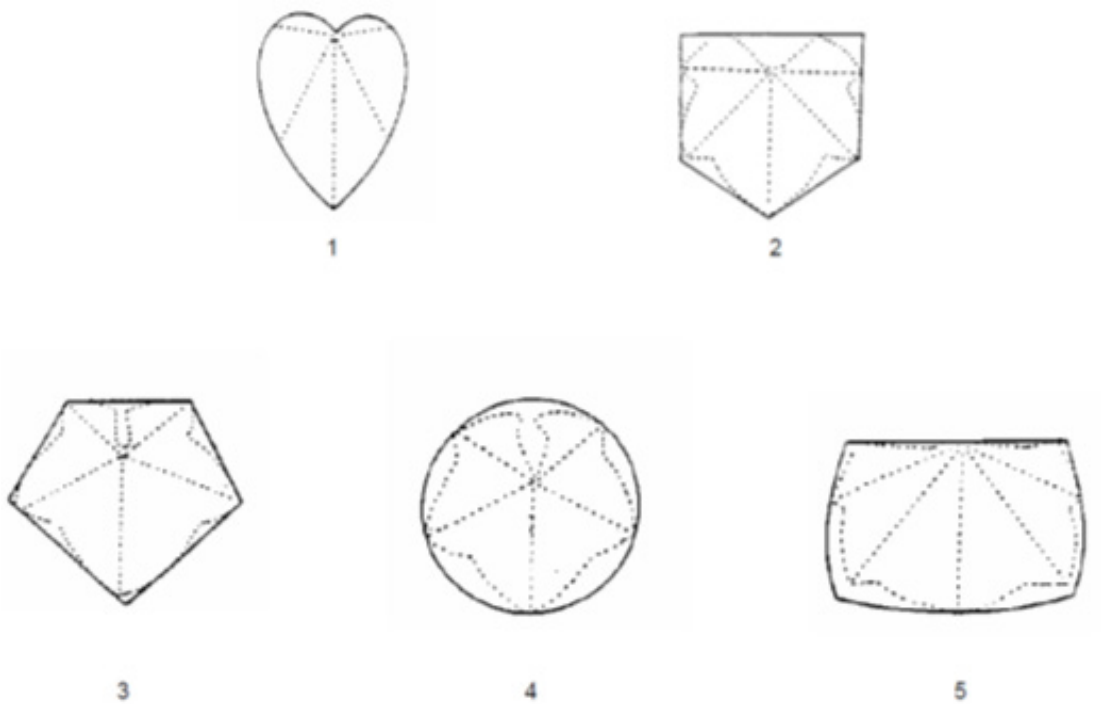
- gospodarsko – tehnološka svojstva
- regionalizacija sorte
- unutarsortna varijabilnost
- bibliografski podatci (izvori)

Svako je svojstvo označeno tzv. OIV kodom, a očitovanje brojem (OIV, 1983.). Propisano je vrijeme i broj opažanja, te dio trsa koji se evaluira. Opisuje se vršak mladice i središnji dio mladice u stadiju cvatnje. Mladi list opisuje se u vrijeme cvatnje i potpuno razvijen list koji se prati između formiranja bobica i početka šare. Rozgva se promatra nakon opadanja lista, odnosno u stadiju mirovanja vegetacije, a cvat na prošlogodišnjoj rozgvi. Grozd u punoj zriobi, a uzima se prosječna vrijednost najvećeg grozda na 10 izboja. Bobica u punoj zriobi, a uzima se 30 normalno razvijenih bobica iz središnjeg dijela grozda. Sjemenka: formiranje, cjelovitost, broj. Za većinu svojstava potrebno je najmanje 10 uzoraka. Ocjenjuju se brojevima, ali se kod predstavljanja sorte ne navode brojevi već opis iza njih. Za svaki deskriptor navedene su i referentne sorte odnosno vrste roda *Vitis*, poznate i opisane tipične za pojedini atribut. Osim navedenih prati se i vrijeme cvatnje, pupanja, formiranja grozda,

varieties is based on the observation of features on some organs of a grape. In the early 1980s the OIV, UPOV (L'Union internationale pour la protection des obtentions végétales - International Union for the Protection of New Plant Varieties) and FAO agreed on a uniform approach to the description of wine grape characteristics, and document "OIV descriptor list for grape varieties and Vitis species" was created (OIV, 1983). Varieties are described against the ampelographic scheme

Scheme organization:

- variety name, synonyms and homonyms
- variety origin
- variety area of distribution
- morphological characteristics
- agro-biological characteristics
- economical and technical characterization
- regional distribution
- intravarietal variability
- bibliographic data (sources)



Slika 77. Primjer svojstva koje se ocjenjuje. Odrastao list oblik liske. Kodovi za svojstvo: OIV 067, UPOV 18; IPGRI 6.1.22. 1 – srcolik oblik; 2 – klinast; 3 – peterokutan; 4 – okrugao; 5 – bubrežast

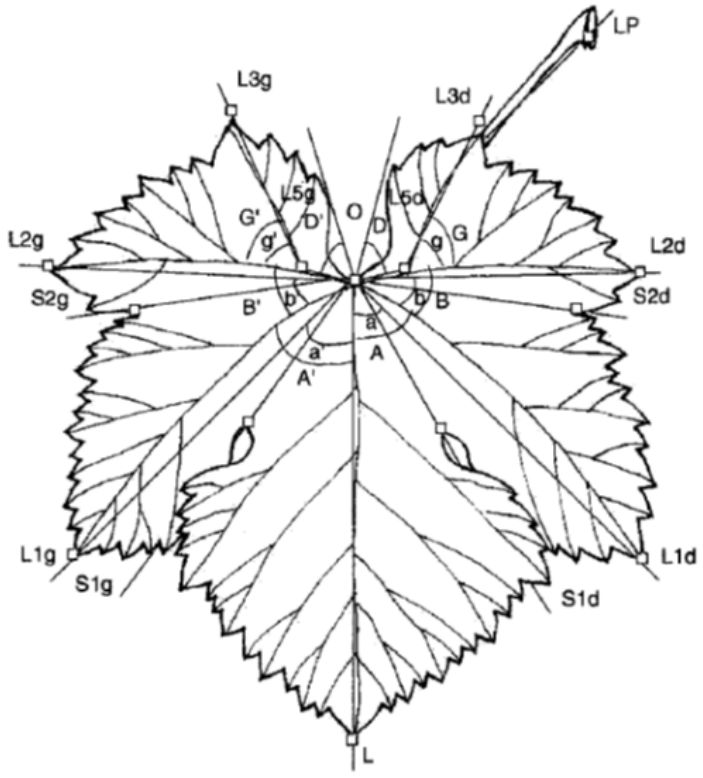
Figure 77. An example of a descriptive characteristic. Mature leaf, shape of blade: 1 - cordate; 2 - wedge-shaped; 3 - pentagonal; 4 - circular; 5 - kidney-shaped

otpornost na neke bolesti, a deskriptori danas uključuju i SSR molekularne markere.

Kako je opis pojedinih organa vinove loze, procjena veličine, oblika i omjera izložen subjektivnoj procjeni istraživača uvode se različita mjerenja odnosno ampelometrijske metode u cilju objektivnih rezultata. Razvijena je metodologija mjerenja lista, površine, duljine, širine, dubine sinusa, duljine peteljke, veličine zubaca (slika 78). Ova se metodologija naziva ampelometrijom, dok se mjerenje grozda i bobice naziva uvometrija. Mjerenja grozda i bobice uključuje: masu, duljinu, širinu, broj i dimenzije bobica, mehaničku analizu. Sve to u svrhu jednostavnijeg i točnijeg identificiranja i opisa sorti. U ampelometriji se danas koriste računala i različiti specijalizirani programi koji rade na principu analize fotografija i doprinose standardizaciji opisa sorti. Na slici 78 prikazane su neke od točki koje označavamo i na osnovu kojih program izračunava i prikazuje deskriptore.

Jedan od programa je i SuperAmpelo, program razvijen u Microsoft Visual Studio.Net i kompatibilan sa MsAcess bazom podataka (slika 78).

Characteristics of vine are assigned a so-called OIV code, and evaluated by a number (OIV, 1983). Time and number of observations are prescribed, as well as the part of vine being evaluated. The description considers young shoot and the central part of shoot in the flowering stage. Young leaf is observed during flowering and mature leaf observed between berry set and veraison. Woody shoot that is observed after leaf fall, or during dormancy. Flower and inflorescence on last year's canes. Bunch at maturity, mean value of the largest bunches of 10 shoots. Berry at maturity, mean value of 30 non deformed and normally sized berries taken from the middle part of 10 bunches. Seed: formation, completeness, number. For most of the characteristics it is necessary to have at least 10 samples. They are assessed by numbers, but presentation of variety does not specify numbers but descriptions behind them. Reference varieties or species of the genus *Vitis*, known and described typical for an individual attribute, are also listed for each descriptor. In addition to these, time of flowering, budding, bunch formation and resistance to some diseases are also monitored, while descriptors today also include SSR molecular markers.



Slika 78. Prikaz ampelometrijskih (filometrijskih) mjerenja
Figure 78. A view of ampelometric measurements

Molekularno – genetičke metode identifikacije sorata

Klasične fenotipske metode nisu uvijek dovoljne radi nestabilnosti morfoloških svojstava odnosno utjecaja okoline na njih, te su neprimjenjive kod mladih biljaka u stadiju sadnice ili izoliranih dijelova biljke (Tessier i sur. 1999).

Stoga se za identifikaciju sorata vinove loze počinju koristiti prvo izoenzimi te kasnije i molekularni markeri kao RFLP, RAPD, SSR ili mikrosateliti, AFLP, SNP.

Molekularno – genetičke metode zasnivaju se na analizi varijabilnosti DNK molekule, za koju je brojnim eksperimentima potvrđeno da se prenosi iz generacije u generaciju bez utjecaja čimbenika okoline. Stoga su ove metode prikladne za identifikaciju, jer jednom potvrđena DNK može biti provjerena na bilo kojem mjestu i u bilo kojoj razvojnoj fazi biljke. Ove se metode mogu koristiti kao dopuna ampelografiji ili samostalno. Danas su molekularne metode postale uobičajen alat u identifikaciji, utvrđivanju srodnosti i oplemenjivanju vinove loze.

Kod vinove loze u primjeni su najčešće SSR ili mikrosatelitni markeri, koji omogućuju identifikaciju sorata i podloga, rekonstrukciju porijekla i analizu genetske srodnosti sorata. Mikrosatelitne sekvence se uobičajeno sastoje od pet do oko 100 tandemskih ponavljanja kratkih jednostavnih motiva koji se sastoje od 1 do 6 nukleotida (Sefc i sur. 2009.). Bogatstvo mikrosatelitnih sekvenci kod eukariota čini ih gotovo neograničenim izvorom polimorfizma koji se može iskoristiti kao genetski markeri. Varijabilnost se utvrđuje na osnovu dužine mikrosatelita: sorte se razlikuju u broju parova mikrosatelitskih baza, a mogu biti heterozigoti ili homozigoti. ECPGR WG *Vitis* preporučuje najmanje devet ovih SSR markera za identifikaciju sorata i oni postaju standardni u ampelografiji.

Agronomski i prehrambeno – tehnološki fakultet Sveučuilišta u Mostaru u suradnji s Agronomskoim fakultetom Sveučilišta u Zagrebu profilirao je većinu sorata vinove loze u Hercegovini koristeći navedene SSR markere. Procijenjena je srodnost među sortama i izrađeni dendrogrami genetske sličnosti (Leko i sur., 2012.). Slijedeća faza

Since descriptions of vine parts and estimates of size, shape and proportion are open to subjective assessment of researchers, different measurements or ampelometric methods are introduced in order to achieve objective results. A methodology has been developed for measuring leaf area, length, width, depth of sinus, petiole length, and teeth size (Figure 78). This methodology is called ampelometry, while bunch and berry measuring is called uvometry. Measurements of bunch and berry include: mass, length, width, number and size of berries, mechanical analysis. All of this is aimed at simple and accurate identification and description of varieties. In ampelometry, computers and various specialized programs that operate based on photoanalysis and help standardize varietal descriptions are used today.

Figure 78 shows some of the points that we mark and on the basis of which the program calculates and displays descriptors.

One of the used programs is SuperAmpelo, developed by Microsoft Visual Studio.Net and compatible also with Microsoft Access Data Bases (Figure 78).

Molecular and genetic methods of variety identification

Classical phenotypic methods are not always sufficient because of the instability of morphological characteristics and environmental influences on them, also they are inapplicable in juvenile stages or of isolated plant parts (Tessier et al., 1999).

Therefore, identification for grape varieties is beginning first to make use of isoenzymes (Benin et al., 1988) and later molecular markers like RFLP, RAPD, SSR or microsatellites, AFLP, SNP.

Molecular and genetic methods are based on the analysis of variability in DNA sequence, for which numerous experiments have confirmed to be heritable and therefore not subjected to environmental influence. These methods are suitable for identification, since once confirmed DNA can be tested at any place and at any phase of the plant growth and development. They can be used as an addition to ampelography

ovih istraživanja biti će usporedba srodnosti i udaljenosti s drugim europskim i svjetskim sortama.

Klonska varijabilnost

Klon je individua dobivena od jedne ishodišne biljke vegetativno. Grupa klonova koja potječe od istog pretka je genetski identična ukoliko nije došlo do mutacija (Forneck 2005.). Klonovi se odabiru unutar kultivara, a pokazuju fenotipske ili fiziološke razlike. Klonska selekcija u Europi počela je u Njemačkoj još 1876, u Francuskoj 1946, a u Italiji 60-ih godina prošlog stoljeća.

Uslijed dugotrajnog vegetativnog umnažanja došlo je do akumulacije mutacija unutar pojedinih genotipova vinove loze, koji su počeli pokazivati fenotipske razlike. Javlja se klonska raznolikost koja može poslužiti u odabiru najboljih klonova unutar dane sorte (Carrier i sur. 2012.). Selekcija najboljih klonova komercijalno je opravdana jer daje bolji sadni materijal, bez mijenjanja identiteta kultivara koji su svjetski poznati (Carrier i sur. 2012.). Budući je popis kultivara dopuštenih za proizvodnja vina u EU ograničen, važno je ostati unutar prepoznatljivih okvira genotipa. Konvencionalno su se klonovi razlikovali morfološki i fenološki, ali su ove tehnike dostigle svoja ograničenja jer su subjektivne, nejasne, dugotrajne, pod utjecajem okolinskih čimbenika (Stajner i sur. 2009.). Razlikovanje klonova nije uvijek moguće metodama koje se koriste za kultuvare: ampelografski opisi i mirosatelitni markeri (SSR). SSR markeri su uspješni, a danas i rutinski u primjeni za identifikaciju i opis kultivara, međutim nisu dobar alat za analizu klonova određenog kultivara (Imazio i sur. 2006.).

Za najpoznatije hercegovačke sorte Žilavku, Blatinu i Krkošiju često se navode klonovi u proizvodnji i na tržištu među proizvođačima. Uz sortu Žilavka vežu se žuta žilavka, zelena, katkad broćanska i stara Žilavka, te različiti klonovi (Tarailo, 1991.). Blatinu opisuju kao stara Blatina i Blatina. Za sortu Krkošija vežu se Krkošija šupljica, ptičarka, biserka, bijela. Iako su rađena istraživanja na klonovima ovih sorata niti jedan klon nije priznat.

or independently. Today, molecular methods have become a common tool in identification, determination of relatedness and wine grape breeding.

SSR or microsatellite markers are most often applied in grapevines and they allow identification of varieties and rootstocks, reconstruction of origins of varieties and genetic relatedness. The typical microsatellite sequence consists of five to about one hundred tandem repeats of short, simple sequence motives composed of 1 to 6 nucleotides (Sefc et al. 2009).

The abundance of microsatellite sequences in eukaryote creates an almost unlimited source of polymorphic sites that may be exploited as genetic markers. Variability is detected by the allele size differences in base pairs. Data obtained from one individual represent the microsatellite profile of that cultivar. ECPGR WG *Vitis* recommends at least nine of these SSR markers for identification of varieties and they are becoming standard in ampelography.

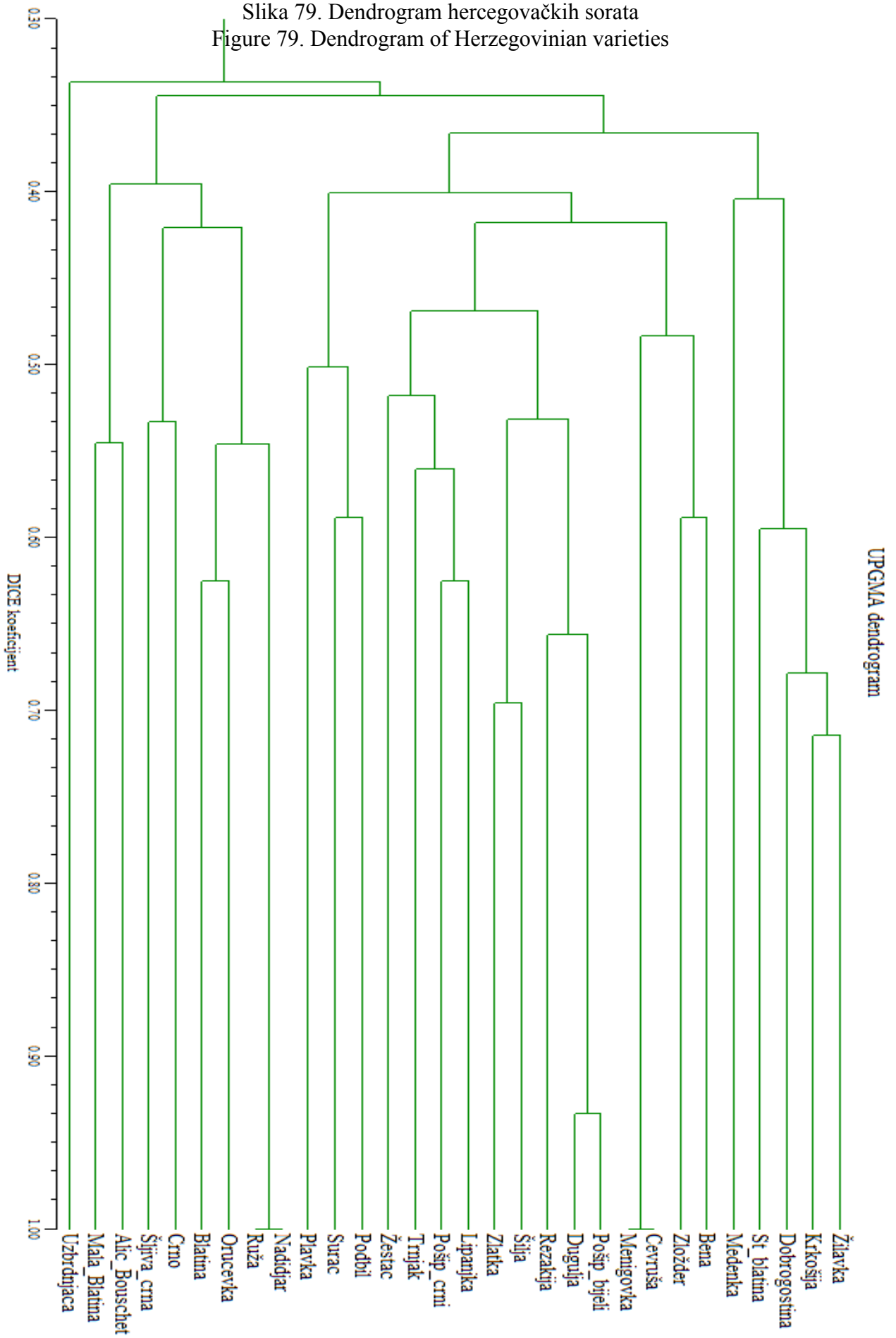
The Faculty of Agriculture and Food Technology, University of Mostar, in cooperation with Faculty of Agriculture, University of Zagreb, has profiled most of the vine varieties in Herzegovina using the said SSR markers. Relationship among varieties has been assessed and similarity dendrogram created. The next stage will be comparison of similarities and distances with other European and world varieties.

Clonal variability

A clone is defined as an individual that descended from a single common ancestor by asexual propagation. A group of clones originating from the same ancestor is defined to be genetically identical except for the effect of mutations (Forneck 2005). Clones are selected within the cultivar. Those are individuals with phenotypical or physiological differences. Selection of clones started in Germany in 1876, in France in 1946 and in 60s in Italy.

Long-term vegetative propagation resulted in accumulation of mutations within individual grapevine genotypes, which started manifesting phenotypic differences. This diversity can then be

Slika 79. Dendrogram hercegovačkih sorata
Figure 79. Dendrogram of Herzegovinian varieties



Inventarizacija i čuvanje sorata vinove loze

O ugroženosti životinjskih i biljnih vrsta te izumiranju odnosno nestajanju istih slušamo gotovo svakodnevno ne samo u medijima već i u svakodnevnom razgovoru ljudi. Izrazi poput biološka raznolikost, biološka ranjivost postaju opće poznati. Intenzivna poljoprivreda, prirodna i umjetna selekcija dovele su do suženja agrobioraznolikosti odnosno raznolikosti sorata i populacija unutar jedne vrste. Posebno su ugrožene stare lokalne ili katkad nazvane domaće sorte, ekotipovi i populacije čije se sjeme i sadni materijal komercijalno ne proizvode i ne distribuiraju. Jednom izgubljena sorta ne može se rekonstruirati. Stoga se radi na očuvanju ili održavanju sorata i populacija kroz njihov pronalazak, opis, uzimanje sjemena ili reznica, te čuvanje u posebnim uvjetima bilo u klima komorama ili u poljskim kolekcijama drvenastih vrsta. Takve kolekcije sjemena i sadnoga materijala ne obuhvaćaju samo stare ugrožene sorte već i komercijalne sorte trenutačno u uzgoju ili korištene za stvaranje novih materijala.

U svijetu djeluju različite organizacije, potpisuju se međunarodne konvencije, a gotovo svaka država ima svoje propise i kolekcije za čuvanje i održavanje biljnih genetskih izvora. Podaci kolekcija trebaju biti javni, dostupni u znanstvene i stručne svrhe, uz mogućnost korištenja i razmjene materijala u svrhe unapređenja, čuvanja, održavanja, širenja i iskorištavanja biljne raznolikosti. Ugroženost vrsta i sorata unutar roda *Vitis* prepoznali su još 70-ih godina prošloga stoljeća stručnjaci OIV-a i IBPGRI-a, te skrenuli pozornost na hitnost stvaranja kolekcija te neophodnost međunarodne suradnje u njihovom opisu, procjeni i slobodnoj razmjeni materijala (Detteweiler, 1990). Ovo prihvaćaju instituti, fakulteti, znanstvene i stručne organizacije te zasnivaju kolekcijske nasade vinove loze, radeći na opisu i standardizaciji opisa sorata. Zahvaljujući tim naporima danas je dostupan međunarodni katalog sorata i vrsta roda *Vitis*, koji se može od 1996. pregledati i pratiti na internetu (Vitis International Variety Catalogue (VIVIC) http://www.vivc.de/). Kasnije je pokrenuta i Europska baza podataka za *Vitis* vrste (European Vitis Database, ECVD, http://www.eu-vitis.de/index.php) koja donosi korisne informacije kako used to select the best clones within a given variety (Carrier et al. 2012). Selection of the best clones for commercial purpose is the only solution to access a plant diversity without modifying the identity of cultivars with worldwide repute (Carrier et al. 2012). List of wine cultivars in the European Union is restricted, it is important to stay within cultivar integrity. Conventional clonal identification was mainly based on morphological and phenological traits, but those techniques have reached their limits since they were subjective, difficult, time consuming, under influence of environmental factors (Stajner et al. 2009). Methods used for cultivar differentiation: ampelography and SSR molecular markers have not been always suitable to distinguish clones. SSR analysis, powerful tool for variety characterization, routinely used today, is not as effective to discover genetic differences among grapevine clones (Imazio et al. 2006).

Among producers as well as on the market, it is often referred to clones of famous Herzegovinian varieties Zilavka, Blatina and Krkosija. Associated with the Zilavka variety are zilavka zuta (yellow zilavka), zilavka zelena (green), and sometimes brocanska (Brotnjo) zilavka and old zilavka, and diferent clones (Tarailo, 1991.). Blatina is described as old Blatina and Blatina. The Krkosija variety is considered to have four clones: supljica (the one with many holes due to bad fertilization), pticarka, biserka, bijela (white). Although research was done on clones of these varieties, there were no officially recognized clones.

Inventory and maintenance of grape varieties

It is almost daily that we can hear about animal and plant species being endangered and becoming extinct or gone, not only in the media but also in everyday conversation. Terms such as biodiversity or biological vulnerability become generally known. Intensive agriculture, natural and artificial selection have led to a narrowing of the so-called agro-biodiversity, i.e. the diversity of varieties and populations within one species. PParticularly vulnerable are old local varieties, ecotypes and populations whose seeds and planting materials are not commercially produced and distributed. A variety, once lost, cannot be reconstructed. Therefore, efforts are being made

opisati sorte, koje deskriptore koristiti, popis institucija koje danas imaju kolekcije u Europi i njihov kontakt, upute za korištenje baze. Baza nudi nekoliko opcija pretraživanja ovisno od potreba pretraživača te njihovu kombinaciju. Europska baza je u 2012. sadržavala više podataka od međunarodne baze (Maul, 2012.). Prema stanju u travnju 2012. u bazi je bilo ukupno 31.856 primki (uzoraka). Za njih 9.944 potvrđeno je kako po svojstvima odgovaraju sorti odnosno da se doista radi o navedenoj sorti, a u bazi je bilo 1.489 jedinstvenih primki.

Istodobno je kreiran i pretraživi katalog poljskih kolekcija vinove loze u Europi, nazvan EURISCO (European Internet Search Catalogue – Europski katalog pretraživ internetom, http://eurisco.ecpgr.org) kao dio projekta EPGRIS financiran iz europskih fondova. Baza i EURISCO koriste FAO/Bioversity Multi-Crop Passport Descriptors (MCPD V.2), koji je međunarodni standard za upravljanje germplazmom i razmjenu podataka (Maul i sur., 2012.). Za opis i ocjenu primki koristi se 48 deskriptora s OIV-popisa za vinovu lozu (OIV 2009). Posebni su deskriptori kreirani za ocjenu ugroženih i zaboravljenih sorata kod vinogradara u manjim vinogradima ili uz okućnice. Oni uz opći opis sorte obuhvaćaju opis vinograda, morfološka, agronomska i enološka svojstva te rezultate javnoga testiranja vina (Maul i sur., 2012.)

Europski program za upravljanje genetskim izvorima i očuvanje vinove loze obuhvaća i inventarizaciju populacija divlje lozice *V. vinifera* subsp. *sylvestris*. U osam država: Austrija, Francuska, Gruzija, Italija, Njemačka, Portugal, Slovačka, Španjolska nađene su, obilježene, te zapisane GPS-kote za 189 lokacija, uz prosjek od 8,2 biljke po lokaciji.

Bosna i Hercegovina se uključuje u navedene programe. Ipak u europskoj bazi nema registrirana još uvijek ni jedna kolekcija iz naše države, dok su zastupljene neke od sorata koje se čuvaju po kolekcijama u Europi.

Važno je za budućnost vinogradarstva u Bosni i Hercegovini zasnovati ampelografsku kolekciju postojećih autohtonih i udomaćenih sorata kao osnovu za pouzdanu identifikaciju i evaluaciju, te sustavnu zaštitu od daljnje erozije germplazme,

to preserve or maintain varieties and populations by identifying and describing them, taking seeds or cuttings, and preserving them in special conditions, whether in air conditioned rooms or in field collections of woody species. These collections of seeds and planting materials do not include only old endangered varieties but also commercial varieties currently in cultivation or used to create new materials.

Different organizations act in the world, international conventions are being signed, and nearly every state has its own regulations and collections for preservation and maintenance of plant genetic resources. Data of the collections should be public, available for scientific and professional purposes, with the option to use and exchange the materials for the purposes of utilization, preserving, maintaining, spreading and managing of plant biodiversity. Experts of OIV and IBPGR recognized the vulnerability of species and varieties within the genus *Vitis* back in 1970s, and drew attention to the urgency of creating collections and necessity of international cooperation in their description, assessment and free exchange of materials (Detteweiler, 1990). This was embraced by institutes, universities, and scientific and professional organizations, so they established collection plantations of vines, working on specification and standardization of varietal descriptions. The international catalog of varieties and species of the genus Vitis is now publicly available thanks to these efforts, and it can be visited and followed up online since 1996 (Vitis International Variety Catalogue (VIVC) http://www.vivc.de/). European database for *Vitis* species (European Vitis Database ECVD http://www.eu-vitis.de/index.php) was launched afterwards and it brings useful information on how to describe species, which descriptors to use, lists of institutions that presently have collections in Europe and their contact information, as well as instructions for use of the database. The database offers several search options and their combinations depending on needs of researchers. In 2012, the European database contained more data than the international database (Maul, 2012). As of April 2012, the base contained 31,856 accessions (samples), 9,944 were confirmed to be true to type and 1,489 were unique accessions.

ali i kao podlogu za zasnivanje kvalitetnih matičnih nasada. Nužno je raditi na sustavnom opisu sorata prema odgovarajućim deskriptorima, pripadnosti sorata, koristiti molekularne markere u identifikaciji, rekonstrukciji podrijetla, utvrđivanju pripadnosti nekoj sorti, kreirati baze podataka postojećih materijala. Agronomski i prehrambeno-tehnološki fakultet Sveučilišta u Mostaru, podigao je kolekciju autohtonih i udomaćenih sorata vinove loze koje se uzgajaju u Hercegovini. Svi materijali prikupljeni su na jednom mjestu kako bi se kod opisa sorata izbjegao utjecaj okoline na izražavanje svojstava. Radi se na ampelografkom opisu sorata, a sve su i profilirane SSR- markerima. Kolekcija ima cilj očuvanja genfonda vinove loze Hercegovine. Sorte su zastupljene s po pet trsova u četiri ponavljanja raspoređene po slučajnom bloknom rasporedu što omogućuje različite istraživačke pokuse. Usto što kolekcija predstavlja banku gena vinove loze, njezina je namjena i znanstveno-istraživačka, te edukacijska za studente fakulteta koji rade diplomske i završne radove.

U Bosni i Hercegovini postoje dvije institucije koje se bave čuvanjem i održavanjem biljnih genetskih resursa, što podrazumijeva i čuvanje i održavanje autohtonih sorata vinove loze. Državno ministarstvo za vanjsku trgovinu i ekonomske odnose je 2004. godine imenovalo Poljoprivredni fakultet Sarajevo kao nositelja aktivnosti prikupljanja, čuvanja i održavanja biljnih genetskih resursa u Federaciji BiH, a 2008. godine osnovan je Centar za biljne genetske resurse na Butmiru, kao institucija koja brine o održavanju biljnih genetskih resursa. U Republici Srpskoj 2009. godine osnovan je Institut za genetičke resurse na Univerzitetu u Banjoj Luci kao profesionalna jedinica za koordinaciju provođenja Programa u oblasti čuvanja biljnih genetičkih resursa. Jedan od zadataka ovih institucija je sakupljanje, čuvanje i održivo korištenje autohtonih sorata vinove loze. Kolekcijski nasad autohtonih sorata vinove loze u Rodoču kod Mostara može biti banka gena i na federalnoj i na državnoj razini. Institut za genetičke resurse Republike Srpske je u 2014. godini uspostavio kolekcijski nasad vinove loze na području Trebinja u kojemu će se također, za potrebe Republike Srpske održavati autohtone sorte vinove loze.

A searchable catalogue of field collections of vines in Europe, called EURISCO (European Internet Search Catalogue - http://eurisco.ecpgr.org) was created at the same time as part of the EPGRIS project financed from the EU funds. The base and EURISCO use FAO/Bioversity Multi-Crop Passport Descriptors (MCPD V.2), which is the international standard for germplasm management and data exchange (Maul et al., 2012). Forty-eight descriptors from the OIV vine list are used for describing and assessing the accessions (OIV 2009). Special descriptors are created for assessing vulnerable and forgotten varieties with growers in smaller vineyards or in backyards. In addition to general description of the variety, they include description of the vineyard, morphological, agronomic and oenological properties and results of public wine testing (Maul et al., 2012.)

European program for management of genetic resources and conservation of vines also includes the inventory of populations of the wild vine *V. vinifera sylvestris*. In eight countries (Austria, France, Georgia, Italy, Germany, Portugal, Slovakia, and Spain) GPS coordinates of 189 sites have been found and marked, and recorded, with an average of 8.2 plants per site.

Bosnia and Herzegovina is getting involved in these programs. However, there is not a single collection from our country registered in the European base yet, while some of the varieties that are kept in collections in Europe are present.

It is important for the future of viticulture in Bosnia and Herzegovina to establish an ampelographic collection of existing autochthonous and domesticated varieties as a basis for reliable identification and evaluation, and systematic protection against further erosion of germplasm, but also as a basis for establishing high-quality mother plantations; to work on systematic description of varieties according to appropriate descriptors, classification of varieties, to use molecular markers in identification, reconstruction of origin, determination of affiliation with variety, to create databases of existing materials. The Faculty of Agriculture and Food Technology, University of Mostar, has established its collection of autochthonous and domesticated grape varieties that are grown in Herzegovina. All

Podloge vinove loze

Mladen Gašpar

Uzgoj vinove loze s aspekta podizanja nasada na prostoru Europe kronološki možemo podijeliti na dva razdoblja u kojima prijelomnu točku čini pojava filoksere (*Phylloxsera vastatrix* – trsov ušenac). Do pojave filoksere domaća (europska) vinova loza uzgajala se na vlastitom korijenu. Razmnožavala se vegetativno, zrelim reznicama sadnjom na stalno mjesto ili ožiljenim zrelim reznicama-korjenjacima uzgojenim u rasadnicima.



Slika 80. Cijepljenje (kalemljenje, navrćanje)
Figure 80. Grafting

the materials are collected at one place in order to avoid environmental effects on the determination of properties in describing varieties. Work on ampelographic description of varieties is under way, and they are all also profiled using SSR markers. The collection is aimed at preserving the genetic fund of vines of Herzegovina. Varieties are represented with five vines in four replications each, distributed in a randomized block design that allows experiments. In addition to being a gene bank of vines, the collection also has scientific and research purposes, as well as educational purposes for faculty students who prepare graduation and final theses.

In Bosnia and Herzegovina there are two institutions that deal with preservation and maintaining of plant genetic resources, which includes preservation and maintaining of autochthonous grape varieties. In 2004, the State Ministry of Foreign Trade and Economic Relations appointed the Faculty of Agriculture in Sarajevo as the principal body in charge of activities of collecting, storing and maintaining plant genetic resources in the Federation of BiH, and in 2008 the Center for Plant Genetic Resources was founded in Butmir as an institution responsible for maintaining plant genetic resources. In the Republic of Srpska, Institute for Genetic Resources was established in 2009 at the University of Banja Luka as a professional unit for coordination of implementation of programs in the field of preservation of plant genetic resources. The collection plantation of autochthonous grape varieties in Rodoč near Mostar can be a gene bank at both the federal and state level. In 2014, the Institute of Genetic Resources of the Republic of Srpska established a collection plantation of grapevines in Trebinje, in which autochthonous vine varieties will also be maintained for the needs of the Republic of Srpska.

Grapevine rootstocks

Mladen Gaspar

In terms of plantations in the territory of Europe, cultivation of vines can be chronologically divided into two periods in which the emergence

Filoksera je parazitirajući na korijenu domaće vinove loze, uništila krajem 19. i početkom 20. stoljeća europsko vinogradarstvo i promijenila način proizvodnje sadnoga materijala. Počelo se cijepiti (kalemiti, navrtati) na američke loze koje su otporne na filokseru i koje su kao takve preuzele ulogu korijena vinove loze. Rješavanjem problema s filokserom na opisani način uočili su se drugi problemi povezani kombiniranjem američke i europske loze, kao što su prilagođenost različitim uvjetima ekosustava što u konačnici postiže veću ili manju kakvoću grožđa, odnosno, vina.

Nakon toga je počela introdukcija, hibridizacija i selekcija unutar američkih vrsta loze u cilju pronalaska najpogodnijih podloga za određene ekološke uvjete. U svim vinogradarskim područjima nicali su nasadi američkih loza (matičnjaci, loznjaci) i razvijala se proizvodnja cijepova u rasadnicima. Kod nas su se prvi rasadnici osnovali početkom 20. stoljeća.

of phylloxera (*Phylloxsera vastatrix*) makes a turning point. Until the appearance of phylloxera, domestic (European) vines were grown on their own roots. They were reproduced vegetatively, by planting mature cuttings in a fixed place or by rooted mature cuttings grown in nurseries.

By its parasitism on roots of the local grapevines, in the late 19th and early 20th century phylloxera destroyed European viticulture and changed the production method of planting material. They began grafting onto American vines that are resistant to phylloxera and as such have taken over the role of grapevine roots. In solving the problems of phylloxera in the described manner, other problems associated with combining the American and European vines were identified, such as adaptation to different conditions of the ecosystem which finally results in a higher or lower quality of grapes or wines.

Introduction, hybridization and selection within the American vine species was then begun with



Slika 81. Sadnja loze
Figure 81. Planting of grapevine

Bitna svojstva podloga

Nakon međusobnih križanja američkih vrsta kao i križanaca američkih i europskih sorata vinove loze, te kompleksnih križanaca, stvorene su brojne podloge vinove loze koje su i danas u upotrebi. Selekcija podloga se nije samo zaustavila na otpornosti prema filokseri, nego su nastavljena istraživanja prema brojnim drugim ciljevima kao što su: tolerantnost na fiziološki aktivno vapno, usvajanje hranjiva, lakše ukorjenjivanje, tolerantnost na sušu, otpornost na nematode.

U izboru su podloga moguće i velike greške ako se vrijednost i osobine podloga prije ne ispitaju. Tipičan je primjer propadanje podloge Aramon x Rupestris Ganzin br. 1, koja je u Dalmaciji u prvoj obnovi vinograda primijenjena na 60 % trsova. Po uzoru je na Dalmaciju i u Hercegovini u prvoj obnovi ta podloga korištena u 25 % cijepova. Ta je podloga pokazivala veoma dobru kompatibilnost s gotovo svim sortama plemenite loze, imala je jak korjenov sustav, pa je bila bujna. Zahvaljujući tim svojstvima u potpunosti je zadovoljila zahtjeve vinogradara i masovno se počela primjenjivati u obnovi vinograda. Međutim uskoro se otkrilo da ta podloga nije u potpunosti otporna i loza na njoj nakon stanovitog vremena propada. Stoga je od 1931. godine ta podloga potpuno napuštena (Čečuk, 1955.), a primjenjuju se druge podloge koje su ispitane za točno određena tla i lokalitete, a otporne su na filokseru.

Glavni izvori otpornosti na filokseru su vrste: *Vitis riparia, Vitis rupestris, Vitis berlandieri*, a najbolje su podloge danas uglavnom hibridi navedenih vrsta, križanci s *Vitis vinifera* i kompleksni križanci.

Svojstva su koja lozna podloga mora zadovoljavati:

- visoka otpornost na filokseru i nematode,
- tolerantnost na visoki sadržaj vapna i soli u tlu,
- prilagodljivost na ekološke uvjete (klima, tlo),
- dobro srastanje s različitim sortama - kompatibilnost,
- dobra sposobnost ukorjenjivanja,
- tolerantnost na deficit minerala (kalij, magnezija, cink),

the aim of finding the most suitable rootstocks for particular environmental conditions. Plantations of American vines were springing up in all wine-growing areas and production of grafts in nurseries was developing. First nurseries in our area were established early in the 20th century.

Important characteristics of rootstocks

Interbreeding of American species as well as hybrids of American and European grapevine varieties, and complex hybrids, resulted in numerous grapevine rootstocks that are still in use today. Selection of rootstocks did not end only in resistance to phylloxera, but the research continued to a number of other objectives such as tolerance to physiologically active lime, nutrient uptake, easier rooting, drought tolerance, resistance to nematodes.

In selection of rootstocks, even big mistakes are possible if values and properties of rootstocks are not previously examined. A typical example is degradation of the rootstock Aramon x Rupestris Ganzin no. 1, which was applied to 60% of vines in Dalmatia in the first renewal of vineyards. Following the example of Dalmatia, this rootstock was used in 25% of grafts in the first renewal in Herzegovina. This rootstock demonstrated a very good compatibility with almost all varieties of cultivated vines, it had a strong root system, so it was vigorous. Thanks to these characteristics it fully satisfied requirements of winegrowers and its massive use started in renewal of vineyards. But soon it was discovered that this rootstock was not entirely resistant and vines on it degrade after a certain time. Therefore, this rootstock was completely abandoned since 1931 (McCarty, 1955), and other rootstocks are used, which have been tested on specific soils and sites, and are resistant to phylloxera.

The main sources of resistance to phylloxera are the species: *Vitis riparia, Vitis rupestris, Vitis berlandieri*, and the best rootstocks today are mainly hybrids of the above species, hybrids with *Vitis vinifera* and complex hybrids.

Characteristics that a rootstock must satisfy are:

- high resistance to phylloxera and nematodes;

- otpornost na bolesti i štetnike,
- velika produkcija mase za cijepljenje bez puno zahvata.

U posljednje vrijeme dosta pozornosti posvećuje se otpornosti podloga na nematode i viruse. Glavni je izvor oplemenjivačkoga rada u tom smjeru vrsta *Vitis champinii*.

Prikazat ćemo najvažnije podloge vinove loze u svijetu i u nas. Podijeljene su u četiri velike skupine:

- američke vrste roda *Vitis* i njihove selekcije,
- američko-američki križanci,
- europsko-američki križanci,
- složeni (kompleksni) križanci.

Opis podloga

Podloge iz križanja *Vitis berlandieri* x V*itis riparia*

420, A Millardet et de Grasset

Kober 5 BB

SO4, Oppenheim 4

Teleki 5 C

Teleki 8 B

Kober 125, AA

161-49, Couderc

157-11, Couderc

34 EM, Ecole de Montpellier

225, Ruggeri

Podloge iz križanja *Vitis berlandieri* x V*itis rupestris*

99, Richter

110, Richter

1103, Paulsen

140, Ruggeri

57, Richter

- tolerance to high contents of lime and salt in soil;
- adaptability to environmental conditions (climate, soil);
- good fusion with different varieties - compatibility;
- good rooting capability;
- tolerance to mineral deficits (potassium, magnesium, zinc);
- resistance to pests and diseases;
- high production of grafting mass without much intervention;

Recently, much consideration is paid to resistance of rootstocks to nematodes and viruses. The main source of breeding work in this direction is the species *Vitis champinii*.

Here we provide a review of the most important rootstocks of grapevines in the world and in our area. They are divided into four large groups:

- American species of the genus *Vitis* and their selections,
- American-American hybrids,
- European-American hybrids,
- complex hybrids

Description of rootstocks

Rootstocks from cross-breeding *Vitis berlandieri* x V*itis riparia*

420, A Millardet et de Grasset

Kober 5 BB

SO4, Oppenheim 4

Teleki 5 C

Teleki 8 B

Kober 125, AA

161 – 49, Couderc

157 – 11, Couderc

34 EM, Ecole de Montpellier

225, Ruggeri

770, Paulsen

775, Paulsen

779, Paulsen

1447, Paulsen

17-37, Millardet et de Grasset

Podloge iz križanja *Vitis riparia* x V*itis rupestris*

101-14, Millardet et de Grasset

3309, Couderc

3306, Couderc

Schwarzmann

Podloge iz križanja *Vitis vinifera* x V*itis berlandieri*

41 B, Millardet et de Grasset (križanac C*hasselas* x *V. berlandieri*)

333 EM, Ecole de Montpellier (križanac *Cabernet Sauvignon* x *V. berlandieri*)

Kompleksni križanci

1616, Couderc (križanac *V. solonis* x *V. riparia*)

Fercal, (križanac (*V. berlandieri* x *Colombard*) x 333 EM)

Osim navedenih podloga koje se danas koriste kod nas i u svijetu (oko 20 podloga) osvrnuti ćemo se na nekoliko najvažnijih u našim uvjetima.

Skupina *Vitis berlandieri* x V*itis riparia*

Podloge iz te skupine imaju dobru kompatibilnost i dobro ukorjenjivanje. Podnose 16 – 25 % fiziološki aktivna vapna i 30 – 50 % ukupna vapna. Različite su bujnosti ovisno o kultivarima. Utječe na redovite prirode i na dobro dozrijevanje grožđa. Imaju različite zahtjeve prema tlu.

Kober 5 BB – Podloga koja je izdvojena selekcijom iz potomstva podloge Teleki 5a u Nussbergu (Austrija) 1920. U mnogim je zemljama smatraju univerzalnom podlogom, a i kod nas je do nedavno bila zastupljena iznad

Rootstocks from cross-breeding *Vitis berlandieri* x V*itis rupestris*

99, Richter

110, Richter

1103, Paulsen

140, Ruggeri

57, Richter

770, Paulsen

775, Paulsen

779, Paulsen

1447, Paulsen

17-37, Millardet et de Grasset

Rootstocks from cross-breeding *Vitis riparia* x V*itis rupestris*

101 – 14, Millardet et de Grasset

3309, Couderc

3306, Couderc

Schwarzmann

Rootstocks from cross-breeding *Vitis vinifera* x V*itis berlandieri*

41 B, Millardet et de Grasset (hybrid Chasselas x V.*berlandieri*)

333 EM, Ecole de Montpellier (hybrid Cabernet Sauvignon x V.*berlandieri*)

Complex hybrids

1616, Couderc (hybrid V.*solonis* x V.*riparia*)

Fercal, (hybrid (V.*berlandieri* x Colombard) x 333 EM)

In addition to the above mentioned rootstocks that have been used today in our country and in the world (about 20 rootstocks), we will take note of several most important ones in our conditions.

Group *Vitis berlandieri* x V*itis riparia*

Rootstocks from this group have a good

95 %. Dosta je bujna, dobro podnosi fiziološki aktivno vapno (do 20 %) te ukupno vapno (60 %). Dobro podnosi podvodna tla, kompatibilna je s većinom sorata vinove loze i odlično se ukorjenjuje, stolne sorte na toj podlozi redovito i obilno rađaju. Ima kratak vegetacijski ciklus, pa je povoljna za sjevernije krajeve. Razvija veliki broj mladica i zaperaka. Dobra adaptacija prema različitim tipovima tala. Osjetljiva je na sušu. Jako je otporna na nematode. Sklona je osipanju cvjetova uz jaku gnojidbu dušikom. Dobro usvaja fosfor iz tla, srednje usvajanje kalija i magnezija. Ne treba je u našim uvjetima (Hercegovina) više prihvaćati kao univerzalnom jer postoje i druge podloge koje su boljih svojstava za neke naše terene (za suha, kamenita i škrta tla nije).

161-49 Couderc – Nastala je u Aubenasu (Francuska) 1888. U proizvodnju je uvedena 1939. Kod nas je slabo zastupljena. Ne podnosi sušu i osjetljiva je na nematode. Vrlo je bujna podloga, s dobrim dozrijevanjem drveta i s pozitivnim utjecajem na prirod i kakvoću grožđa. Podnosi do 25 % fiziološki aktivna vapna i do 50 % ukupna vapna u tlu. Srednje usvaja fosfor i kalij, a dobro magnezij iz tla. U matičnjacima daje dobru produkciju reznica.

Teleki 4B-SO4 je selekcioniran u Oppenheimu (Njemačka) iz populacije Berlandieri x Riparia Teleki 4B. Rasprostranjena je u gotovo svim vinogradarskim zemljama svijeta. Ranijega je dozrijevanja drva i grožđa, čak i do dva tjedna prije Kobera 5 BB. Idealna je za hladnije

compatibility and good rooting. They tolerate 16 – 25% of physiologically active lime and 30 – 50% of total lime. Their vigor varies depending on cultivars. Lead to regular yields and good ripening of grapes. They have different soil requirement.

Kober 5 BB – The rootstock isolated by selection from the progeny of the rootstock Teleki 5a in Nussberg (Austria) in 1920. In many countries it is considered a universal rootstock, and in our region it was present more than 95% until recently. It is fairly vigorous and tolerates well physiologically active lime (up to 20%) and total lime (60%). It has a good tolerance to underwater soils, is compatible with most grape varieties and has excellent rooting, table varieties on this rootstock have regular and abundant cropping. It has a short vegetation cycle, so it is suitable for northern regions. It develops a large number of shoots and laterals. Good adjustment to various types of soils. Susceptible to drought. Very resistant to nematodes. Prone to fall of flowers with heavy nitrogen fertilization. Good uptake of phosphorus from soil, medium uptake of potassium and magnesium. It should no longer be accepted as universal in our conditions (Herzegovina) because there are other rootstocks that have better characteristics for some of our terrains (it is not for dry, rocky and poor soils).

161-49 Couderc - It was developed in Aubenas (France) in 1888. It was introduced in production in 1939. It is rarely found in our region. Does not tolerate drought and is susceptible to nematodes.





Slika 82. Rasadnik loznih podloga u Ravnom u vegetaciji i mirovanju
Figure 82 Nursery of grape rootstocks in Ravno in vegetation and dormancy

kontinentalne krajeve gdje ubrzava dozrijevanje grožđa, a i kod uzgoja stolnoga grožđa (ranija berba). Vrlo dobro utječe na nakupljanje šećera u moštu. Slabe je do srednje bujnosti. Prikladna je za guste sklopove sadnje, iznad 5000 trsova po hektaru. Vrlo je otporna na niske temperature. Razvija snažan i razgranat korjenov sustav. Jako je otporna na nematode. Osjetljiva je na sušu. Podnosi 17 – 18 % fiziološki aktivna vapna, te 40 – 45 % ukupna vapna. Dobroga je ukorjenjivanja i dobre kompatibilnost. Dobro usvaja fosfor iz tla, srednje kalij, a slabo magnezij.

Skupina *Vitis berlandieri* x *Vitis rupestris*

Podloge su iz te skupine jake bujnosti, dobro podnose sušu, a umjereno podnose vapno u tlu. Imaju dulje vegetacijsko razdoblje, te nisu prikladne za sjeverne krajeve i kasnije sorte. Podnose 16 – 30 % fiziološki aktivna vapna. Imaju dobro ukorjenjivanje.

Najbolje su se pokazale za tople krajeve, za suha kamenita i pjeskovita tla (Hercegovina, Dalmacija) i to Richter 109, Richter 110, Ruggeri 140 i 1103 Paulsen. Sve su te podloge zasađene u matičnjaku podloga Federalnoga agromediteranskog zavoda *Mostar* u Ravnom. Osim tih podloga u matičnjaku su zasađene još tri podloge: Kober 5 BB, 161-69 Couderc i 41B.

Richter 99 – Ta podloga podnosi do 17 % fiziološki aktivna vapna u tlu. Vrlo je bujna podloga, dobro podržava visoke i jake uzgojne oblike. Dobra je podloga za umjereno sušna pjeskovito-ilovasta, propusna, srednje bogata i umjereno vapnena tla. Srednje je otporna na sušu, vrlo je otporna na nematode, otporna na niske temperature. Ima dugu vegetaciju, ne podnosi vlažna tla. Ima nešto lošije ukorjenjivanje. Dobro usvaja fosfor i kalij iz tla, srednje magnezij.

110 Richter – Odlična je lozna podloga koja se dobro prilagođava gotovo svim tlima i položajima prikladnim za uzgoj grožđa. Slaže se dobro i sa stolnim sortama vinove loze i vrlo povoljno utječe na urod i kakvoću te nešto ranije dozrijevanje. Ta je podloga bujna, dobro podnosi sušu i aktivno vapno do 18 % te ukupno vapno do 40 %. Srednje je osjetljiva na nematode, a jako je osjetljiva na pretjeranu vlažnost tla. Ima bolje ukorjenjivanje od Richtera 99. Dobro usvaja fosfor i kalij iz tla,

A very vigorous rootstock, with good ripening of the tree and with positive effect on yield and quality of grapes. Tolerates up to 25% of physiologically active lime and up to 50% of total lime in soil. Medium uptake of phosphorus and potassium, and good uptake of magnesium from soil. In nurseries, it provides a good production of cuttings.

Teleki 4B - SO4 is selected in Oppenheim (Germany) from the population Berlandieri x Riparia Teleki 4B. Widespread in almost all wine-growing countries in the world. Its tree and grapes ripen earlier, even up to two weeks before Kober 5 BB. Ideal for colder continental areas, where it forces ripening of grapes, but also in breeding of table grapes (earlier harvest). It has a very good effect on accumulation of sugar in must. Its vigor is low to medium. Suitable for dense planting layouts, over 5000 vines per hectare. Very resistant to low temperatures. Develops a strong and widely spread root system. Very resistant to nematodes. Susceptible to drought. Tolerates 17-18% of physiologically active lime, and 40 – 45% total lime. Its rooting and compatibility are good. Good uptake of phosphorus from soil, medium of potassium, low uptake of magnesium.

Group *Vitis berlandieri* x *Vitis rupestris*

Rootstocks from this group have good vigor and tolerate drought well, and moderately tolerate lime in soil. They have a longer vegetation period and are not suitable for northern areas and later cultivars. Tolerate 16 – 30% of physiologically active lime. They have good rooting.

Proved to be the best for warm areas, for dry rocky and sandy soils (Herzegovina, Dalmatia), specifically Richter 109, Richter 110, Ruggeri 140 and 1103 Paulsen. All these rootstocks are planted in the rootstock nursery of the Federal Agromediterranean Institute Mostar in Ravno. In addition to these rootstocks, three other rootstocks are planted in the nursery: Kober 5BB, 161-69 Couderc and 41B.

Richter 99 – This rootstock tolerates up to 17% of physiologically active lime in soil. It is a very vigorous rootstock, and supports well high and strong growing forms. This rootstock is good for moderately dry sandy-clayey, permeable,

slabo magnezij. U posljednje je vrijeme smatraju jednom od najboljih podloga za suha, škrta i kamenita tla Dalmacije i Hercegovine.

1103 Paulsen – Vrlo je dobra lozna podloga kojoj odgovaraju srednje teška i teška tla, umjereno vapnena (20 – 35 % aktivna vapna, do 60 % ukupna vapna) pa i nešto vlažnija, ali ne pretjerano vlažna tla. Pokazuje dobar afinitet s raznim kultivarima, a osobito je dobra u vinogradima jakih uzgojnih oblika. Ta je podloga vrlo bujna i podnosi zaslanjena tla bolje od drugih. Ranije kreće i odlična je podloga za sredozemnu suhu klimu. Jedna je od boljih podloga za uzgoj stolnih sorata grožđa, pridonosi i ranijem dozrijevanju grožđa. Postotak ukorjenjivanja kreće se oko 50 %. U matičnjacima daje urod od 45 do 75.000 reznica prve klase. Dobro podnosi sušu i otporna je na nematode. Dobro usvaja fosfor i magnezij iz tla, srednje kalij.

140 Ruggeri – Veoma je pogodna podloga za manje plodna, suha kamenita i siromašna tla (Dalmacija i Hercegovina). Dobro se slaže s raznim kultivarima i na odgovarajućim terenima povoljno utječe na urod i kakvoću grožđa. Ta je podloga bujna, odlično podnosi vapneno tlo, prema pojedinim autorima 30 – 70 % ukupna vapna, vrlo dobro podnosi sušu, ali slabo podnosi vlagu u tlu. U matičnjaku urod reznica prve klase kreće se 60.000 – 80.000 cijepova prve klase. Dobro usvaja magnezij iz tla, fosfor srednje, a kalij slabo.

Skupina *Vitis riparia* x *Vitis rupestris*

Podloge iz te skupine od *V. riparia* naslijedile su dobro ožiljavanje, umjerenu bujnost i rodnost, a od *V. rupestris* otpornost na sušu i nešto vapna u tlu. Imaju dobru kompatibilnost i prikladne su za više tipova tla. Nedostatak im je niska podnošljivost vapna.

3309 C – Srednje je bujna podloga, odgovaraju joj plodna i svježa tla koja nemaju više od 10% aktivna vapna u tlu. Podnosi lagano zaslanjena tla, osjetljiva je na vlagu u tlu, nematode i sušu. Slabo usvaja fosfor i kalij iz tla, srednje magnezij.

101-14 Milllardet et de Grasset odlikuje se kratkom vegetacijom što doprinosi bržem dozrijevanju grožđa. Odgovaraju joj tla koja

medium rich and moderately limy soils. It is medium resistant to drought, very resistant to nematodes, resistant to low temperatures. It has a long vegetation period, does not tolerate wet soils. Its rooting is weaker. Good uptake of phosphorus and potassium from soil, medium uptake of magnesium.

110 Richter - Excellent vine rootstock that is well adapted to almost all soils and positions suitable for grape growing. It combines well with table grape varieties and has a very beneficial effect on yield and quality, as well as somewhat earlier ripening. This rootstock is vigorous, tolerates well drought and active lime up to 18% and total lime up to 40%. It is medium sensitive to nematodes, and very sensitive to excessive moisture of soil. It has better rooting than Richter 99. Good uptake of phosphorous and potassium from soil, low of magnesium. Recently considered as one of the best rootstocks for dry, poor and rocky soils of Dalmatia and Herzegovina.

1103 Paulsen - A very good vine rootstock that favors medium-heavy and heavy soils, moderately limy (up to 20 -35% of active lime, up to 60% of total lime) and also slightly wetter, but not excessively wet soils. Shows a good compatibility with various cultivars, and is especially good in vineyards with strong growing forms. This rootstock is very vigorous and tolerates saline soils better than others. It starts earlier and is an excellent rootstock for the dry Mediterranean climate. One of the better rootstocks for cultivation of table grape varieties, contributes also to earlier ripening of grapes. Rooting percentage is about 50%. In nurseries, it produces from 45,000 to 75,000 first-class cuttings. Tolerates drought well and is resistant to nematodes. Good uptake of phosphorus and magnesium from soil, low of potassium.

140 Ruggeri is a very suitable rootstock for less fertile, dry rocky and poor soils (Dalmatia and Herzegovina). Combines well with various cultivars and on adequate terrains has a favorable effect on yield and quality of grapes. This rootstock is vigorous, has an excellent tolerance to limy soil, according to some authors 30-70% of the total lime, very well tolerates drought but has a low tolerance to moisture in soil. In a nursery, production of first class cuttings ranges from

imaju manje od 10 % aktivna i do 20 % ukupna vapna. Daje dobre prinose reznica u matičnjaku i ima dobro ukorjenjivanje. U Hercegovini ta podloga nije zastupljena, ali je rasprostranjena u vinogradima Ukrinskog vinogorja oko Prnjavora u sjevernoj Bosni.

Skupina *Vitis vinifera* x *Vitis berlandieri*

U toj su skupini zastupljeni križanci europskih sorata vinove loze sa skupinom Berlandieri. Najvažnije su podloge iz te grupe **41 B** i **333 EM** poznate najviše po visokoj otpornosti na vapno u tlu.

Chasselas x ***Berlandieri 41 B*** – Podloga je srednje bujnosti kojoj odgovaraju plodna, umjereno vlažna tla. Podnosi do 40% fiziološki aktivna vapna i 70 – 75 % ukupna vapna. Nije pogodna za sušna, zaslanjena ni jako vlažna tla. Koristi se za jako kredna tla. Ukorjenjivanje je slabo. Primitak reznica i cijepova iznosi svega 30 – 35 % što dodatno poskupljuje proizvodnju. Osjetljiva je na nematode i srednje otporna na filokseru. U matičnjacima ju je potrebno štititi protiv peronospore. Urod reznica u matičnjacima je od 25 do 50.000 reznica prve klase. Dobro usvaja fosfor i magnezij iz tla, a slabo kalij.

Kompleksni križanci

Ta skupina obuhvaća lozne podloge koje su nastale križanjem između tri ili više roditelja, američkih vrsta, te plemenite loze.

1616 Couderc – Podnosi 0,8 ‰ NaCl, te 11 % aktivna vapna. Otporna je na nematode i tolerantna na vlažna i svježa tla.

Fercal – Najotpornija je podloga na vapno u tlu. Otporna je na nematode, ne podnosi suha tla. Dobro podnosi vlažna tla. Otpornija je na vapno 30 % u odnosu na 41 B, 140 R i 333 EM. Otporna na filokseru. Dobro usvaja fosfor i kalij iz tla, a srednje usvaja magnezij. Osjetljiva je na nedostatak magnezija.

U zaključku se može reći da su se podloge iz grupe križanaca *V. berlandi*eri x *V. rupestris* zadnjih dvadesetak godina posebno dobro pokazale na rekultiviranim kamenitim terenima na području Čitluka, Ljubuškog i Stoca. Podloge

60,000 to 80,000 first class grafts. Good uptake of magnesium from soil, medium of phosphorus, and low of potassium.

Group *Vitis riparia* x *Vitis rupestris*

Rootstocks of this group have inherited from *V. riparia* good rooting, moderate vigor and yield, and from *V. rupestris* resistance to drought and some lime in soil. They have good compatibility and are suitable for several types of soil. Their disadvantage is low tolerance to lime.

3309 C is a medium vigorous rootstock, suited for fertile and fresh soils that do not have more than 10% of active lime in soil. It tolerates lightly saline soils, sensitive to moisture in soil, nematodes and drought. Low uptake of phosphorus and potassium from soil, medium uptake of magnesium.

101-14 Milllardet et de Grasset is characterized by short vegetation, which facilitates sooner ripening of grapes. It favors soils that have less than 10% of active and up to 20% of total lime. It provides good yields of cuttings in nursery and has good rooting. This rootstock in not present in Herzegovina, but is widespread in vineyards of the Ukrina wine-growing region around Prnjavor in northern Bosnia.

Group *Vitis vinifera* x *Vitis berlandieri*

This group contains hybrids of European varieties of vine with the group *berlandieri*. The most important rootstocks of this group are **41 B** and **333 EM** mostly known for their resistance to lime in soil.

Chasselas x Berlandieri 41 B – Rootstock of a medium vigor that prefers fertile, moderately wet soils. It tolerates up to 40% of physiologically active lime and 70 - 75% of total lime. It is not sutable for dry, saline or very wet soils. Used for highly Cretaceous soils. Rooting is weak. Only 30-35% of cuttings and grafts take root, which additionally raise the production costs. It is sensitive to nematodes and medium resistant to phylloxera. In nurseries requires protection against peronospora. The production of cuttings in nurseries is from 25,000 to 50,000 of first-class cuttings. Good uptake of phosphorus

iz ove skupine su jake bujnosti, dobro podnose sušu, a umjereno podnose vapno u tlu (16 – 30% fiziološki aktivnog vapna), imaju duži vegetacijski period i dobro se ukorjenjuju u tlo. Među njima su se najboljima pokazale **Richter 110**, **Ruggeri 140** i **1103 Paulsen**. Sve ove podloge zasađene su u matičnjaku Federalnog agromediteranskog zavoda Mostar u Ravnom.

Podloga **Kober 5BB**, iz grupe križanaca *V. berlandieri x V. riparia* je također široko zastupljena u hercegovačkim vinogradima, dobra je podloga, ali je treba više koristiti na vlažnijim i dubljim tlima kraških polja i aluvijalnim tlima u dolinama rijeka. Ova podloga ne podnosi dobro sušu i manje plodna suha tla na kamenu. Na terenima gdje je visoko aktivno vapno vinograde treba uzgajati na europsko-američkom križancu **Chasselas** x **Berlandieri 41 B** koji podnosi do 40% aktivnog i 70% ukupnog vapna.



Slika 83. Sadnice vinove loze
Figure 83. Seedlings of grapevine

and magnesium from soil, and low uptake of potassium.

Complex hybrids

This group includes vine rootstocks developed by interbreeding three or more parents of American varieties of cultivated vines.

1616 Couderc tolerates 0,8‰ NaCl and 11% of active lime. It is resistant to nematodes and tolerant to wet and fresh soils.

Fercal is the most resistant rootstock to lime in soil. It is resistant to nematodes, and does not tolerate dry soils. Tolerates well wet soils. It is 30% more resistant to lime in relation to 41 B, 140 R and 333 EM. Resistant to phylloxera. Good uptake of phosphorus and potassium from soil, and medium uptake of magnesium. It is resistant to magnesium deficiency.

In the conclusion, it can be said that rootstocks from the hybrid group *V. berlandi*eri x *V. rupestris* have proven to be especially good in the last twenty years or so on reclaimed rocky terrains in the areas of Citluk, Ljubuski and Stolac. Rootstocks of this group have strong vigor, tolerate drought well and moderately tolerate lime in soil (16-30% of physiologically active lime), have longer vegetation period and have good rooting in soil. It was found that the best among them are **Richter 110**, **Ruggeri 140** and **1103 Paulsen**. All these rootstocks have been planted in the nursery of the Federal Agromediterranean Institute Mostar in Ravno.

Rootstock **Kober 5BB**, from the hybrid group *V. berlandieri x V. riparia* is also widely applied in Herzegovinian vineyards, it is a good rootstock, but it should be used more on wetter and deeper soils of karst fields and alluvial soils in river valleys. This rootstock does not tolerate well drought and less fertile dry soils on rock. On terrains of highly active lime, vineyards should be grown on the European-American hybrid **Chasselas** x **Berlandieri 41 B** which tolerates up to 40% of active and 70% of total lime.

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AMPELOGRAFSKE KARAKTERISTIKE HERCEGOVAČKIH SORATA

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Ampelografski opisi

U ovom poglavlju prikazat ćemo ampelografske karakteristike 30 sorata. Među njima su većim dijelom autohtone hercegovačke sorte, te neke sorte uvedene s drugih područja koje se u Hercegovini uzgajaju veoma dugo, prilagodile su se tom podneblju tako da se skoro smatraju domaćim sortama. Za 17 sorata dan je kratak opis najvažnijih svojstava. To su bijele sorte: Žilavka, Krkošija, Bena, Dobrogostina, Pošip bijeli, Zložder, Podbil i Šljiva bijela, te crne sorte: Blatina, Trnjak, Plavka, Pošip crni, Mala blatina, Surac, Šljiva crna. Osim toga prikazani su Alicante bouschet i Vranac kao sorte stranoga podrijetla koje se u znatnoj mjeri uzgajaju u Hercegovini. Ostalih 13 sorata prikazano je samo fotografijama i to: vrh mladice, list i grozd. To su dijelovi vinove loze koji se koriste u identifikaciji sorata.

Sorte za koje je dan i opis i fotografija su one koje su do sada manje ili više istražene, a ostale sorte bi tek trebalo istražiti i opisati što će biti moguće kada se dovoljno razviju u kolekcijskom nasadu Agronomskog i prehrambeno-tehnološkoga fakulteta Mostar. Za opis sorata korišteni su sljedeći izvori: Rejonizacija vinogradarstva SR BiH (Vuksanović i sur., 1977.), Atlas hrvatskog vinogradarstva i vinarstva (Mirošević i sur., 2009., Ampelografski atlas (Mirošević i Turković, 2003.), Dalmatinska ampelografija (Bulić, 1949.), te ampelografski opisi provedeni na Agronomskom fakultetu u Mostaru.

U posljednje se vrijeme u Hercegovini, a još više u Bosni, uzgajaju poznate europske sorte kao što su: Cardonnay, Riesling, Pinot blanc, Pinot noir, Cabernet Sauvignon, Syrah, Merlot, kao i neke hrvatske sorte poput Graševine i Plavca malog. Sve su te sorte riječima i fotografijom prikazane u drugim monografijama i mi ih, kao strane introducirane sorte, nećemo opisivati ili ćemo ih ostaviti za neke druge kataloge.

AMPELOGRAPHIC CHARACTERISTICS OF HERZEGOVINIAN VARIETIES

Jure Beljo, Ana Mandić, Marijo Leko, Goran Ćavar

Ampelographic descriptions

In this chapter, we will present ampelographic characteristics of 30 varieties. They mostly include autochthonous Herzegovinian varieties, and some varieties introduced from other areas that have been grown in Herzegovina for very long, and that have adapted to this climate so they are almost considered as domestic varieties. Brief descriptions of the most important characteristics are given for 17 varieties. These are the white varieties Zilavka, Krkosija, Bena, Dobrogostina, Posip bijeli, Zlozder, Podbil, and Sljiva bijela, and red varieties Blatina, Trnjak, Plavka, Posip crni, Mala blatina, Surac, and Sljiva crna. In addition, Alicante bouschet and Vranac are presented as varieties of foreign origin that are largely grown in Herzegovina. The other 13 varieties are presented only by pictures of shoot tops, leaves and bunches. These are the parts of grapevines used in identification of varieties.

The varieties presented by both text descriptions and pictures are the ones that have been more or less explored, and other varieties have yet to be explored and described. That will be possible when they are sufficiently developed in the collection plantation of the Faculty of Agriculture and Food Technology Mostar. The following sources were used for descriptions of the varieties: Viticulture Zoning in SR BiH (Vuksanović et al., 1977), Atlas of Croatian Viticulture and Winegrowing (Mirošević et al. 2009), Ampelographic Atlas (Mirošević and Turković, 2003), Dalmatian Ampelography (Bulić, 1949), and ampelographic descriptions conducted at the Faculty of Agriculture in Mostar.

Well-known European varieties, such as Cardonnay, Riesling, Pinot blanc, Pinot noir, Cabernet Sauvignon, Syrah, Merlot, as well as some Croatian varieties such as Grasevina and Plavac mali, have been recently grown in Herzegovina, and even more in Bosnia. All these varieties are presented in words and pictures in other monographs. As foreign introduced cultivars, they will not be described here and are left some other catalogs.

ŽILAVKA

Sinonimi: Žilavka mostarska

Podrijetlo: Žilavka je autohtona hercegovačka sorta.

Rasprostranjenost: Uzgaja se na cijelom vinogradarskom području Hercegovine, te manjim dijelom u Dalmaciji. U vrijeme bivše Jugoslavije uzgajana u Makedoniji i na Kosovu.

Botanička svojstva: Trs je bujan, vrh mladice je u potpunosti otvoren. Dlačice na vrhu mladice su srednje gustoće. Položaj mladice na trsu je uspravan.

List je srednje velik, kružna oblika i petodijelan. Liske peteljkinoga sinusa se preklapaju, ali ne u potpunosti. Baza peteljkinoga sinusa je u obliku slova V i nije ograničena nervaturom. Lice lista glatko i svijetlozelene boja, a naličje dlakavo blijedozeleno. Gornji postrani sinusi su srednje urezani. Peteljka debela, blijedo crvenkaste boje.

Cvijet je morfološki i funkcionalno hermafroditan. No ponekad se u cvijetu javljaju anomalije pri otvaranju i na takvim trsovima nema oplodnje, pa ih je dobro prekalemiti.

Bobica je srednje duga i srednje široka. Oblik bobice je sferni. Boja pokožice je zelenožuta, a na suncu zlatnožuta. Pokožica je žiličasta, pa otuda teorija da je sorta po tome dobila ime. U bobici su u prosjeku tri sjemenke i nisu u potpunosti razvijene.

Grozd je srednje veličine i srednje dužine. Peteljka je kratka. Grozd je piramidalna ili cilindrična oblika, dosta zbijen. Na grozdu se nalaze 1 – 2 krilca.

Gospodarsko-tehnološka svojstva: dozrijeva u III. epohi, pa je srednje kasna sorta. Oplodnja je normalna i redovita i prilično je prinosna sorta. Sadržaj šećera u moštu varira 19 – 24 %. Vino Žilavke je visoke kakvoće s izraženom aromom, zelenožute boje.

Unutarsortna varijabilnost: Klonovi u okviru te sorte za sada nisu izdvajani iako su zapažene razlike u morfološkim svojstvima. Postoje dva varijeteta koja se razlikuju po boji bobica, nazvani zelenka i žutka. Neki također spominju više različitih klonova. No tek analiza genetskih markera poput AFLP, S-SAP ili SNP može pokazati postoje li genetske razlike među varijetetima i klonovima.

ZILAVKA

Synonims: Zilavka mostarska

Origin: Zilavka is an autochthonous Herzegovinian variety.

Range: It is grown in the entire wine-growing area of Herzegovina, and to a lesser degree in Dalmatia. In was grown in Macedonia and Kosovo during the former Yugoslavia.

Botanical properties: Vine is vigorous, shoot top is fully open. Little hairs on top of shoot are medium dense. Position of shoot on vine is upright.

Leaf is medium large, of circular shape and five lobes. Blades of petiole sinus overlap, but not fully. Base of petiole sinus is V-shaped, but not limited by venation. Leaf face is smooth and light green in color, and its back side is pilose pale green. Upper side sinuses are medium indented. Petiole is thick, pale reddish in color.

Morphologically and functionally, flower is hermaphrodite. However, sometimes anomalies occur on flowers while opening, and on such vines there is no fertilization so it is good to graft them.

Berry is medium long and medium wide. The shape of berry is spherical. The color of skin is yellow green, and on sunlight golden yellow. Skin is finely veined (tiny veins), hence the theory that the variety was named after that. On the average, there are three seeds in a berry but they are not fully developed.

Bunch is medium sized and medium long. Petiole is short. Bunch has a pyramidal or cylindrical form, rather compact. There are 1 - 2 wings on a bunch.

Economic and technological properties: It ripens in the third epoch, so it is a medium late variety. Fertilization is normal and regular and it is a rather high-yielding variety. Sugar contents in must varies from 19 to 24%. Zilavka wine is a high-quality wine with distinct aroma, yellow green in color.

Intra-variety variability: Clones within this variety have not be extracted for now although differences in morphological properties are observed. There are two variations differing in berry colors named zelenka (green) and zutka (yellow). Some authors even wrote about more different clones. However, only the analysis of genetic markers such as AFLP, S-SAP or SNP may show whether there are genetic differences among clones.

ŽILAVKA









KRKOŠIJA

Sinonimi: Krkošija šupljica, Krkošija ptičarka. Postoje još sorte koje su nosile isti naziv poput Krkošije žute, Krkošije pirgave ili Biserke

Podrijetlo: Autohtona je sorta Hercegovine.

Rasprostranjenost: Raširena je u cijeloj Hercegovini, najviše oko Čitluka, Ljubuškog, Mostara, a u gornjoj Hercegovini je danas skoro nema iako je nekada oko Konjica bila veoma raširena. Širi se oko Trebinja, a ima je i u Dalmaciji.

Botanički opis: Trs je srednje bujan, vrh mladice je povijen u stranu, zelene je boje i blijedo dlakav. Jednogodišnja je mladica debela, rebrasta, glatka sa srednje dugim internodijima.

List je srednje velik, stožasta do okruglasta oblika, petodijelan do sedmodijelan, s dubokim urezima. Peteljkin sinus je također preklopljen. Lice lista je tamnozeleno, a naličje blijedozeleno. Zupci su srednje veličine i tupi. Peteljka lista je kratka i srednje debljine.

Cvijet je dvospolan, no katkad popraćen s pojavom anomalije u otvaranju cvjetne kapice u vidu zvjezdice, što doprinosi slabijoj oplodnji i zametanju bobice.

Grozd je srednje velik, zbijen ili katkad rastresit, stožasta oblika, sa srednje dugom peteljkom.

Bobica je okrugla, a ponekad malo sploštena. Pokožica žutozelena, osrednje debela, s mnogo smeđih točkica. Sok je bezbojan, vinasto-kiselkasta okusa.

Gospodarsko-tehnološka svojstva: dozrijeva u III. epohi kao i Žilavka. Oplodnja je neredovita zbog pojave anomalija u građi cvijeta. Nije sigurne rodnosti zbog smjese različitih tipova. Voli propusna tla dovoljno vlage kakve su crvenice Brotnja, Dubrava i oko Ljubuškog. Ne podnosi sušu i suviše mršava tla.

Sorta je veoma izdašna u količini šećera, a ima više kiselina od Žilavke. Daje vino zelenožute boje, s dosta alkohola, s dobrim ekstraktom, ali je bez arome. U čistom sortnom sastavu nije dobre kakvoće, ali se dobro kombinira sa Žilavkom.

Unutarsortna varijabilnost: Veoma je heterogena sorta, jer ima više tipova. No selekcija klonova nije provođena.

KRKOSIJA

Synonyms: Krkosija supljica, Krkosija pticarka; There are other varieties that had the same name like Krkosija zuta, Krkosija pirgava or Biserka.

Origin: It is an autochthonous variety of Herzegovina.

Range: It is spread throughout Herzegovina, mostly around Citluk, Ljubuski, Mostar, and today it can hardly be found in the Upper Herzegovina although it used to be widespread around Konjic. It is spreading around Trebinje, and can be found also in Dalmatia.

Botanical description: Vine is medium vigorous, shoot top is bent sideways, its color is green and it is pallidly pilose. Annual shoot is thick, ribbed, smooth with medium long internodes.

Leaf is medium large, of a conical to round shape, in five to seven lobes, with deep indentations. Petiole sinus is also overlapping. Leaf face is dark green, and the back side is pale green. Teeth are medium sized and blunt. Leaf petiole is short and medium thick.

Flower is bisexual, but sometimes accompanied by occurrence of an anomaly with the opening of star-like flower caps, which is responsible for inferior fertilization and fruit set of berries.

Bunch is medium large, compact or sometimes loose in conical form, with medium long stem.

Berry is round, and sometimes slightly flattened. Skin yellow green, medium thick, with many brown dots. Juice is colorless, with winey sourish taste.

Economic and technological properties: It ripens in the 3rd period like Zilavka. Fertilization is irregular due to occurrence of an anomaly in the structure of flower. Its yield is not certain because of the mixture of different types. It likes porous soils of sufficient moisture such as terra rossa soils of Brotnjo, Dubrava and around Ljubuski. It does not tolerate drought or too thin soils.

The variety is very abundant in sugar contents, and has more acids than Zilavka. It gives the wine of a greenish yellow color, with plenty of alcohol, with good extract, but it has no flavor. In a pure varietal composition its quality is not good, but it combines well with Zilavka.

Intra-variety variability: It is a very heterogeneous variety, because it has several types. However, selection of clones has not been conducted.

KRKOŠIJA









BENA

Sinonimi: Benac

Podrijetlo: Nepoznata je podrijetla i smatra se autohtonom hercegovačkom sortom.

Rasprostranjenost: Bena je raširena po cijelom području Hercegovine kao prateća sorta Žilavki.

Botanički opis: Trs nešto slabiji nego u Žilavke. Mladica srednje debljine, plosnata, glatka s glatkim dlačicama, zatvoreno žute boje.

List srednje veličine, petodijelan, s urezima koji dopiru do polovice plojke i u dnu su zakržljali. Peteljkin sinus otvoren u obliku slova V, često je zatvoren, ali nije preklopljen. Plojka je čvrsta i debela, s lica hrapava, a naličje dlakavo samo na rebrima. Rebra su zelena s obje strane, zupci sitni i tupi. Rub lista savijen na niže.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd je velik, razgranat, rastresit, piramidalan, obično s jednim krilcem. Peteljka grozda kratka i odrvenjena.

Bobice su velike, duguljaste ili jajolike, glatke i prozračne, zlatnožute boje, pokožica tanja nego kod Žilavke. Meso je slatko, bez izražene arome s 1 – 2 sjemenke. Bobice se vrlo lako osipaju i pri slabijem potresu, što joj je veliki nedostatak.

Gospodarsko-tehnološka svojstva: Sazrijeva u prvoj polovini rujna. Oplodnja je normalna i redovita. Sorta je za toplije krajeve, jako otporna prema plamenjači i pepelnici. Rodnost je dobra uz kratku rezidbu. Izdržljivija je od Žilavke pa može uspijevati na slabijim i nepovoljnim položajima.

Mošt sadrži 16 – 22 % šećera i 4,9 – 7,8g/L ukupnih kiselina. Vino je osrednje kakvoće, jer sadrži manje alkohola od Žilavke. Bena nema slast Žilavke i Krkošije i kao vinska sorta zaostaje za njima, ali se može miješati s tim dvjema sortama. Može se koristiti i u svježem stanju.

Unutarsortna varijabilnost: Varijabilnost unutar sorte nije proučena

BENA

Synonyms: Benac

Origin: Its origin is unknown and it is considered an autochthonous Herzegovinian variety

Botanical description: Vine slightly weaker than in Zilavka. Shoot has a medium thickness, flat, smooth with smooth hairs, dark yellow color.

Leaf has a medium size, five lobes, with indentations that reach the middle of leaf blades and at the bottom they are stunted. Petiole sinus is open in a V-shape, it is often closed but not overlapping. Blade is hard and thick, on the face it is rough and the back side is hairy only on veins. veins are green on both sides, teeth are fine and blunt. Leaf edge is bent downwards.

Morphologically and functionally, flower is hermaphrodite.

Bunch is large, branched, loose, pyramidal, usually with one wing. Bunch stem is short and woody.

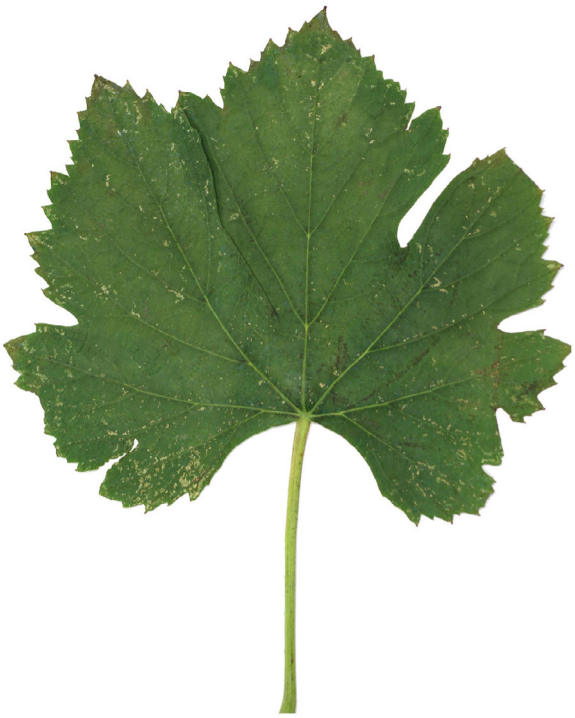
Berries are large, elongated or oviform, smooth and in ethereal, gold yellow color, skin thinner than in Zilavka. Flesh is sweet, without a distinct aroma, with 1 - 2 seeds. Berries very easily come off even when weakly shaken, which is its major disadvantage.

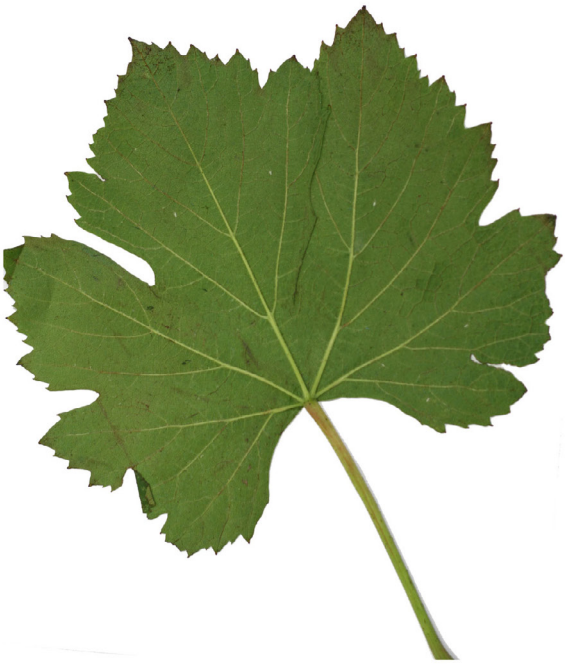
Economic and technological properties: It repens in the first half of September. Fertilization is normal and regular. Variety for warmer areas, very resistant to downy and powdery mildew. Yield is good with short pruning. It is more resistant than Zilavka so it can be grown on poorer and unfavorable positions.

Must contains 16 - 22% sugars and 4.9 – 7.8 g/L of total acids. Wine quality is medium, because it contains less alcohol than Zilavka. Bena does not have the deliciousness of Zilavka and Krkosija and as a wine variety it is inferior to them, but can be mixed with these two varieties. It can also be used fresh.

Intra-variety variability: No information about intra-variety variability

BENA









DOBROGOSTINA

Sinonimi: Toboluša, a po Buliću još se zove Trbljan bijeli i Dragoboština. Međutim, analiza genetskih markera je pokazala da Dobrogostina nije srodna s Trbljanom

Podrijetlo: Nepoznata podrijetla, može biti iz Hercegovine ili Dalmacije.

Rasprostranjenost: Uzgaja se na području cijele Hercegovine i u Dalmaciji. Nekada se veoma mnogo uzgajala na području Konjica pod imenom Toboluša.

Botanički opis: Trs je srednje razvijen i srednje bujan. Vrh zelene mladice je tanak, savijen, vunast i jasno zelen.

List srednje veličine do velik, okrugao ili duguljast, petodijelan do sedmodijelan, lice zeleno i golo, a naličje malo vunasto, peteljkin sinus široko otvoren, a postrani zatvoreni. Zupci krupni i dugi. Peteljka umjereno duga

Cvijet je morfološki i funkcionalno hermafroditan.

Grozd je velik, težak katkad više od kg, piramidalan, rastresit ili srednje zbijen, drška grozda debela i drvenasta.

Bobice nejednake, ali većinom velike i po koja srednja, okrugle, žutozelene boje, neprozirne, meke i sočne, pokožica tanka.

Gospodarsko-tehnološka svojstva: Traži duboka i umjereno vlažna zemljišta. Prema bolestima nije jako osjetljiva. Pripada najrodnijim sortama. Kako su joj bobice krupne i pune soka, a pokožica tanka, to u vlažnim i kišovitim godinama lako pucaju. Dozrijeva u IV. epohi.

Grožđe je dobro za jelo kao stolna sorta, ali se ne može dugo čuvati. Iz Konjica se u prošlosti kao stolno grožđe velika količina prodavala u Bosni. Mošt sadrži u prosjeku 16 – 19 % šećera i 6 – 8 g/L ukupnih kiselina. Vino je srednje jačine, s 9 – 11 % alkohola i vrlo harmonično.

Unutarsortna varijabilnost: Zapaženi su različiti tipovi, ali klonska selekcija nije provođena.

DOBROGOSTINA

Synonyms: Tobolusa, and according to Bulic it is also called Trbljan bijeli and Dragobostina. However, the analysis of genetic markers has shown that Dobrogostina and Trbljan have not genetic similarity.

Origin: Unknown, can be from Herzegovina or Dalmatia.

Range: It is grown in the area of the entire Herzegovina and in Dalmatia. It used to be grown to a very large extent in the area of Konjic under the name of Tobolusa.

Botanical description: Vine is medium developed and medium vigorous. Top of green shoot is thin, bent, woolly and clearly green.

Leaf is medium to large sized, rounded or oblong, in five to seven lobes, face green and bare, and back side a little woolly, petiole sinus widely open, and side ones closed. Teeth large and long.

Morphologically and functionally, flower is hermaphrodite.

Bunch is large, heavy at times more than a kilo, pyramidal, loose or medium compact, grape stem thick and woody.

Berries unequal, but mostly large and a few medium sized, round, in yellow green color, opaque, soft and juicy, thin skin.

Economic and technological properties: It requires deep and moderately moist soils. It is not very sensitive to diseases. It belongs to the most yielding varieties. As its berries are large and full of juice, and cuticle thin, so in humid and rainy years they break easily. It ripens in the 4th period.

Grapes are good for eating as a table variety, but cannot be kept for long. Large quantities from Konjic were sold in Bosnia as table grapes in the past. Must contains an average of 16 - 19% sugar and 6 - 8 g/L total acids. Wine is medium strong, with 9 - 11% alcohol and very harmonious.

Intra-varietal variability: Some different types have been noticed, but clonal selection has not been conducted.

DOBROGOSTINA









POŠIP BIJELI

Sinonimi: Prošip bijeli

Podrijetlo: Sorta podrijetlom s otoka Korčule, nastala kao spontani križanac Bratkovine bijele i Zlatarice blatske bijele (Piljac i sur., 2002.).

Rasprostranjenost: U manjoj mjeri uzgaja se na području cijele Hercegovine, a nekada je posebno bio rasprostranjen na Jablaničkom vinogorju.

Botanička svojstva: Trs srednje bujan, srednje vegetacije i jakih mladica. Vršak mladice jedva zavinut, gol, jednozelen. List pentagonalan, srednje ili slabo urezan, s 3 – 5 liski. Peteljka gola i vrlo kratka; lice jasno zeleno, glatko, svijetlo i golo; naličje također golo; peteljkin sinus pravokutno otvoren; zupci nejednaki, srednje dugi, vrlo oštri.

Cvijet morfološki i funkcionalno dvospolan.

Grozd srednji i poveći, piramidalan, razgranat i rastresit s dva do tri krilca na dugoj obješenoj peteljkovini.

Bobice srednje ili poveće, jajasto-šiljaste, žute, prozirne, drška tanka i duga. Pokožica je tanka, obilno oprašena, poluprozirna, mesnata, sočna i slatka mesa, specifične užitne sortne arome.

Gospodarsko-tehnološka svojstva: Najbolje uspijeva na položajima zaštićenim od vjetrova, jer mu se ne samo mladice, već i grožđe i lišće lako lomi. Ne podnosi vlažne zemlje i položaje, jer je izvanredno osjetljiv prema peronospori. Godi mu niski uzgoj i kratak rez, ali podnosi i rezidbu za odrine.

Oplodnja uglavnom redovita. Dozrijeva u II. epohi. Ovisno o položaju, opterećenju i tehnologiji uzgoja slador može varirati od 17 – 25 %, a ukupne kiseline 6,0 – 8,5 g/l. Pošip je jedno od najcjenjenijih vina hrvatskoga juga, a u posljednje vrijeme počeo se proizvoditi i u Hercegovini. Vino je nježno, zelenožute boje, ugodne i prepoznatljive arome.

POSIP BIJELI

Synonyms: Prosip bijeli

Origin: The variety originates from the island of Korcula, developed as a spontaneous cross between Bratkovina bijela and Zlatarica blatska bijela (Piljac et al.. 2002.).

Range: To a lesser extent cultivated throughout Herzegovina, and once it was particularly widespread in the Jablanica wine growing region.

Botanical properties: Vine is medium vigorous, with medium vegetation and strong shoots. Shoot tip barely curved, bare, uniformly green. Leaf pentagonal, medium or low indented, with 3 - 5 blades. Petiole bare and very short; face clearly green, smooth, bright and bare; back side is also bare; petiole sinus rectangularly open; teeth unequal, medium long, very sharp.

Morphologically and functionally, flower is bisexual.

Bunch medium and fairly large, pyramidal, branched and loose with two to three wings on long suspended stems.

Berries are medium or larger, ovate and pointed, yellow, transparent, stem thin and long. Skin is thin, abundantly powdered, semitransparent, fleshy, with juicy and sweet flesh, of specific delicious varietal aroma.

Economic and technological properties: It grows best on positions protected from winds, because not only its shoots, but also grapes and leaves easily break. It does not tolerate wet soils and positions, because it is exceptionally sensitive to peronospora. It needs low growing and short pruning, but also tolerate pruning for trellis work.

Fertilization mainly regular. It ripens in the 2nd period. Depending on the position, load, and cultivation technology, sugar may vary from 17 to 25%, and total acids from 6.0 to 8.5 g/l. Posip is one of the highest-prestige wines of the Croatian south, and its cultivation started recently in Herzegovina too. The wine is delicate, in greenish yellow color, with a pleasant and recognizable aroma.

POŠIP BIJELI









ZLOŽDER

Sinonimi:

Podrijetlo: Smatra se autohtonom hercegovačkom sortom.

Rasprostranjenost: Danas se još može naći u starijim vinogradima i na odrinama u Mostarskom vinogorju.

Botanička svojstva: Trs bujan, vrh mladice otvoren i povijen s jednom do dvije vitice.

List stožasta oblika s pet liski, površina lista umjerena sjaja, peteljkin sinus umjereno otvoren i ima oblik slova U. Postrani sinusi umjereno urezani.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd kratak do srednji, srednje težine, stožasta oblika, veoma zbijen s jednim do dva krilca. Peteljka kratka.

Bobica srednje dužine i širine, srednje težine, kuglasta oblika, pokožica zelene boje, sjemenke potpuno formirane.

Gospodarsko-tehnološka svojstva: Oplodnja redovita, a rodnost dobra. Često se uzgaja na odrinama gdje se može držati do dugo u jesen.

Sadržaj šećera i kiselina umjeren, ali kiselina ima više od Žilavke.

Unutarsortna varijabilnost nije proučena

ZLOZDER

Synonyms:

Origin: It is considered as autochthonous Herzegovinian variety.

Range: Nowadays it can be found in older vineyards and on trellis works in the Mostar wine-growing region.

Botanical properties: Vine is vigorous, shoot top is open and bent with one to two tendrils.

Conically shaped leaf with five lobes, leaf surface of moderate gloss, petiole sinus moderately open and U-shaped. Side sinuses are moderately indented.

Morphologically and functionally, flower is hermaphrodite.

Bunch short to medium, of medium weight, conical shape, very compact with one to two wings. Stem is short.

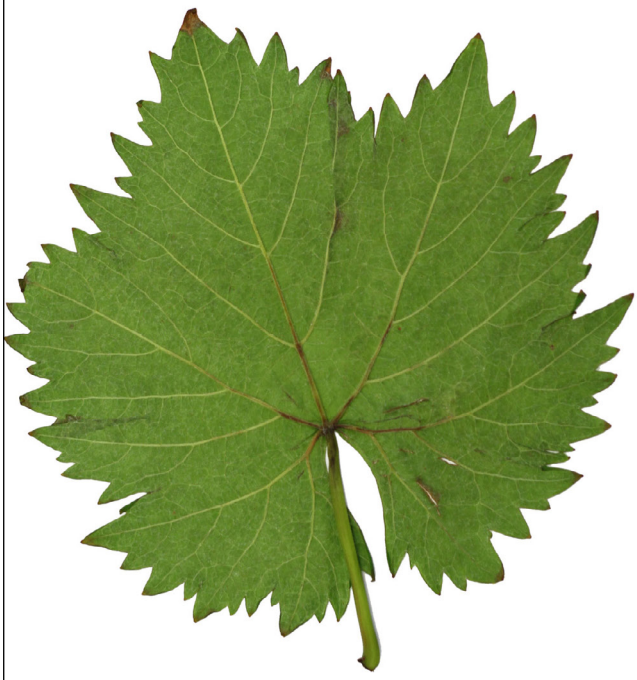
Berry has medium length and width, medium weight, spherical shape, skin in green color, seeds fully formed.

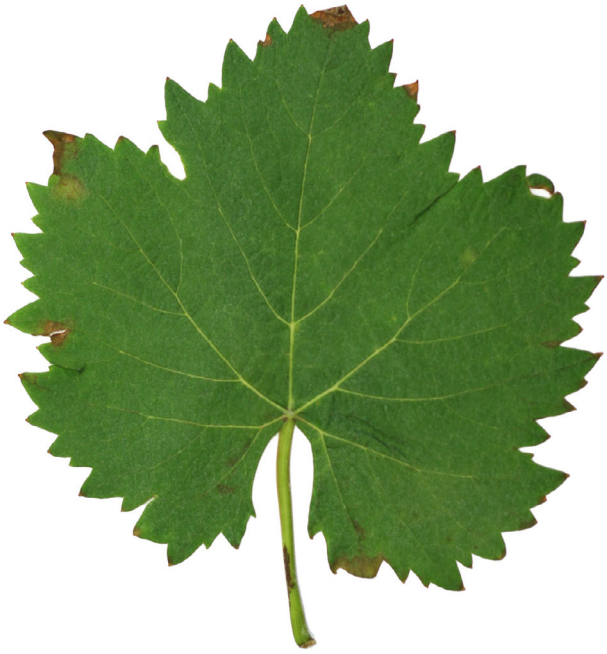
Economic and technological properties: Fertilization is regular and yield is good. It is often grown on trellis works where it can last until long in the fall.

Content of sugars and acids is moderate, but it has more acids than Zilavka.

Intra-varietal variability is not studied

ZLOŽDER









PODBIL

Sinonimi: Podbjel

Podrijetlo: Nepoznata podrijetla, a analiza genetskih markera na devet SSR lokusa pokazala je da ima isti profil kao i sorta Zlatarica iz Dalmacije.

Rasprostranjenost: U manjoj mjeri uzgaja se u Mostarskom vinogorju.

Botanička svojstva: Trs umjereno bujan. Vrhovi mladica otvoreni, umjereno povijeni s jednom do dvije vitice.

List piramidalna oblika, petodijelan, peteljkin sinus zatvoren do preklopljen, ima oblik slova U. Postrani sinusi umjereno urezani. Peteljka kratka.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd kratak do srednje dug, male do srednje težine, zbijen, ima jedno do dva krilca. Peteljka kratka.

Bobica srednje dužine i širine, okruglasta oblika, relativno tvrda, pokožica zelena, sjemenke u bobici potpuno formirane.

Gospodarsko-tehnološka svojstva:
Oplodnja redovita i dobra.

Sadržaj šećera i kiselina umjeren.

Unutarsortna varijabilnost nije proučavana

PODBIL

Synonyms: Podbjel

Origin: It is of unknown origin, and the analysis of genetic markers at nine SSR loci has shown that it has the same profile as the variety Zlatarica from Dalmatia.

Range: To a lesser extent cultivated in the Mostar wine-growing region.

Botanical properties: Vine moderately vigorous. Shoot tops are open, moderately bent with one to two tendrils.

Leaf is pyramidal in shape, with five lobes, petiole sinus closed to overlapping, U-shaped. Side sinuses are moderately indented.

Morphologically and functionally, flower is hermaphrodite.

Bunch is short to medium long, of small to medium weight, compact, has one to two wings. Stem is short.

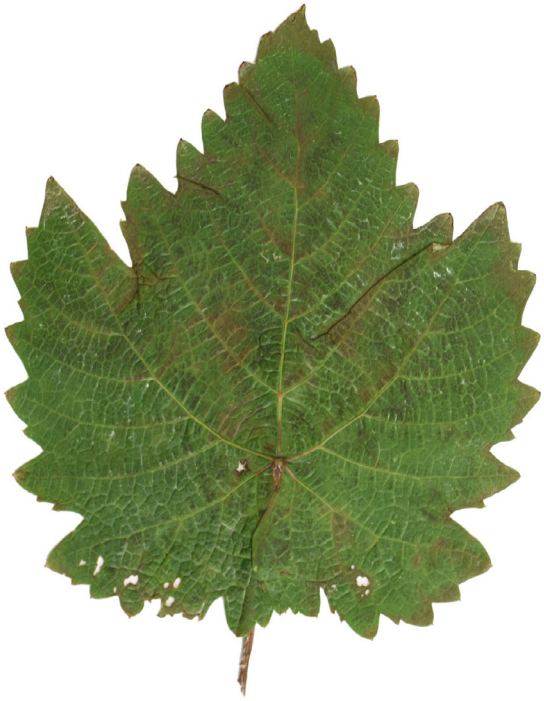
Berry has a medium length and width, roundish shape, skin is green, seeds in berry fully formed.

Economic and technological properties:
Fertilization is regular and good.

Contents of sugars and acids moderate.

Intra-varietal variability is not studied

PODBIL









ŠLJIVA BIJELA

Sinonimi:

Podrijetlo: Nepoznato

Rasprostranjenost: Uzgaja se u manjoj mjeri po odrinama kao grožđe za jelo, ali se koristi i za vino.

Botanička svojstva: Trs bujan, vrhovi mladica otvoreni, umjereno povijeni s jednom do dvije vitice.

List piramidalna oblika s pet ili ponekad sedam liski, zupci s obje strane uspravni i konveksni. Peteljkin sinus široko otvoren, ima oblik slova U. Postrani sinusi umjereno urezani.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd srednje dužine do dug, rastresit, umjereno težak do težak, stožasta i izdužena oblika s

2 – 3 krilca. Peteljka kratka.

Bobica umjereno duga i široka, eliptična oblika.

Gospodarsko-tehnološka svojstva: Oplodnja redovita i dobra, rodnost dobra. Odgovaraju joj dublja i plodnija tla gdje može ostvariti visok prinos

Sadržaj šećera i kiselina umjeren. Grožđe se koristi za jelo, ali i u mješavini sorata za proizvodnju vina.

Unutarsortna varijabilnost nije proučavana

SLJIVA BIJELA

Synonyms:

Origin: Unknown

Range: It is cultivated to a lesser extent on trellis works as food grapes, but is also used for wine.

Botanical properties: Vine vigorous, shoot tops are open, moderately bent with one to two tendrils.

Leaf is pyramidal in shape with five or sometimes seven lobes, teeth on both sides vertical and convex. Petiole sinus widely open, U-shaped. Side sinuses are moderately indented.

Morphologically and functionally, flower is hermaphrodite.

Bunch is of a medium length to long, loose, moderately heavy to heavy, with conical and elongated shape with two to three wings. Stem is short.

Berry moderately long and wide, of elliptical shape.

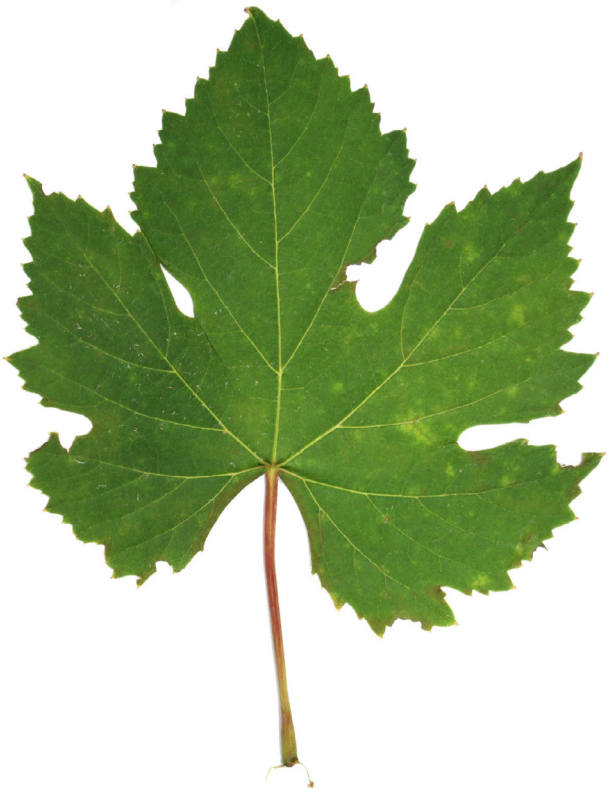
Economic and technological properties: Fertilization regular and good, yielding good.

Contents of sugars and acids is moderate. Grapes are used as food, but also in a mixture of varieties for preparation of wine.

Intra-varietal variability is not studied.

ŠLJIVA BIJELA









BLATINA

Sinonimi: Zbog rizika u oplodnji zovu je Zlorod ili Praznobačva.

Podrijetlo: Blatina je autohtona sorta Hercegovine. Ima više hipoteza o njezinu podrijetlu i nazivu. Jedni smatraju da je najprije uzgajana oko Mostara odakle se raširila po Hercegovini i djelomice susjednoj Dalmaciji. Drugi smatraju da potječe iz doline Neretve iz neretvanskoga blata po čemu je dobila ime.

Rasprostranjenost: Raširena je u cijelom hercegovačkom vinogradarskom rajonu kao najvažnija sorta crnoga grožđa.

Botanička svojstva: Ima veoma bujan trs, vrh mladice je neznatno povijen, ružičastozelene boje, slabo dlakav.

List je krupan, petodijelan, sinusi su duboki i preklopljeni, peteljkin sinus je zatvoren i preklopljen. Lišće je tamnozelene boje, lice lista golo, naličje dlakavo. Rebra pri osnovi crvenkaste boje. Zupci plojke srednji i oštri. Peteljka dugačka, crvena, ali kraća od plojke.

Cvijet je funkcionalno ženski, tučak je normalan, ali su prašnici zakržljali i spušteni. Stoga se Blatina mora saditi u smjesi s drugim sortama koje će joj biti oprašivači.

Grozd: srednje krupan do krupan, ovisno o uspješnosti oplodnje. Oblik grozda je valjkast i piramidalan. Uglavnom je rastresit, ali je pri dobroj oplodnji zbijen.

Bobica je obično krupna, ali je u grozdu često nejednake krupnoće zbog neujednačene oplodnje. Okrugle su s tankom i glatkom pokožicom. Boja pokožice je tamnoplava do crna. Meso je bezbojno.

Gospodarsko-tehnološka svojstva: Dozrijeva u III. epohi, oplodnja je neredovita zbog specifične građe cvijeta. Ovisno o oplodnji prinos može biti nizak do veoma visok. Dobre rezultate daje uzgojem na toplim i nešto suhljim položajima.

Mošt sadrži u prosjeku 18 – 21 % šećera, 6 – 7 g/L ukupnih kiselina. Vino je tamnocrvene boje, aromatično i veoma ugodna okusa, traženo i cijenjeno.

Dobra kompatibilnost s podlogama koje se koriste u našem području.

Unutarsortna varijabilnost: Zapažene su stanovite razlike unutar sorte, ali nisu još dovoljno proučene.

BLATINA

Synonyms: Because of its risk in fertilization, it is called Zlorod (evil-crop) or Praznobačva (empty-barrel)

Origin. Blatina is an autochthonous variety of Herzegovina. There are several hypotheses about its origin and name. Some think that it was first cultivated around Mostar from where it spread out in Herzegovina and partly in neighboring Dalmatia. Others believe that it originates from the Neretva valley from the Neretva mud (blato) after which it was named.

Range. It is widespread throughout Herzegovinian wine-growing zone as the most important variety of red grapes.

Botanical properties. It has a very vigorous vine, shoot top is slightly bent, pink green in color, little hairy.

Leaf is large, in five lobes, sinuses are deep and overlapping, petiole sinus is closed and overlapping. Leaves are dark green, face of leaf bare, back side hairy. Veins at the base in reddish color. Blade teeth medium and sharp. Petiole long, red, but shorter than blade.

Flower is functionally female, pestle normal, but stamina are stunted and lowered. Therefore Blatina must be planted in a mixture with other varieties that will be its pollinators.

Bunch medium large to large, depending on the success of fertilization. The shape of bunch is cylindrical and pyramidal. It is mainly loose, but with good fertilization it is compact.

Berry is usually large, but in a bunch its size is often unequal due to uneven fertilization. They are rounded with thin and smooth skin. The color of skin is blue black. Flesh is colorless.

Economic and technological properties: It ripens in the 3rd period, fertilization irregular due to specific flower structure. Depending on fertilization, yield may be very low to very high. It gives good results by cultivation on warm and somewhat dryer positions.

Must contains an average of 18 - 21% sugars, 6 - 7 g/L total acids. Wine is dark red in color, aromatic and with a very pleasant taste, popular and highly valued.

Good compatibility with rootstocks that are used in our area.

Intra-variety variability: Some differences are noted within the variety, but they are not sufficiently studied yet.

BLATINA









TRNJAK

Sinonimi: Trnak, Kovačuša, Rudežuša

Podrijetlo: Smatra se autohtonom sortom Dalmatinske zagore odakle se proširila u Hercegovinu.

Rasprostranjenost: Gaji se oko Imotskog, Vrgorca, Gruda, Ljubuškog, a danas se širi i u ostale dijelove Hercegovine.

Botanički opis: Trs veoma bujan. Vrh mladice poluotvoren i povijen, s jednom do dvije vitice.

List je okrugao ili duguljast, slabo urezan, petodijelan, naličje golo, peteljkin sinus zatvoren i u obliku lire. Zupci uspravni. Peteljka lista kratka.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd je srednje veličine, zbijen, piramidalna oblika. Ima jedno do dva krilca.

Bobice su srednje krupnoće, okrugle i modre. Meso intenzivno obojeno, pa može služiti kao bojadiser za Blatinu. Sjemenke potpuno formirane.

Gospodarsko-tehnološka svojsta: Oplodnja redovita, rodnost dobra. Dozrijeva u III. epohi. Najbolje mu odgovaraju tla tipa crvenica, srednje visoko stablo i kratak rez. Ožiljava se dobro, afinitet s podlogama poput Kobera 5BB je dobar.

Ima visok sadržaj šećera i obojeno meso. Vino je rubin tamnocrvene boje, jako, puno, harmonično, ugodne arome.

Unutarsortna varijabilnost: Postoje razlike između tipova unutar sorte. Veliki trnjak ima duži grozd i krupne bobice, a Mali trnjak ima manji zbijeniji grozd i sitnije bobice. Selekcija unutar sorte nije provođena.

TRNJAK

Synonyms: Trnak, Kovacusa, Rudezusa.

Origin: It is considered to be an autochthonous variety of Dalmatian Zagora, from where it spread out to Herzegovina.

Range: It is cultivated around Imotski, Vrgorac, Grude, Ljubuski, and nowadays it is spreading to other parts of Herzegovina.

Botanical description: Vine very vigorous. Shoot top half-open and bent, with one to two tendrils.

The variety has a rounded or elongated leaf, weakly indented, in five lobes, back side bare, petiole sinus closed and lyre-shaped. Teeth upright. Leaf petiole short.

Morphologically and functionally, flower is hermaphrodite.

Bunch is medium sized and compact, in pyramidal shape. It has one to two wings.

Berries have a medium largeness, rounded and blue. Flesh intensely colored, so it can be used as teinturier for Blatina. Seeds fully formed.

Fertilization regular, yielding good. It ripens in the 3rd epoch

Economic and technological properties: Best suited to the variety are terra rossa-type soils, medium high tree and short pruning.

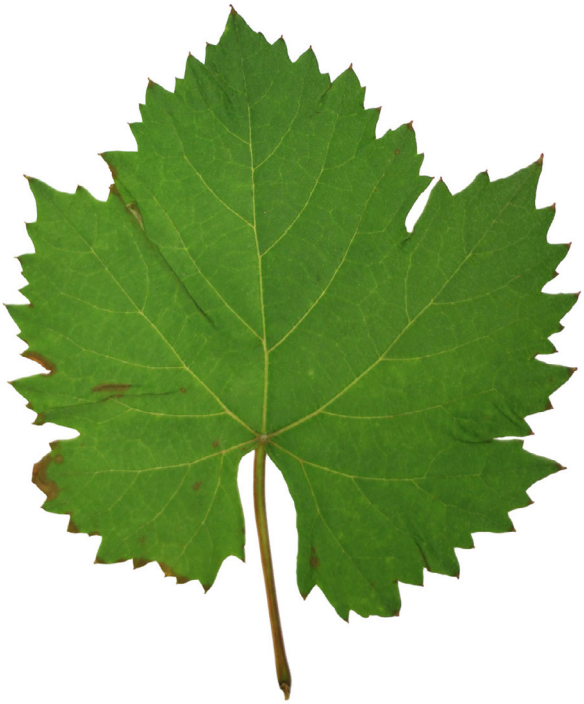
It revives well, compatibility with rootstocks like Kober 5BB good.

It has a high contents of sugars and colored flesh. Wine is dark ruby red in color, strong, full bodied, harmonious, with pleasant aroma.

Intra-variety variability: There are differences between types within the variety. Veliki trnjak has long bunch and large berries, while mali Trnjak has smalled denser bunch and smaller berries. Selection within the variety has not been conducted.

TRNJAK









PLAVKA

Sinonimi: Plavina, Plajka, Plavinac, Modrulj

Podrijetlo: Nastala je križanjem Crljenka kaštelanskog i talijanske sorte Verdeca (Lacombe, 2007.), ali se smatra da je autohtona sorta hrvatskoga jadranskog područja odakle je donesena u Hercegovinu.

Rasprostranjenost: Veoma rasprostranjena u Dalmaciji, a u Hercegovini se u manjoj ili većoj mjeri uzgaja na cijelom vinogradarskom području.

Botanička svojstva: Trs je srednje razvijen i srednje bujan. Vršci mladica su tanki, svijetlo pepeljasto-vunasti, s ljubičastim vršcima. Mladica je uspravna lako lomljiva.

List je srednje velik, okrugao, najčešće peterodijelan, ali može imati i sedam liski, plitkih ili srednje dubokih zatvorenih sinusa, a peteljkin sinus je otvoren ili elipsoidno preklopljen. Lice je tamnozeleno, a naličje zeleno. Zupci su uvrnuti, tupi. Peteljka krhka i dugačka.

Cvijet je morfološki i funkcionalno hermafroditan.

Grozd je srednje velik i srednje zbijen, piramidalan ili cilindričan, rijetko s jednim krilcem, pun.

Bobice okrugle ili malo sploštene, srednje veličine, plave, a u zatvorenom dijelu grozda ljubičaste, tanke kožice, sočna mesa i bezbojna soka.

Gospodarsko-tehnološka svojstva: Sorta prikladna za duboka, plodna i vlažna tla. Oplodnja je vrlo dobra tako da se ne osipa ni u uvjetima dobre ishranjenosti. Dozrijeva početkom treće epohe.

Rodnost je redovita i vrlo dobra. Slador u granicama 16 – 20 %, što ovisi o položaju i tehnologiji proizvodnje, a ukupna kiselost je u rasponu 5,0 – 8,0 g/l. Vino je lagano, skladno, užitno, slaba intenziteta, rubin crvene boje, prikladno u tipu ružičastih vina.

Unutarsortna varijabilnost: U populaciji Plavke uočava se više biotipova kao što su: Plavina mala, Plavina velika, Plavina krhka, Brajdica crna. Selekcija se provodi u Republici Hrvatskoj.

PLAVKA

Synonyms: Plavina, Plajka, Plavinac, Modrulj.

Origin: It was created by crossing of Crljenak kastelanski with Italian variety Verdeca (Lacombe, 2007), but it is considered to be an autochthonous variety of the Croatian Adriatic area from where it was brought to Herzegovina.

Range: Very widespread in Dalmatia, and in Herzegovina it is grown in varying degrees throughout the wine-growing area.

Botanical properties: Vine is medium developed and medium vigorous. Shoot tops are thin, light ashy-woolly, with violet tips. Shoot is vertical easily breakable.

Morphologically and functionally, flower is hermaphrodite.

Leaf is medium-sized, round, usually in five lobes, but may have also seven blades, with shallow or medium deep closed sinuses, sharp bottom, and petiole sinus is opened or elliptically overlapping. Face is dark green and back side green. Teeth are warped, blunt. Petiole is fragile and long.

Bunch is medium-sized and medium compact, pyramidal or cylindrical, rarely with one wing, full.

Berries are rounded or little flattened, medium sized, blue and in the closed part of the bunch violet, with thin skin, juicy flesh and colorless juice.

Economic and technological properties: Variety suited to deep, fertile and moist soils. Fertilization is very good so that it does not come off even in conditions of good nutrition. It ripens in the beginning of the third period.

Yielding is regular and very good. Sugar within limits 16 - 20%, which depends on the position and production technology, and the total acidity is in the range from 5.0 to 8.0 g/l. Wine is light, harmonious, delicious, of low intensity, ruby red colored, suited in the type of rose wines.

Intra-variety variability: Several biotypes are observed in the population of Plavka crna, such as Plavina mala, Plavina velika, Plavina krhka, Brajdica crna. Selection is conducted in the Republic of Croatia.

PLAVKA









POŠIP CRNI

Sinonimi: Prošip crni

Podrijetlo: Nepoznato, ali je moguće da potječe iz Dalmacije kao i Pošip bijeli. Bulić navodi da se uzgaja na Korčuli i oko Kaštela, ali ne daje nikakav opis kao što daje za većinu sorata iz Dalmacije.

Rasprostranjenost: U Hercegovini se nekad šire uzgajala, a najviše u Konjičkom vinogorju. Danas se tu mogu još naći sam trsovi u starim vinogradima.

Botanička svojstva: Vrh mladice uspravan i potpuno otvoren, ima jednu do dvije vitice, boja mladoga listića je bronzirana.

List je kružna oblika sa sedam i više liski. Peteljkin sinus je preklopljen, baza sinusa je u obliku slova V, lateralni sinusi su plitki do umjereno urezani i na njima su prisutni zupci. Zupci su oštri.

Cvijet funkcionalno ženski.

Grozd male težine, cilindrična oblika, srednje dug, zbijen s jednim do dva krilca.

Bobica male težine, kratka i umjereno široka, elipsoidna oblika, pokožica ružičaste boje, meso bezbojno, sjemenke potpuno formirane.

Gospodarsko-tehnološka svojstva: Dozrijeva u III. epohi. Oplodnja dobra, sorta rodna, ali se često dogodi da u grozdu ima zelenkastih i nedozrelih bobica u vrijeme berbe.

Sadržaj šećera i kiselina umjeren.

Unutarsortna varijabilnost: Postoji Pošip roze koji ima ružičastu boju pokožice. No nije provođena genetska analiza pa se ne zna jesu li to dvije forme iste sorte ili dvije različite sorte

POSIP CRNI

Synonyms: Prosip crni

Origin: It is of unknown origin, but it is possible that it originates from Dalmatia like Posip bijeli. Bulic states that it is grown in Korcula and around Kastela, but does not give any description as he gives for most of varieties from Dalmatia.

Range: It used to be cultivated in Herzegovina more extensively, and mostly in the Konjic wine-growing region. In these days, it is possible to find only vines in old vineyards.

Botanical properties: Shoot top is upright and fully open, it has one to two tendrils, color of young leaves is bronzed.

Leaf has a circular shape with seven or more lobes. Petiole sinus is overlapping, sinus base is V-shaped, lateral sinuses are shallow to moderately indented and teeth are present on them. Teeth sharp.

Flower functionally female.

Bunch has a small weight, cylindrical shape, it is medium long, compact with one to two wings.

Berry has small weight, it is short and moderately wide, in ellipsoidal shape, skin in pink color, seeds fully formed.

Economic and technological properties: It ripens in the 3rd period. Fertilization is good, variety yielding, but it often happens that bunch contains green and unripe berries during harvest.

Intra-varity variability: There is Posip rose variant with rose skin of berries. But genetic analyses have not ben done, so it is not known whether they are two varieties or two variants of same variety.

POŠIP CRNI









MALA BLATINA

Sinonimi: Tu sortu mnogi poistovjećuju s Plavkom i Plavcem malim, ali ona nema ni morfološku ni genetsku sličnost s tim sortama. Sam je naziv sorte također dubiozan. List ima neke sličnosti s Blatinom, ali je sve ostalo drukčije.

Podrijetlo. Ne zna se kako je došla u Hercegovinu, ali postoji velika vjerojatnost da je unesena u vrijeme Austro-Ugarske zajedno sa sortom Alicante Bouschet. Analiza genetskih markera na devet lokusa pokazala je da ta sorta ima isti genetski profil kao francuska sorta Grand Noir de la Calmette koja je dobivena križanjem sorata Graciano i Petit Bouschet tako da ima jednoga zajedničkog roditelja sa sortom Alicante bouschet.

Rasprostranjenost: U Hercegovini se uzgaja u manjoj mjeri u Mostarskom vinogorju na lokalitetima: Brotnja, Mostara, Ljubuškog, Čapljine i Stoca, te na Mostarskom blatu.

Botanička svojstva: Trs umjereno bujan. Vrh mladice poluuspravan i otvoren s jednom do dvije vitice. Boja listića pri vrhu bronča na.

List umjereno krupan, oblik plojke piramidalan do pentagonalan, plojka petodijelna. Zupci s obje strane konveksni. Peteljkin sinus otvoren, baza sinusa u obliku lire, lateralni sinusi urezani.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd umjereno dug, srednje težak, umjereno zbijen, stožasta oblika s jednim do dva krilca. Peteljka grozda kratka.

Bobica umjerene dužine i širine, kuglasta oblika. Boja pokožice crvena do crna, meso bez antocijana.

Gospodarsko-tehnološka svojstva: Oplodnja redovita i obilna, rodnost dobra. Mošt sadrži 18 – 20 % šećera i umjerenu kiselost. No u nekim godinama u grozdu bude nedozrelih bobica. Više joj odgovaraju plodna rastresita tla

Unutarsortna varijabilnost: Nije poznata.

MALA BLATINA

Synonyms: Many identify this variety with Plavka or Plavac mali, but it does not have either morphological or genetical similarity with these varieties. The name of the variety itself is also dubious. Leaf has some similarities with Blatina, but everything else is different.

Origin. It is not known how it came to Herzegovina, but there is a high possibility that it was introduced during Austria - Hungary together with the variety Alicante Bouschet. Analysis of genetic markers at nine loci has shown that this variety has the same genetic profile like the French variety Grand Noir de la Calmette which was developed by hybridizing varieties Graciano and Petit Bouschet so that it has one parent in common with the variety Alicant Bouschet.

Range: In Herzegovina it is cultivated in a lesser degree in Mostar wine-growing region in the sites of Brotnjo, Mostar, Ljubuski, Capljina and Stolac, and in Mostarsko Blato.

Botanical properties: Vine moderately vigorous. Shoot top half-upright with one to two tendrils. Color of leaf bronze at the top.

Leaf is moderately large, the form of blade is pyramidal to pentagonal, blade is in five lobes. Teeth of both sides convex. Petiole sinus open, sinus base in lyre-form, lateral sinuses are indented.

Morphologically and functionally, flower is hermaphrodite.

Bunch is moderately long, medium heavy, moderately compact, in a conical form with one to two wings. Bunch stem is short.

Berry has a moderate length and width, spherical shape. Color of skin red to black, flesh without anthocyanin.

Economic and technological properties: Fertilization regular and abundant, yielding good. Must contains 18 - 20% sugars and moderate acidity. In some years berries are unripened.

Intra-varietal variability is not known

MALA BLATINA









ŠLJIVA CRNA

Sinonimi:

Podrijetlo: Nepoznato, ali analiza genetskih markera na devet lokusa pokazala je da ta sorta ima isti genetski profil kao sorta Razaklija u Hrvatskoj. Sorta Razaklija u Hrvatskoj ima drugačiji genetski profil od sorte Rezakija u Hercegovini.

Rasprostranjenost: Uzgaja se u manjoj mjeri u Hercegovini i u Dalmaciji uz granicu s Hercegovinom.

Botanička svojstva: Trs bujan, vrhovi mladica otvoreni i povijeni s jednom do dvije vitice pri vrhu.

List piramidalna oblika s pet i ponekad sedam liski. Peteljkin sinus umjereno otvoren i ima oblik slova U. Postrani sinusi umjereno urezani.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd umjereno dug, stožasta oblika i izdužen s dva do tri krilca, rastresit. Grozd može biti veoma težak.

Bobice umjereno velike, izdužene, eliptična oblika, srednje teške, pokožica tamnocrvene boje, meso bezbojno.

Gospodarsko_tehnološka svojstva: Oplodnja redovita, rodnost visoka. Često se uzgaja na odrinama.

Sadržaj šećera i kiselina umjeren.

Koristi se za jelo, ali se u mješavini sorata koristi i za vino.

Unutarsortna varijabilnost nije proučavana.

SLJIVA CRNA

Synonyms:

Origin: Unknown, but the analysis of genetic markers at nine loci has shown that this variety has the same genetic profile like the variety Razaklija in Croatia. The variety Razaklija in Croatia has a different genetic profile than the variety Rezakija in Herzegovina.

Range: It is cultivated to a lesser extent in Herzegovina and in Dalmatia close to the border with Herzegovina.

Botanical properties: Vine vigorous, shoot tops are open and bent with one to two tendrils at the top.

Leaf is pyramidal in shape with five or sometimes seven lobes. Petiole sinus moderately open and U-shaped. Side sinuses are moderately indented.

Morphologically and functionally, flower is hermaphrodite.

Bunch is moderately long, in conical shape and elongated, with two to three wings, loose. Bunch can be very heavy.

Berries are moderately large, elongated, in elliptical shape, medium heavy, skin is in dark red color, flesh colorless.

Economic and technological properties: Fertilization regular, yielding high. It is often grown on trellis works.

Contents of sugars and acids is moderate.

It is used as table grape, but in a mixture of varieties it is also used for wine.

Intra-varietal variability is not studied.

ŠLJIVA CRNA









SURAC

Sinonimi: Kadarun, Kadarun suri

Podrijetlo: U Hercegovinu je došao iz Dalmacije, no sudeći po imenu nije isključeno da je podrijetlom iz Turske ili Albanije (Skadar).

Rasprostranjenost: Uzgaja se u područjima uz dalmatinsku obalu, najviše u Popovu polju i oko Trebinja.

Botanička svojstva: Loza srednje snage. Vršak zelenih mladica uspravan ili jedva savinut, tamnozelen i vunast.

List srednji i pravilan, pravilno i srednje urezan, s pet katkada i 7 liski; peteljka crvena, neznatno vunasta; rebra također crvena; lice tamnozeleno i golo; naličje dosta vunasto; peteljkin sinus otvoren, postrani sinusi srednje urezani i otvoreni, a zupci srednji. Ujesen list požuti, a ne pocrveni.

Cvijet morfološki i funkcionalno hermafroditan.

Grozd srednji, jednostruk, umjereno zbijen.

Bobice srednje, jednake, okrugle, sočne, umjereno slatke; pokožica debela i trpka, crne ili smeđe boje, a pokoje zrno i posve zeleno, pa se odlikuju Kadarun bijeli i Kadarun suri.

Gospodarsko-tehnološka svojstva: Uspijeva na svakoj zemlji, a najbolje mu odgovara niski račvasti uzgoj i kratki rez. Dobro podnosi vlagu i ne prhne. Danas se najčešće uzgaja na odrinama.

Dozrijeva u III. epohi.

Grožđe je slabo za jelo, a i vino je lošije kakvoće pa su ga Dubrovčani u davna vremena zvali divljom lozom. Grožđe iz dolinskih zemalja sadržava vrlo malo boje pa ga upotrebljavaju i za proizvodnju bijelih vina.

Unutarsortna varijabilnost nije poznata.

SURAC

Synonyms: Kadarun, Kadarun suri

Origin: It came to Herzegovina from Dalmatia, but judging by the name it is not ruled out that it originates from Turkey or Albania (Skadar)

Range: It is cultivated in areas along the Dalmatian coast, mostly in Popovo polje and around Trebinje.

Botanical properties: Vine of a medium vigor. Tip of green shoots vertical or barely bent, dark green and woolly.

Leaf average and regular, regularly and medium indented, with 5 sometimes also with 7 lobes; petiole red, slightly woolly; veins also red, face dark green and bare; back side rather woolly; petiole sinus open, side sinuses medium indented and open, and teeth medium. In the fall leaf turns yellow, and not red.

Morphologically and functionally, flower is hermaphrodite.

Bunch is medium, one-ply, moderately compact.

Berries are medium, equal, rounded, juicy, moderately sweet; skin is thick and dry, in black or brown color, and a few berries also entirely green, so that Kadarun bijeli and Kadarun suri are distinguished.

Economic and technological properties: It is grown in every soil, and low forked growing and short pruning suit it best. It tolerates well moist and does not flutter off. Today it is most commonly grown on trellis works.

It ripens in the 3rd epoch.

The grape is inferior for food, and the quality of wine is inferior too, so Dubrovnikers called it wild vines in old times. Grapes from valley regions contain very little color so they are used for preparation of white wines too.

Intra-varietal variability is not known.

SURAC









ALICANTE BOUSCHET

Sinonimi: Kambuša, Kalambuša

Podrijetlo: Iako Alicante bouschet nije autohtona hercegovačka sorta, ona se na našem području toliko udomaćila da je mnogi smatraju domaćom sortom. Dobivena je u Francuskoj polovinom 19. stoljeća križanjem sorata Petit Bouschet x Grenache. U Hercegovinu je donesena za vrijeme Austro-Ugarske. Najprije je ispitivana u voćarsko-vinogradarskoj stanci u Gnojnicama kao prateća sorta i bojadiser za Blatinu. Kada se nakon višegodišnjih ispitivanja u te svrhe pokazala uspješnom, raširena je po terenu.

Rasprostranjenost: Iz Francuske se proširila u mnoge zemlje u kojima se uzgajaju sorte za crna vina, a u Hercegovini je raširena na cijelom području kao pratilac Blatine.

Botanička svojstva: Trs je srednje bujan, vrh mladice je dlakav i bjeličastozelen, jednogodišnja mladica je srednje debljine, žutosmeđe boje.

List je srednje veličine, trodijelan ili petodijelan, lice je tamnozelene, a naličje blijedozelene boje i dlakavo. U drugom dijelu vegetacije list dobije crvenkastu nijansu pa je u vinogradu ta sorta lako prepoznatljiva.

Cvijet je morfološki i funkcionalno dvospolan, pa Alicante Bouschet služi kao oprašivač za Blatinu kada su zajedno.

Bobica je srednje veličine, valjkasta oblika. Pokožica je tamnoplave boje, a sok je obojen rubin crvenom bojom.

Grozd je srednje veličine, srednje zbijen i stožasta oblika.

Gospodarsko-tehnološka svojstva: Dozrijeva u III. epohi, oplodnja je normalna i redovita. Sadržaj šećera u moštu varira 18 – 22 %. Vino je srednje kakvoće, veoma obojeno i dosta trpko. Ta se sorta uzgaja samo kao prateća sorta za Blatinu kao bojadiser i obično se preporučuje da je uz sortu kojoj treba pojačati boju bude 5 – 10 %.

Unutarsortna varijabilnost u nas nije istraživana.

ALICANTE BOUSCHET

Synonyms: Kambusa, Kalambusa

Origin: Although Alicante bouschet is not an autochthonous Herzegovinian variety, in our area it is so domesticated that many people consider it a domestic variety. It was developed in France in the middle of the 19th century by cross breeding the varieties Petit bouschet x Grenache. It was brought to Herzegovina during Austria - Hungary. First it was tested in the fruit and wine growing station in Gnojnice as a supporting variety and teinturier for Blatina. When it was found to be successful for these purposes after years of testing, it was spread out in the area.

Range: It was spread from France to many countries in which varieties for red wines were grown, and in Herzegovina it is widespread throughout the area as support for Blatina.

Botanical properties: Vine is medium vigorous, shoot top is hairy and whitish green, annual shoot medium thick yellow brown in color.

Leaf is medium sized, in three or five lobes, face is dark green and back side pale green and hairy. In the second part of vegetation, leaf gets a reddish nuance, so this variety is easily recognizable in a vineyard.

Flower is bisexual morphologically and functionally, so Alicante bouschet is used as a pollinator for Blatina when they are together.

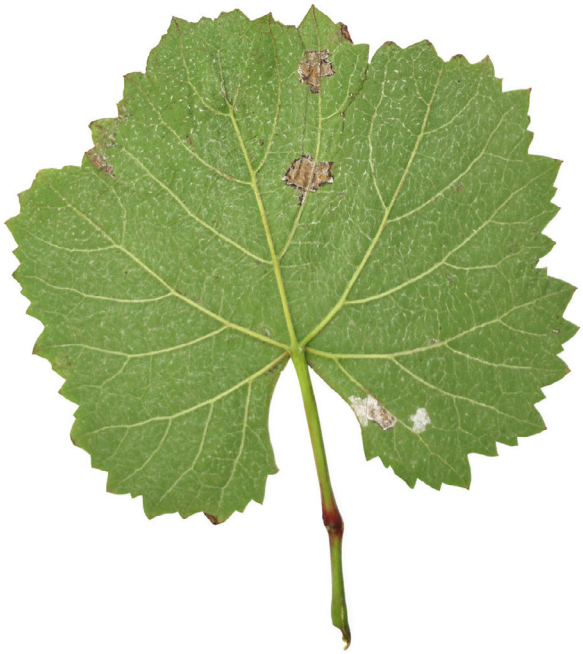
Berry is medium sized, in cylindrical shape. Skin is dark blue in color, and juice colored in ruby red.

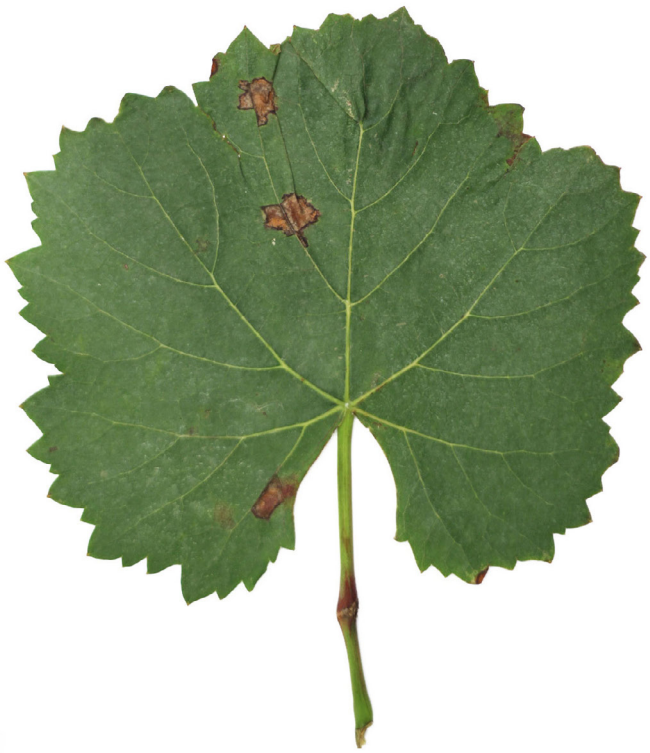
Bunch is medium sized, medium compact and in conical shape.

Economic and technological properties: It ripens in the third epoch, fertilization is normal and regular. Content of sugars in must varies from 18 to 22%. The quality of wine is average, very colored and rather dry. The variety is cultivated only as a support variety for Blatina as a teinturier and is usually recommended with a variety whose color needs to be intensified to be from 5 to 10%.

Intra-varietal variability is not studied in our country.

ALICANTE BOUSCHET









VRANAC

Sinonimi: Vranac crnogorski

Podrijetlo: Iako nije autohtona hercegovačka sorta Vranac smo također uvrstili u ovaj popis jer se već dugo uzgaja na prostoru cijele južne Hercegovine. Najvjerojatnije autohtona sorta Crne Gore nerazjašnjena podrijetla. Poznato je da je u srodstvu u prvom koljenu sa sortom Kratošija (sinonimi: Zinfandel, Primitivo, Crljenak kaštelanski, Tribidrag). Najvjerojatnije je potomak ove sorte, ali joj teoretski može biti i roditelj.

Rasprostranjenost: U Hercegovini se najviše uzgaja na području Trebinja, ali se proširila i na ostale lokalitete u Hercegovini kao prateća sorta Blatini ili za proizvodnju sortnoga vina Vranac.

Botanički opis: Trs vrlo bujan. Vrh mladice uspravan, vunast, blijedo zelenožute boje. Zrela mladica je debela, kratkih internodija.

List srednji do krupan, petodijelan, oštro nazubljen. Lice golo, tamnozeleno. Naličje hrapavo, rebra zelena. Peteljkin sinus u obliku slova V. Peteljka duga, gola, zelena, mjestimice crvena.

Cvijet morfološki i funkcionalno hermafroditan.

Bobica duguljasta, velika ili srednje veličine. Pokožica tanka ili srednje debljine, glatka, bez točkica. Pokožice bogata plavom do crnom bojom, meso također jako obojeno.

Grozd valjkasta oblika, srednje veličine ili veliki, rastresit. Peteljka dugačka.

Gospodarsko-tehnološka svojstva: Oplodnja normalna i redovita, dozrijeva u III. epohi. Ne podnosi niske i vlažne terene, najbolje mu odgovaraju srednje vapnenasta zemljišta. Ima dobru kompatibilnost s podlogama.

Sadržaj šećera varira 20 – 24 %. Vino je ugodna okusa, intenzivno obojeno i harmonično.

Unutarsortna varijabilnost: U okviru sorte zapažena je heterogenost, a selekcija klonova provodi se u Crnoj Gori.

VRANAC

Synonyms: Vranac crnogorski

Origin: Although it is not an autochthonous Herzegovinian variety, we have included Vranac in this list because it has long been cultivated in the region of the entire southern Herzegovina. Most probably an autochthonous variety of Montenegro, of an unexplained origin. It is known that it is in close relationships with variety Kratosija (synonims: Zinfandel, Primitivo, Crljenak kastelanski, Tribidrag). It is most probably descendant of this variety, but theoretically it can be parent as well.

Range: In Herzegovina it is mostly grown in the area of Trebinje, but has spread to other sites in Herzegovina as the variety supporting Blatina or for production of the varietal wine vranac.

Botanical description: Vine is very vigorous. Shoot top is upright, woolly, pale yellowish green in color. Mature shoot thick, with short internodes.

Leaf medium to large, in five lobes, sharply serrated. Face bare, dark green. Back coarse, veins green. Petiole sinus V-shaped. Petiole long, bare, green, in some spots red.

Morphologically and functionally, flower is hermaphrodite.

Berry is elongated, large or medium-sized. Skin thin or medium thick, smooth, without spots. Skin in black blue color, rich in color, flesh also intensely colored.

Bunch in cylindrical shape, medium sized or large, loose. Stem long.

Economic and technological properties: Fertilization normal and regular, ripens in the 3rd epoch. Does not tolerate low or moist terrains, it favors medium limy soils. It has good compatibility with rootstocks.

Contents of sugars vary from 20 to 24%. Wine has a pleasant taste, it is intensely colored and harmonious.

Intra-variety variability: Heterogeneity is observed within the variety, and selection of clones is conducted in Montenegro.

VRANAC









ELEZUŠA



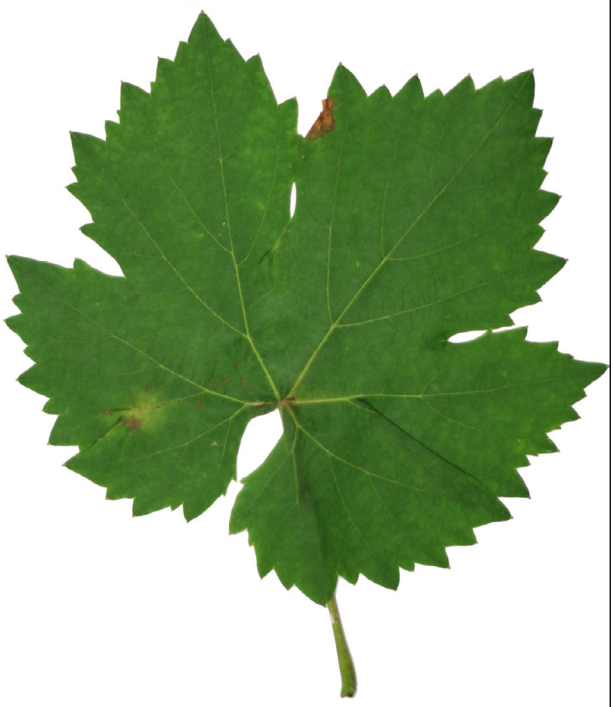






REZAKIJA









MENIGOVKA









MEDENKA









NADIĐAR









RADOVAČA

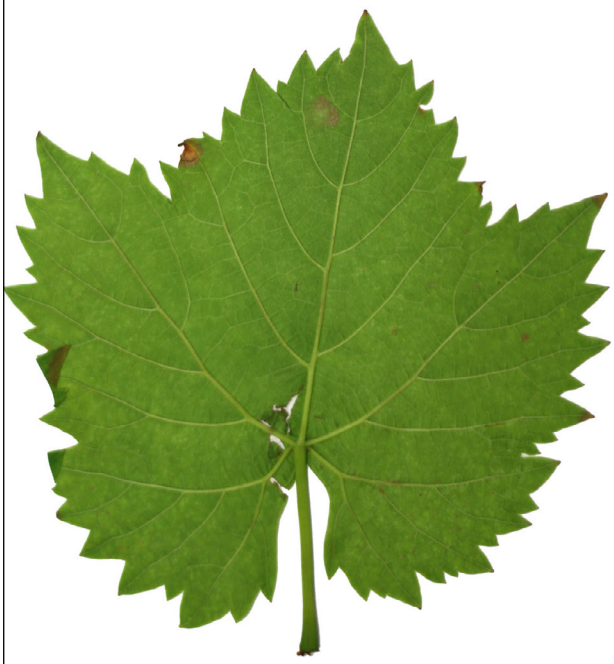








UZBRDNJAČA









ČEVRUŠA









LIPANJKA









ORUČEVKA









ŽESTAC









RUŽA









RUŽICA









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