

WILD GRAPEVINE (*VITIS VINIFERA SUBSP. SYLVESTRIS*) IN THE DANUBE BASIN OF THE SOUTHERN OLTEÑIA (ROMANIA): CHOROLOGY, ECOLOGY, CONSERVATION AND AN IMPORTANT RESOURCE FOR VITICULTURE

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Abstract

The wild grapevine (*Vitis vinifera subsp. sylvestris*) is a woody vine, widespread through out most of Eurasia. In Romania this wild vine is found sporadically, entering the floristic composition of the woody plant communities of meadows, in the plain and hilly areas, on the banks of the waters, preferring alluvial soils. In southern Oltenia, the most important populations are found in the Danube meadow, in the lower Jiu basin but also at the Jiu-Danube Confluence. Following population studies, it was found that in general, the identified populations consist of less than ten individuals, with variable vigor, depending on ecological and anthropogenic factors, and the distances between populations vary, ranging from a few tens of meters to hundreds of meters. In southern Oltenia, the distribution area of wild grapevine is very fragmented. From a phytosociological point of view, wild grapevine populations have been identified in the floristic composition of the following plant communities: Salici-Populetum Meijer-Drees 1936, Stellario nemorum-Alnetum glutinosae (Kästner 1938) Lohmeyer 1957, Carici remotae-Fraxinetum Koch ex Faber 1936, Salicetum albae Issler 1924, Fraxino pallisae-Quercetum pedunculiflorae (Popescu et al. 1979) Oprea 1997, Quercetum roboris pedunculiflorae Simon 1960 (syn.: Fraxino angustifoliae-Quercetum pedunculiflorae Chifu et al. (1998) 2004). Although this wild vine can reproduce vegetatively, it has been observed by specialists that in the longterm there is a risk of senescence and genetic weakening of populations. Given global climate change, the anthropogenic factors that threaten wild vine populations need to be defined in order to impose effective protection measures for wild grapevine. Considering the importance of conserving the genetic resources of wild grapevines at a European level and beyond, he believes that the chorological, population, phytosociological, and ecological studies carried out in the Danube and Jiu basins, including the Jiu-Danube Confluence, have an essential role both for the conservation of biodiversity and for viticulture.

Key words: wild grapevine, Oltenia, *Vitis vinifera subsp. sylvestris*, forest habitats, Jiu-Danube Confluence

INTRODUCTION

The wild grapevine (*V. vinifera subsp. sylvestris*) is a woody vine, widespread throughout most of Eurasia. In Romania this wild vine is found sporadically, entering the floristic composition of the woody plant communities of meadows, in the plain and hilly areas, on the banks of the waters, preferring alluvial soils. In southern Oltenia,

the most important populations are found in the Danube meadow, in the lower Jiu basin but also at the Jiu-Danube Confluence (fig. 1). Following population studies, it was found that in general, the identified populations consist of less than ten individuals, with variable vigor, depending on ecological and anthropogenic factors, and the distances between populations vary, ranging from a few tens of meters to

hundreds of meters. In southern Oltenia, the distribution area of wild grapevine is very fragmented.

Taxonomy:

Regnum: *Plantae*

Phylum: Spermatophyta

Subphylum: Magnoliophytina (Angiospermeae)

Classis: Magnoliatae (Dicotyledoneae)

Subclassis: Rosidae

Ordo: Rhamnales (Vitales)

Familia: Vitaceae

Species: *Vitis vinifera*

Subspecies: *Vitis vinifera* ssp. *silvestris*

Vitis vinifera ssp. *silvestris* (Wild grapevine) dates back to early Holocene (around 10 000 years ago). It was first described by Christian Gmelin (1806), based on the forms he encountered alongside Rhine river.



Fig. 1. *Vitis vinifera* ssp. *silvestris* and *Vitis vinifera* ssp. *sativa* leaf seed and cluster

MATERIALS AND METHODS

The researched territory is located in southern Oltenia area, at the Jiu-Danube Confluence, Dolj County. In order to identify the infrataxon - *Vitis vinifera* ssp. *silvestris* we looked into: Romanian Flora, vol. I-XII (1952-1976), Flora Europaea, vol. I-V

(Tutin, T. G. et al., 1964-1980). *Vitis vinifera* ssp. *silvestris* have been analyzed and characterized from the chorological, ecological and conservation status point of views.

RESULTS AND DISCUSSIONS

Vitis vinifera ssp. *silvestris* is widespread on forests periphery, mostly in areas with increased humidity and in river valleys. Compared to *Vitis vinifera* ssp. *sativa* it grows better in areas with increased soil moisture (table no. 1).

Table no. 1- *Vitis vinifera* ssp. *silvestris* and *Vitis vinifera* ssp. *sativa* - morpho-anatomical characteristics

Ampelographic characteristic	<i>Vitis vinifera</i> ssp. <i>silvestris</i>	<i>Vitis vinifera</i> ssp. <i>sativa</i>
Vigour	Low to Medium	Low, medium and high
Leaf	Different forms of small to medium with 3 or 5 lobes (depend of position)	Small to large with 3 to 5 lobes
Flowers	Separated male and female flowers	Hermaphrodite (some varieties and rootstock had male or female flowers)
Grape	Small, loose	Varying size and tightness
Berry size	Very small, round	Bigger size and different shape
Berry color	White or dark red	Different nuance of white to red colour
Seed	Very small, round, short and hard	Varying size, long and soft
Disease resistance	Low	Medium to high

Opinions differ on frost resistance of wild grapevine. The spread of phylloxera and powdery and downy mildew, as well as

urbanization and increased land usage, have contributed to population decrease and endangerment.

The population of *Vitis vinifera* ssp. *silvestris* spreads from Portugal (Iberian peninsula) across Central and Southern Europe, North Africa (The Mediterranean coast) and in countries of Southwestern (Iran, Turkmenistan) and Western Asia (Black sea area).

In Romania *Vitis vinifera* ssp. *silvestris* it is found in meadow forests. It can be found in Danube valleys as part of forest stands, alongside Serbian-Romanian border, and towards Danube Delta.

Due to dominance of cultivated vines it is survived only in certain less accessible zones. In southern Oltenia, the most important populations are found in the Danube meadow, in the lower Jiu basin but also at the Jiu-Danube Confluence.

From a phytosociological point of view, wild grapevine populations have been identified in the floristic composition of the following plant communities:

- ✓ *Salici-Populetum* Meijer-Drees 1936;
- ✓ *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957;
- ✓ *Carici remotae-Fraxinetum* Koch ex Faber 1936;
- ✓ *Salicetum albae* Issler 1924;
- ✓ *Fraxino pallisae-Quercetum pedunculiflorae* (Popescu et al. 1979) Oprea 1997;
- ✓ *Quercetum roboris pedunculiflorae* Simon 1960 (syn.: *Fraxino angustifoliae-Quercetum pedunculiflorae* Chifu et al. (1998) 2004).

Wild grapevine grew abundantly in natural habitats in the Jiu and Danube basins, where ecological conditions are favorable, the most developed populations are found especially in phytocoenoses of plant communities: *Salici-Populetum* Meijer-Drees 1936 and *Salicetum albae* Issler 1924.

Following the studies carried out, it was found that the highest abundance-dominance of wild grapevine was recorded in the phytocoenoses built up by willow and poplar in the Jiu-Danube Confluence area (table no. 2).

Although this wild vine can reproduce vegetatively, it has been observed by specialists that in the long term there is a risk of senescence and genetic weakening of populations.

Given global climate change, the anthropogenic factors that threaten wild vine populations need to be defined in order to impose effective protection measures for wild grapevine.

Considering the importance of conserving the genetic resources of wild grapevines at a European level and beyond, he believes that the chorological, population, phytosociological, and ecological studies carried out in the Danube and Jiu basins, including the Jiu-Danube Confluence, have an essential role both for the conservation of biodiversity and for viticulture.

Vitis vinifera ssp. *silvestris* uses:

- in a past before the *Vitis vinifera* ssp. *sativa* domestication in a diet and for wine production;
- it is important for genetic diversity, conservation and breeding programs (Perko et al., 2024);
- cross-breeding resource for developing new rootstocks/varieties/hybrids with increased abiotic stress resistance (Daldoul et al., 2025);
- pollinators of female *V. vinifera* ssp. *sativa* cultivars (Maghradze et al., 2020);
- microvinification – good colour intensity and acidity (Rustioni et al. 2021), phenols reach resource;
- as medicinal plant high valuable resource.

Salici-Populetum Meijer-Drees 1936

Table no.1

No.of relevée	1	2	3	4	5	K
Coverage (%) (tree layer)	70	70	70	70	60	
Coverage (%) (herbaceous layer)	60	60	50	60	60	
Surface (m²)	1000	1000	1000	1000	1000	
Char. Ass.						
<i>Salix alba</i>	2	2	1	1	1-2	V
<i>Populus alba</i>	3-4	3-4	4	4	3-4	V
Salicion triandrae						
<i>Salix triandra</i>	-	+	+	-	-	II
<i>Calistegia sepium</i>	+	+-1	+	-	-	III
<i>Aegopodium podagraria</i>	+-1	1	1-2	1	1	V
<i>Agrostis stolonifera</i>	1	+-1	1	2	2	III
<i>Urtica dioica</i>	1	1	1	2	2	V
<i>Poa trivialis</i>	-	1	1	+-1	+-1	IV
<i>Rubus caesius</i>	+	+	+	+	+	V
Salicetalia et Salicetea purpurea						
<i>Populus nigra</i>	-	-	+	+	+	III
<i>Salix fragilis</i>	+	+	-	+	+	IV
<i>Salix purpurea</i>	-	+	+	+	-	III
<i>Ranunculus repens</i>	+	1-2	+-1	1	1	IV
<i>Stachys palustris</i>	+	-	-	-	+	II
<i>Cornus sanguinea</i>	+	+	+	+	+	V
<i>Poa palustris</i>	-	+-1	+-1	-	-	II
<i>Lysimachia nummularia</i>	1	1-2	+-1	1-2	1	V
<i>Glechoma hederacea</i>	+-1	+	-	+	-	III
<i>Solanum dulcamara</i>	+	-	-	-	+	II
<i>Vitis vinifera</i> ssp. <i>silvestris</i>	2	2	1-2	1	1	V
Phragmitetalia						
<i>Lycopus europaeus</i>	+	+	-	+	-	III
<i>Lythrum salicaria</i>	+	-	+	-	-	II
Variae Syntaxa						
<i>Rubus caesius</i>	+	-	+	+	+	IV
<i>Sicyos angulatus</i>	2	1-2	2	3	3	V
<i>Phytolacca americana</i>	+	+	+	1-2	1	V
<i>Ailanthus altissima</i>	+	+-1	+	+	1	V
<i>Ambrosia artemisiifolia</i>	-	-	+	-	+	II
<i>Echinocystis lobata</i>	1	1	1	+	+	V
<i>Amorpha fruticosa</i>	3	2	1	2	2	V
<i>Conyza canadensis</i>	+	+	+	+	+	V
<i>Erigelon annuum</i> ssp. <i>annuum</i>	+	+	+	+	+	V
<i>Aster lanceolatus</i>	1	2	1	1-2	1	V
<i>Mentha longifolia</i>	-	+	+	+	+	IV
<i>Ranunculus ficaria</i>	+-1	+	-	-	+	III
<i>Conium maculatum</i>	+	+	+	+	+	V
<i>Polygonum hidropiper</i>	+	-	+	-	+	III

Place and data of relevés: 1-5, Jiu-Danube Confluence, 12.06.2024

We can say, however, that the drought of recent years has caused a decrease in the populations of this infrataxon in all meadow forests but especially in those built up by *Alnus glutinosa*, *Quercus pedunculiflora*, *Fraxinus angustifolia* where the abundance-dominance of the species is much lower within the phytocoenoses.

Regarding population and morphological studies in the studied area, populations with a higher number of individuals were identified in the area of meadow forests, closed, shadier, with increased humidity, and alluvial soils, the individuals being much more vigorous, better developed, with larger foliage, the tallest vine reaching up to 22.5 m. Populations with a reduced number of individuals are found in forest habitats located further from the water's edge and especially in areas where the water table is at a greater depth, here individuals with a height of less than 2.5 m are also identified. From a conservation point of view, wild grapevine participates in the formation of the floristic structure of plant communities that build natural habitats: 91E0* - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)(CLAS. PAL.: 44.3, 44.2 and 44.1); 91F0 - Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers (*Ulmion minoris*)(CLAS. PAL.: 44.4) and 92A0 - *Salix alba* and *Populus alba* galleries (CLAS. PAL.: 44.141, 44.162 și 44.6).

This is of interest regarding the correct implementation of management measures in the analyzed forest habitats, especially since these are an integral part of the Protected Natural Areas - ROSAC0045 Jiului Corridor, ROSPA0023 Jiu-Danube Confluence and Zăval Forest-IV.33 Nature reserve.

CONCLUSIONS

In the researched area of the Jiu and Danube basin, in southwestern Romania,

wild life was identified and analyzed from a chorological, ecological and phytosociological point of view.

The recent impacts of climate change, especially the increase in temperatures and prolonged droughts that occurred in southern Oltenia, in the Danube and Jiu basins, have had a particularly negative impact on wild grapevine populations, recording significant decreases in the number of individuals as well as in the chorology of the infrataxon by reducing its distribution area. However, in the phytocenotic structure of some plant communities, especially those built by *Salix alba*, *Populus alba*, located in the immediate vicinity of the riverbeds, the populations have been much better preserved.

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