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## GRAPEVINE GENETIC DIVERSITY IN SERBIA

**Abstract:** This paper presents an overview of grapevine genetic diversity in Serbia. Three major ampelographic collections currently exist within the plant gene bank for the *Vitis* genus in Serbia: 1. Sremski Karlovci — Experimental field of the University of Novi Sad Faculty of Agriculture, with a total of 737 samples; 2. Radmilovac — Experimental field of the University of Belgrade Faculty of Agriculture, with a total of 659 samples and 3. Niš — Centre for Viticulture and Wine Production Niš, with a total of 336 samples. The total number of accessions in all collections is 1732, 941 of which are unique genotypes. Assortment of grapevine in Serbia is composed of varieties of different origins and uses. With respect to origins, all varieties are classified into following groups: 1. autochthonous and regional varieties; 2. international varieties and 3. domestic bred varieties. Of the important autochthonous and regional varieties, 15 wine grape varieties are grown in significant quantity, while international varieties are represented by 15 wine grape and 8 table grape varieties that are grown in significant quantity. Breeding efforts in Serbia have thus far resulted in creation of 75 new varieties and clones which represent significant grapevine genetic resources. Of the aforementioned newly bred domestic varieties, 17 wine grape and 9 table grape varieties are grown in significant quantity. Regardless of the existing diversity, grapevine genetic resources should continue to be enriched because of their significance for the development of viticulture as a whole in Serbia.

**Key words:** *grapevine, diversity, ampelographic collection, viticulture, Serbia*

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## INTRODUCTION

Grapevine (*Vitis vinifera* L.) is a species of the *Vitaceae* family, *Vitis* genus. Representatives of this plant family first appeared in the distant past, in the Cretaceous Period, more than 100 million years ago. First representatives of the Euro-Asian wild grapevine appeared in the Stone Age and can be found growing naturally even today in Europe, Asia, and North Africa. When humans appeared, they used its small, but tasty and nutritive fruit for consumption. According to paleontological research, presence of grapevine can be detected over large areas in prehistoric layers, early Stone Age, Bronze Age and Iron Age. It managed to conquer such a wide area mostly thanks to birds, which helped spread the seeds by feeding on the fruit [2]. Aiming to obtain ever greater quantities of grapes and wine, humans have started to cultivate grapevine, which counts as one of the earliest agricultural activities of humans.

Grapevine has great economic significance. Although it is predominantly grown for wine (80%), cultivation of this plant can result in many products. Basic grapevine product — the grape, can be used raw — as table grapes, it can be processed into wine, syrup, grape juice, dried and used as raisin, or be processed into compote, jelly or jam. By-products of grape processing are pomace and wine lees which can be used for production of oil, alcohol, dyes, tannins, tartaric acid, cattle feed and compost. Even parts of the grapevine pruned from the vine can be used — mature vine for heating and in the lumber industry for production of plywood, while green vine shoots can be used as cattle feed and for production of compost [15].

Current assortment of grapevine is the result of millennia of mutations and cross-breeding, as well as directed selections in the previous two to three hundred years. It is estimated that the total number of different varieties in germplasm collections exceeds 10,000 on the global level [1, 22]. The exact number of varieties is difficult to estimate because of the large number of synonyms and homonyms, which is the consequence of the long history of cultivation, vegetative reproduction and frequent transfers of materials between countries and regions. Schneider et al. [19] considers that there is between 5,000 and 8,000 varieties worldwide, which are grown under 14,000 to 24,000 different names. However, only 300 to 400 of these have major commercial importance.

Bearing the aforementioned in mind, the aim of this paper was to present the genetic diversity of grapevine in Serbia, in order to enrich the gene pool of this species even more and use it for scientific-research and production purposes.

## GRAPEVINE GENETIC RESOURCES IN SERBIA

Serbia is characterised with great diversity of plant genetic resources. Out of the 11,000 plant species growing in Europe, Serbian flora counts around 4,300 species [20]. From that number, plant species cultivated for food make up 4.5% of utilised biodiversity (193 species). It is known that humans have always used plants in nutrition. These were firstly plants from the wild flora, but some 10,000 years ago humans started cultivating plants. Globally, there are between 7,000 and 10,000 plant species that can be used for food and agriculture, which makes up around 3–4% of the total plant biodiversity [16]. In addition to a large number of plant species grown in Serbia, there is also great diversity within individual species. This intraspecies diversity includes varieties, populations and plant selection materials. The totality of intraspecies and interspecies plant diversity in the territory of the Republic of Serbia represents significant genetic resources. Plant genetic resources in Serbia are located at their place of origin or in locations where they developed their characteristics (in situ, on farm) or have been transferred from their natural habitats and are kept in collections of various institutions tasked with conservation of plant genetic resources (ex situ).

Conservation of plant genetic resources of a country primarily has an economic importance. Greater plant genetic resources provide stability to economy and agriculture owing to safe plant production. However, the number of plant genetic resources has a tendency for constant decrease, both globally and in Serbia. The number of plant species is decreasing, as is the number of varieties within species, this is often dubbed as “genetic erosion”. Certain agricultural species and varieties are no longer grown in certain areas, their seeds are lost and the results of millions of years of evolution and thousands of years of cultivation are thus eliminated. Genetic erosion was especially prominent in early twentieth century. It is estimated that from that period up to the present day, more than 70% of all existing genotypes in the world were permanently lost. For these reasons, in order to preserve genetic resources, it is necessary to establish a well-planned and efficient management system, and use said resources in moderation. Today, there are globally around 1,300 registered institutions which are engaged in collection and preservation of plant genetic resources. European central database, EURISCO, provides information on 1.8 million samples of cultivated plants which are stored in 400 institutes in 43 countries of the world [23]. According to the European cooperative program for genetic resources, plant genetic resources for nutrition and agriculture are divided in eight groups: cereals, fodder plants, vegetables, grain legumes, fruits, alternative plants, industrial plants and potato. In South East Europe, within the “South East European Development

Network on Plant Genetic Resources (SEEDNet)”, plant genetic resources for nutrition and agriculture are divided into six groups: cereals and maize, fodder plants, vegetables, industrial plants, medicinal and aromatic plants, fruits and grapevines [16].

Significant funds of grapevine genetic resources exist in Serbia. These are composed of new (contemporary) varieties, old (traditional) varieties, local populations, wild relatives of cultivated varieties and selection materials, i. e. plant breeding materials of actual and potential value for humanity. The *Vitis* gene pool is in the focus of work of three international organizations: OIV — Office International de la Vigne et du Vin; IBPGR — International Board for Plant Genetic Resources, known today as the IPGRI — International Plant Genetic Resources Institute and UPOV — Union pour la protection des obtentions végétales. The need to establish grapevine gene banks in Serbia came about as the consequence of advancements in agriculture and the efforts of producers to cultivate varieties which yield the best financial results in the given moment. On this way that commercially inferior varieties suppressed from production with significant probability that they will be lost forever. This is most frequently the fate of older autochthonous varieties which should be preserved in gene banks [8].

Preservation of grapevine germplasm is necessary because increased urbanization and developments in agriculture are causing the destruction of precious source materials on a daily basis [17]. Unlike many other plant species, seed storage as the method for preservation of grapevine is not possible. All known grapevine varieties are highly heterozygous, which causes great diversity when offspring is grown from seed. There are certain limited possibilities for preservation using the *in vitro* method. This method works by preserving live plants in low positive temperatures with additional treatments with inhibitors which slow not only plant growth, but their entire life cycles as well. Preservation is carried out in sterile conditions and lasts for several years. This procedure is delicate and expensive [8]. Long-term successful preservation of the *Vitis* gene pool is possible *ex situ*, on the field in the so called ampelographic collections. Plants can be successfully cultivated in these collections for up to 30 years and they can simultaneously be used for various research and observations within characterisation and evaluation programs. In addition to the aforementioned, the same plants can be used in breeding programs and for material exchange. Thus, this manner of preservation of the *Vitis* gene pool can be regarded as the most favourable.

## AMPELOGRAPHIC RESEARCH AND AMPELOGRAPHIC COLLECTIONS

Favourable agro-environmental conditions, long tradition of viticulture, dynamic historical development, migrations of peoples and other significant factors have all contributed to the development of a remarkably diverse and valuable grapevine gene pool in the territory of Serbia. Before the arrival of phylloxera, autochthonous varieties which can be classified as *Convarietas Pontica* and *Subconvarietas Balcanica* (Negr.) were dominant in the territory of Serbia. Majority of these varieties were described by Prokopije Bolić 1816 in his book “Soveršen vinodelac” [7]. In the period following the Second World War up to present day, a large number of autochthonous grapevine varieties have disappeared. They were replaced by West European varieties of higher quality, which remain dominant in comparison with our local varieties. Only a small number of autochthonous varieties remain. These are preserved and researched in ampelographic collections (*Vitis* genus gene pools). Small numbers of these varieties have been preserved in old production vineyards, and many of them cannot be identified.

Efforts on collecting and preserving existing genetic resources of the *Vitis* genus have been ongoing for decades within scientific and educational institutions and with support from the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia. These efforts include collection, storage, characterisation, and evaluation of unique genotypes in ampelographic collections, applying the principles and methodologies used by international institutions active in this field [14].

Currently, there are three major ampelographic collections within the *Vitis* genus gene bank in Serbia:

1. Sremski Karlovci — Experimental field of the Novi Sad Faculty of Agriculture, with a total of 737 samples;
2. Radmilovac — Experimental field of the Belgrade Faculty of Agriculture, with a total of 659 samples;
3. Niš — within the Centre for Viticulture and Wine Production Niš, with a total of 336 samples.

The total number of accessions in all collections is 1732, 941 of which are unique genotypes (Table 1).

Genetic origin of samples in mentioned ampelographic collections is different. Out of the total 1,732 samples, *Vitis vinifera* accounts for 1,412 samples, interspecies hybrids account for 318 samples, while other species account for only 2 samples (Table 2). With respect to individual collections, largest number of *Vitis vinifera* samples is located in the Radmilovac collection (584), while the Niš collection has the smallest number of samples (295).

Table 1. Overview of the *Vitis* genus genetic resources in ampelographic collections of Serbia

Collection code	Collection location	Number of samples
SRB 01	Radmilovac	659
SRB 02	Sremski Karlovci	737
SRB 03	Niš	336
Total samples	1,732 (941 unique samples)	

Table 2. Genetic origin of samples in ampelographic collections of Serbia

Species	SRB 01 Radmilovac	SRB 02 Sremski Karlovci	SRB 03 Niš	Total
<i>Vitis vinifera</i>	584	533	295	1,412
Interspecies hybrid	75	202	41	318
Other species	0	2	0	2
Total	659	737	336	1,732

Table 3. Status of samples in ampelographic collections of Serbia

Sample status	SRB 01 Radmilovac	SRB 02 Sremski Karlovci	SRB 03 Niš	Total
Variety population	410	382	176	968
Autochthonous variety	(59)	(63)	(27)	(149)
Clone	191	180	152	523
Valuable genotype	58	175	8	241
Total	659	737	336	1,732

On the other hand, the largest number of interspecies hybrids can be found in the Sremski Karlovci collection (202), while the smallest number can be found in the Niš collection (41).

Data presented in Table 3 shows that the Radmilovac collection houses 410 samples of variety populations, 59 autochthonous varieties, 191 clones and 58 valuable genotypes. The Sremski Karlovci collection houses 382 samples of variety populations, 63 autochthonous varieties, 180 clones and 175 valuable genotypes. The Niš collection houses 176 samples of variety populations, 27 autochthonous varieties, 152 clones and 8 valuable genotypes.

Following tests are conducted for all samples in these collections:

— Ampelographic description including organs: young shoot, woody shoot, mature leaf, flower, bunch and berry. Descriptions are done using OIV, IBPGR and UPOV descriptors;

— Determination of agro-biological characteristics: vegetative cycle, vigour, low temperature resistance, fungal disease resistance, rootstock affinity;



— Determination of economic and technical characteristics: yield, grape and wine quality;

— Molecular characterisation, which includes 9 primer pairs for amplification of mostly SSR genomic regions (VrZAG79, VrZAG62, VVMD32, VVMD28, VVMD27, VVMD25, VVMD7, VVMD5 and VVS2).

Results thus obtained, along with previously collected passport information, are the basis for characterisation and evaluation of examined genotypes. The large number of samples in collections enables them to be used for multiple purposes. They primarily serve as a gene banks and the ultimate goal of plant gene banks is the use of genetic resources for breeding work. In addition, ampelographic collections are used for evaluations of new varieties, clones and newly introduced varieties, for education of students, and grapevine and wine producers, as well as for promotion of grapevine varieties and clones.

## HISTORY AND CURRENT STATUS OF VITICULTURE IN SERBIA

Viticulture is an important branch of the agriculture in the Republic of Serbia. Its history can be traced back to ancient times. Fossil remains of grapevine seeds and remains of wine jars found in archaeological sites along the coast of Danube in Grocka, Vinča and other localities indicate that grapevine was present in the territory of modern day Serbia several thousand years ago. Expansion of viticulture was the consequence of activities of the Thracians and ancient Greek, but first written records on grapevine, its varieties and manner of cultivation can be found in writings of ancient Romans [10]. The expansion of Christianity in early Middle Ages had an especially positive influence on the development of viticulture and winemaking in these territories, in this period old Slavs perfected their winemaking methods. All Medieval Serbian rulers also paid significant attention to viticulture and have thus set the foundation for modern-day wine-growing areas in Serbia.

After the phylloxera crisis was resolved and vineyards rebuilt (after 1880), new vine nurseries were formed in Serbia for production of planting materials by grafting domestic grapevine varieties onto American rootstocks. The need to establish new vineyards was given greater attention at the time and some of the new contemporary methods were introduced. Near the end of the XIX century two dangerous grapevine diseases appeared in Serbia (downy mildew and powdery mildew), as the result, protective measures against said diseases were introduced as mandatory. After the First World War, first generation of hybrid grapevines arrived and started spreading throughout Serbia, these hybrids were resistant to phylloxera and fungal diseases, but their fruit made for poor quality wines (Jacquez, Noah, Sasarosh, Othello and

other), these varieties were later banned from being used for wine production because of the high content of harmful substances. During the first ten years following the end of the Second World War, big changes occurred in the manner of grapevine cultivation. In early sixties of the XX century, the entire Central and Eastern Europe switched to a new method of grapevine cultivation, which was also introduced in Serbia in large socially owned estates. Higher canopies and wider rows were introduced, spacing between vines was most commonly 3 x 1 m, with 3,333 vines per hectare. Grape processing technology was also advancing and new socially owned wine cellars were equipped with modern imported equipment. In the second half of the last century, large socially owned plantations mostly planted introduced West-European varieties used for production of quality white and red wines, while table grape varieties were significantly less common. Viticulture zoning determined that northern regions are to be used for growing varieties for production of white wines, while southern, warmer regions were to be used for production of red wines [2, 10].

It is only in the past twenty years that Serbia saw qualitative advancements in viticulture, especially in privately owned vineyards. Thanks to incentive measures from the state, developments of extension services and activities of educational institutions, the technology for viticulture and wine production was modernised. New technologies were gradually introduced to viticulture, clonally selected and certified planting materials of higher quality were used and the choice of proper varieties, rising and nurturing of vineyards received greater attention. Revitalization of old vineyards in Serbia with autochthonous varieties and growing of new vineyards with autochthonous varieties such as the Prokupac, Smederevka, Bagrina, Tamjanika and others, efforts on clonal and subclonal selection of autochthonous and some of the introduced varieties with longer tradition of growing in these areas [9, 13, 18], indicate that Serbia has begun to recognise its opportunities in making wines from autochthonous grapevine varieties and that this is, if not the only, than certainly one of the more certain ways of drawing attention to Serbia as a country of wine. Although few new vineyards are established on the annual level, what gives encouragement is the fact that contemporary vineyards are established, utilising modern growing methods which are in accordance with conditions and biological requirements of the selected variety. The main accent in production is placed on achieving higher quality, not on producing greater quantities. Simpler vine training systems are used as these are easy for maintenance and lead to less encumbrance. Vineyard density is most frequently between 4,000–5,000 plants per hectare [24]. The integral production concept was gradually introduced and interest is growing among winegrowers for organic production of grapes and wines. Grape processing and wine making



technology was also advanced. Some of the wine producers have reached an enviable level of quality of their products and have begun introducing wines into the geographical indications system.

Today, in the territory of the Republic of Serbia around 22,901 ha (21,201 ha according to statistical data) are under vineyards. Wine grapes are grown on 17,483 ha, or 75.7% of the total areas under vineyards. Varieties grown for table grapes intended for fresh consumption are grown on 4,667 ha or 24.3% of the total areas under vineyards. In the Republic of Serbia, a total of 80,341 agricultural households are engaged in viticulture, which is 12.7% of the total number of agricultural households. Agricultural households engaged in wine-growing have an average of 0,28 ha under vineyards. Average area of vineyards tended by a single household in Central Serbia is 0,23 ha. These areas are significantly larger in Vojvodina with an average of 0,85 ha [10].

## WINE-GROWING REGIONS AND GRAPEVINE VARIETIES IN SERBIA

Serbia owns excellent conditions for grapevine growing, production of grapes and products from grapes. This branch of production should take a prominent place in the total agricultural production, employ a large number of inhabitants and occupy areas with lower soil quality in which other agricultural cultures either cannot be grown or can be grown with less success [24].

In accordance with the zoning of wine-growing geographic areas in Serbia, carried out by the Ministry of Agriculture, Forestry and Water Management as part of a Twinning Project, wine-growing areas in Serbia encompass the entire territory of Serbia at altitudes up to 800 m and certain areas above this altitude which are included in the list of zoned areas with greater altitudes. Wine-growing areas in Serbia can be divided into three large wine-growing large areas, 22 wine-growing regions and 77 wine-growing sub-regions (Figure 1).

Assortment of grapevine varieties in Serbia is composed of varieties of different origin and intended use. In accordance with the zoning, all varieties are classified into following groups: 1. autochthonous and regional varieties; 2. international varieties and 3. domestic bred varieties [10]. Each of these categories serves the needs and requirements of consumers and should have its place in the assortment. International varieties will probably continue to dominate in the domestic assortment, since they produce high quality, globally renowned and recognisable wines. Autochthonous varieties should receive greater attention, highest quality varieties should be chosen, clonally selected and certified them, propagate their massive spread, especially for the purposes of wine tourism. New domestic bred varieties should also garner

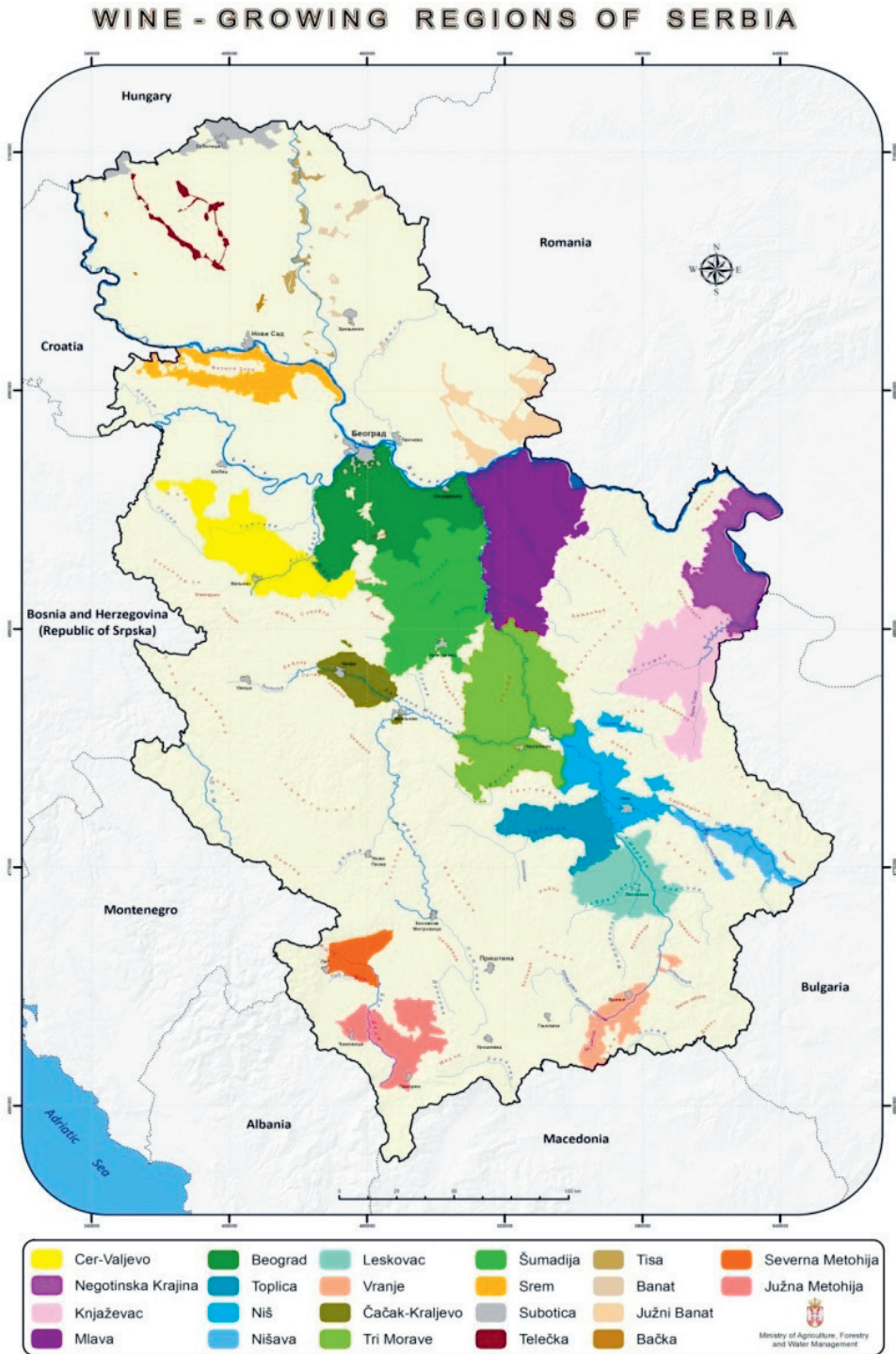


Figure 1. Wine-growing regions of Serbia

greater attention, producers and consumers should be acquainted with their quality and they should be grown in larger areas.

Fifteen of the more important autochthonous and regional wine grape varieties are grown widely in Serbia (Smederevka, Tamnjanika Bela, Sremska Zelenika, Ružica Crvena, Slankamenka Crvena, Bagrina, Muskat Krokan, Kreaca, Ezerjo, Prokupac, Tamnjanika Crna, Kadarka, Furmint, Limberger, Portugieser). Fifteen of the important international wine grape varieties are grown widely in Serbia (Sauvignon, Chardonnay, Rhine Riesling, Muscat Ottonel, Traminer, Pinot Blanc, Pinot Gris, Riesling Italico, Müller Thurgau, Cabernet Sauvignon, Pinot Noir, Merlot, Gamay, Gamay Teinturier, Alicante Henri Bouschet) as well as 8 of the important international table grape varieties (Muscat Hamburg, Cardinal, Chasselas, Ljana, Moldova, Kishmish Moldova, Victoria, Michel Palieri) (Table 4).

Table 4. Most commonly grown autochthonous, regional and international varieties in Serbia

No.	Variety		
	Autochthonous and regional wine grape	International wine grape	International table grape
1.	Smederevka	Sauvignon	Muscat Hamburg
2.	Tamnjanika Bela	Chardonnay	Cardinal
3.	Sremska Zelenika	Rhine Riesling	Chasselas
4.	Ružica Crvena	Muscat Ottonel	Ljana
5.	Slankamenka Crvena	Traminer	Moldova
6.	Bagrina	Pinot Blanc	Kishmish Moldova
7.	Muskat Krokan	Pinot Gris	Victoria
8.	Kreaca	Riesling Italico	Michel Palieri
9.	Ezerjo	Müller Thurgau	—
10.	Prokupac	Cabernet Sauvignon	—
11.	Tamnjanika Crna	Pinot Noir	—
12.	Kadarka	Merlot	—
13.	Furmint	Gamay	—
14.	Limberger	Gamay Teinturier	—
15.	Portugieser	Alicante Henri Bouschet	—

A significant number of leading varieties in production of many countries is composed of relatively new varieties created through breeding work. Great advancements have been made with respect to the quantity of yields and size and quality of the grape from wild predecessors to today's contemporary grapevine varieties. This is the consequence of high variability of hereditary characteristics of the grapevine and successful breeding work [17].

In the sixties of the previous century, work was started on creation of new grapevine varieties in Serbian scientific institutions (Belgrade, Novi Sad and Niš). In course of the sixty years of breeding work thus far, 75 new varieties and clones have been created and recognised in Serbia and these represent significant grapevine genetic resources (Table 5).

Table 5. Overview of domestic newly created varieties in Serbia

Variety	Institution			Total
	Faculty of Agriculture Belgrade	Faculty of Agriculture Novi Sad	Centre for Viticulture and Wine Production Niš	
<b>Wine</b>	10	21	2	33
<b>Table</b>	18	2	0	20
<b>Clone</b>	12	10	0	22
<b>Total</b>	40	33	2	75

Experimental field of the Belgrade Faculty of Agriculture produced 10 wine grape varieties, 18 table grape varieties and 12 clones of the Prokupac variety. Experimental field of the Novi Sad Faculty of Agriculture produced 21 wine grape varieties, 2 table grape varieties, 6 clones of the Riesling Italico variety, and 4 clones of the Župljanka variety. The Centre for Viticulture and Wine Production from Niš produced two wine grape varieties. In total, Serbia produced 33 wine grape varieties, 20 table grape varieties and 22 grapevine clones. Some of the newly created varieties were examined in detail and described by many authors [2, 3, 4, 5, 6, 7, 11, 12, 21]. Some of these varieties have expanded greatly in Serbia and some are grown in other countries as well.

Table 6 shows that of the newly created varieties, 17 wine grape varieties are widely grown in Serbia as well as 9 table grape varieties (Beogradska Rana, Demir Kapija, Gročanka, Radmilovački Muskat, Smederevski Muskat, Srbija, Beogradska Besemena, Lasta, Karmen). Among the newly created domestic varieties three wine grape varieties should be especially mentioned (Vožd, Vladun, Dionis) as should three table grape varieties (Kalina, Despina, Antonina) which were all recognised in March 2017 and are expected to quickly gain a prominent place in production in Serbia.

Since the existing assortment of *Vitis vinifera* L. varieties, despite large numbers, is not satisfactory from the current economic perspective or from the perspective of contemporary consumption of grapes, wine and grape and wine products, creation of new varieties and enrichment of the existing genetic resources are given great attention in Serbia [17]. Experimental fields in Sremski Karlovci, Radmilovac and Niš contain of seedlings collections

Table 6. Most commonly grown domestic newly created wine and table grape varieties in Serbia

No.	Variety	
	Newly created wine grape	Newly created table grape
1.	Župljanka	Beogradska Rana
2.	Neoplanta	Demir Kapija
3.	Godominka	Gročanka
4.	Kladovska Bela	Radmilovački Muskat
5.	Sila	Smederevski Muskat
6.	Petra	Srbija
7.	Liza	Beogradska Besemena
8.	Petka	Lasta
9.	Rubinka	Karmen
10.	Bačka	—
11.	Panonija	—
12.	Morava	—
13.	Probus	—
14.	Jagodinka	—
15.	Negotinka	—
16.	Župski Bojadiser	—
17.	Krajinski Bojadiser	—

with numerous genotypes created through intensive breeding work. A certain number of new genotypes from these collections are currently undergoing the recognition procedure and new crossings are carried out with the aim of selection of new promising genotypes with greater yields, grape quality and resistance to fungal diseases and other pests.

## CONCLUSION

Genetic diversity of grapevine in Serbia is remarkably high. Three major institutions in Serbia are engaged in preservation of genetic resources of the grapevine: Faculty of Agriculture in Novi Sad, Faculty of Agriculture in Belgrade and the Centre for Viticulture and Wine Production in Niš. The total number of accessions in all collections amount to 1732, 941 are unique genotypes. All varieties in these collections are divided into three groups: 1. autochthonous and regional varieties, 2. international varieties and 3. domestic bred varieties. Out of these abundant genetic resources, autochthonous varieties and new domestic varieties are of special importance, for which it is expected that they will enter production in Serbia and spread quickly.



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## GENETIČKI DIVERZITET VINOVE LOZE U SRBIJI

### *Sažetak*

U radu je dat pregled genetičkog diverziteta vinove loze u Srbiji. Trenutno postoje tri velike ampelografske kolekcije u okviru biljne banke gena za rod *Vitis* u Srbiji: 1. Sremski Karlovci — Eksperimentalno polje Poljoprivrednog fakulteta Univerziteta u Novom Sadu, sa ukupno 737 uzoraka; 2. Radmilovac — Eksperimentalno polje Poljoprivrednog fakulteta Univerziteta u Beogradu, sa ukupno 659 uzoraka i 3. Niš — Centar za vinogradarstvo i vinarstvo Niš, sa ukupno 336 uzoraka. Ukupan broj aksešna u svim kolekcijama je 1732, od čega je 941 jedinstveni genotip. Sortiment vinove loze u Srbiji se sastoji od sorti različitog porijekla i upotrebe. Po porijeklu, sve sorte svrstavaju se u sljedeće grupe: 1. autohtone i regionalne sorte, 2. međunarodne sorte i 3. domaće sorte. Od važnih autohtonih i regionalnih sorti, u značajnoj količini se gaji 15 sorti vinove loze, dok su međunarodne sorte zastupljene sa 15 vinskih sorti i 8 stonih sorti koje se gaji u značajnim količinama. Oplemenjivački napori u Srbiji do sada su rezultirali stvaranjem 75 novih sorti i klonova koji predstavljaju značajne genetske resurse vinove loze. Od pomenutih novostvorenih domaćih sorti, u značajnoj količini se gaji 17 vinskih sorti i 9 stonih sorti. Bez obzira na postojeći diverzitet, genetske resurse vinove loze treba i dalje obogaćivati zbog njihovog značaja za razvoj vinogradarstva u cjelini u Srbiji.

*Ključne riječi:* vinova loza, diverzitet, ampelografska kolekcija, vinogradarstvo, Srbija