CURRENT SITUATION OF *VITIS SYLVESTRIS* IN CROATIA

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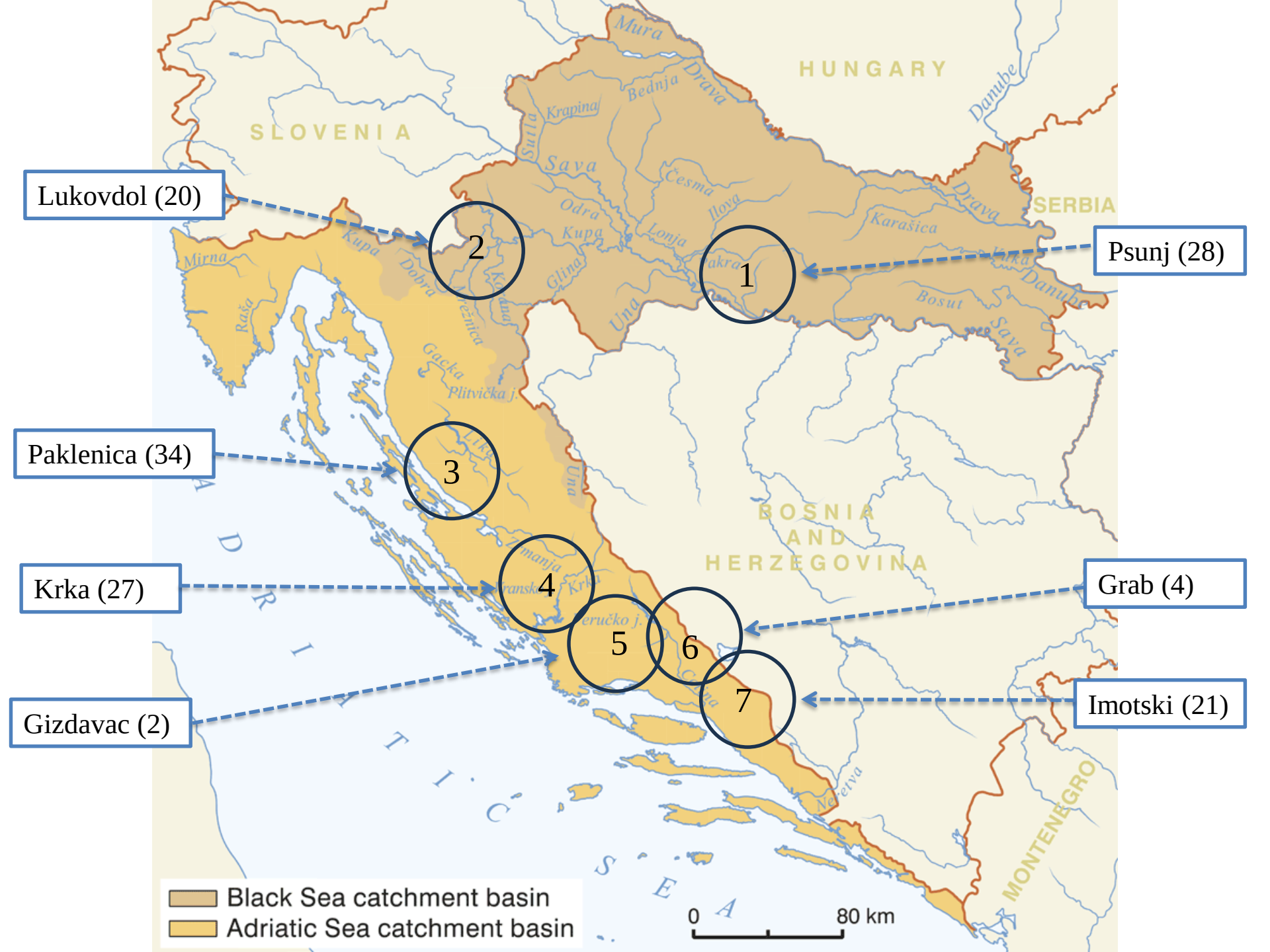
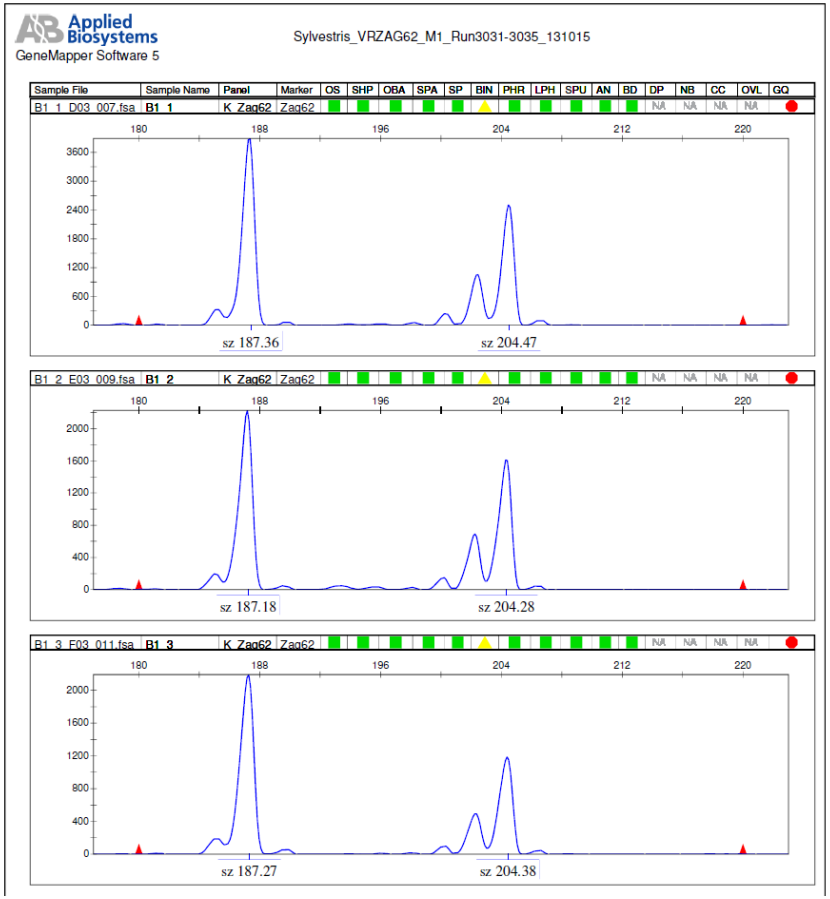
ECPGR Sylvestris Activity meeting
10 - 11 October 2023, Kavala, Greece


Lukovdol (20)
Paklenica (34)
Krka (27)
Gizdavac (2)
Psunj (28)
Grab (4)
Imotski (21)
1
2
3
4
5
6
7
HUNGARY
SLOVENIA
SERBIA
BOSNIA AND HERZEGOVINA
MONTENEGRO
Mura
Drava
Bednja
Krapina
Sutla
Sava
Česma
Ilova
Odra
Kupa
Lonja
Glina
Una
Karašica
Bosut
Danube
Mirna
Raša
Dobra
Gacka
Plitvička j.
Lika
ADRIATIC SEA
Neretva
Black Sea catchment basin
Adriatic Sea catchment basin
0
80 km

Methods

- Prospection, GPS coordinates (WGS84) recorded for each individual observed
- Phenotyping methods – observation of shoot, leaves and clusters, OIV descriptors (OIV, 2009)
- Genetic analysis: 20 SSR markers in 7 multiplex
- Descriptive statistics, PCoA, CA analysis (GenAlex 6.5; Mega 6.0)



Karstic area

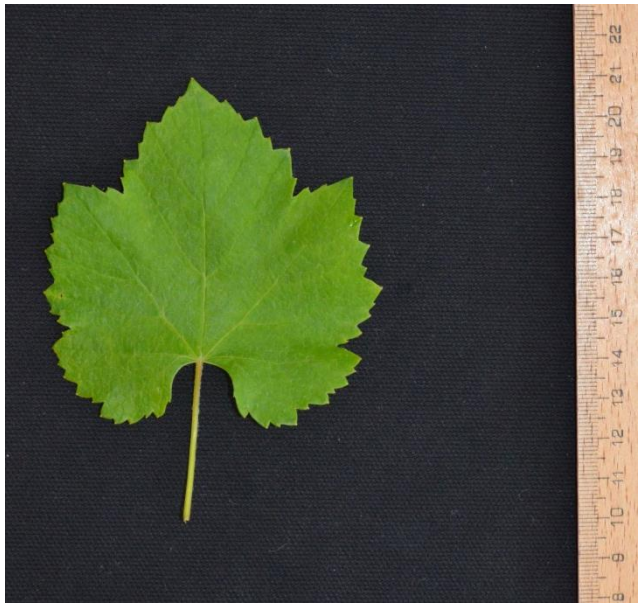
Psunj – deep wood

Flower type

♂ Male

♀ Female

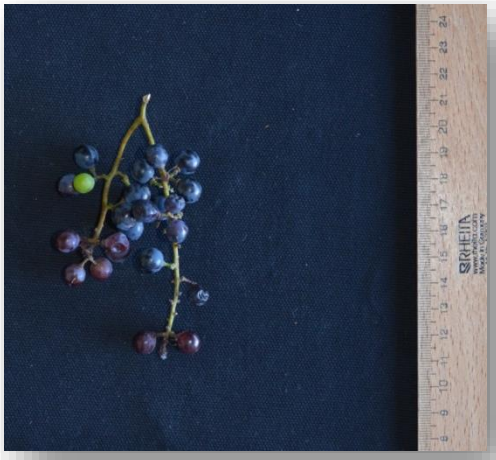
Leaf and bunch morphology



Gizdavac G1

Neretva NE04-10

Paklenica PK1



Bunch dimensions

	cultivars (n=400)				*sylvestris* (n=385)			
	Mean	Min	Max	StDev	Mean	Min	Max	StDev
Cluster length (cm)	20.6	8.2	38.9	5.0	**9.3**	3.4	17.5	2.1
Cluster width (cm)	12.7	5.4	27.7	3.5	**5.4**	2.9	11.1	1.6
Cluster weight (g)	307.4	26.8	955.7	168.6	**14.1**	1.0	43.7	7.3
Rachis fresh weight (g)	15.6	0.1	182.3	15.6	**1.2**	0.3	3.5	0.6
Berries weight (g)	258.4	23.5	923.9	141.7	**12.9**	0.4	42.7	6.9
Number of berries	167	10.0	1000.0	108.3	**34**	7.0	83.0	14.5

Non-*sylvestris* individuals within population

- Rootstocks, cultivars, hybrids
- Registered within each population observed

1. Distinctive morphology

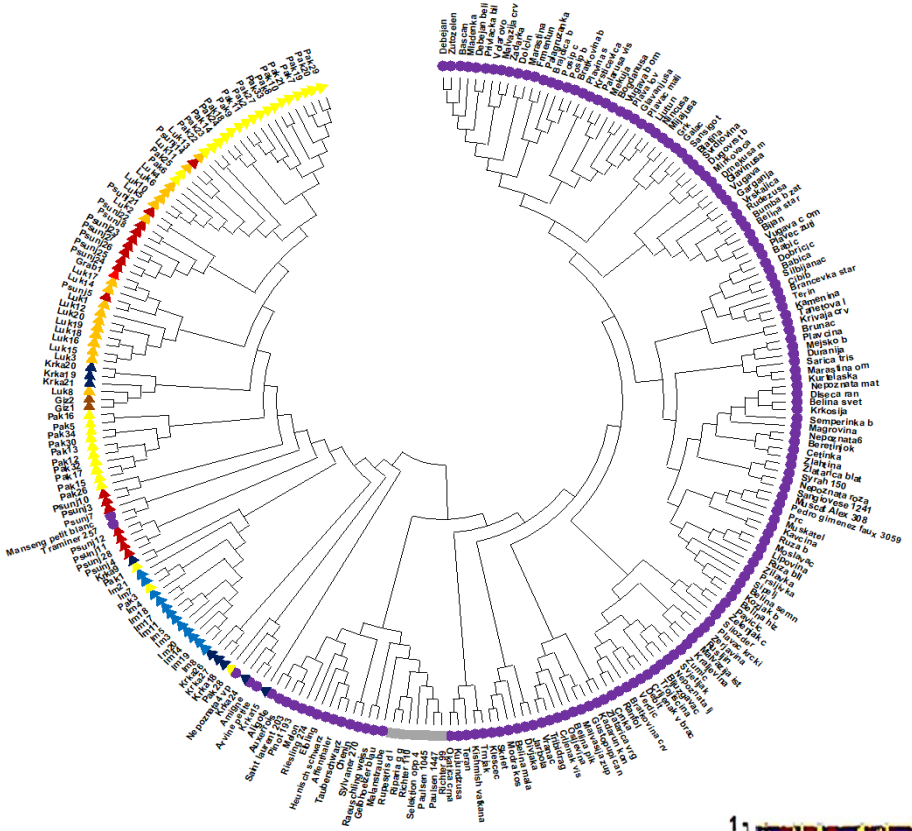
2. SSR unspecific alleles, cluster analysis, parent-offspring test

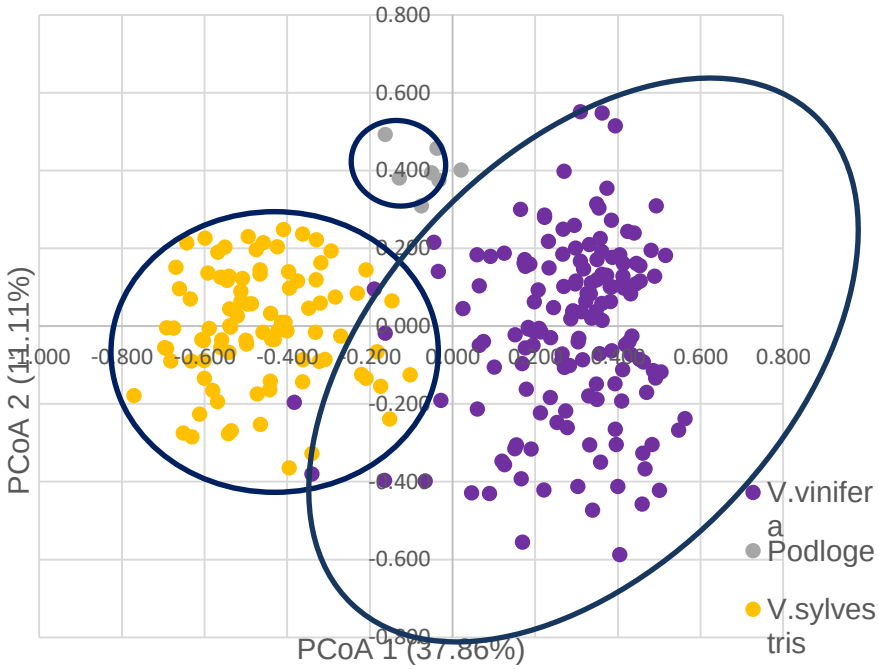
♂♀

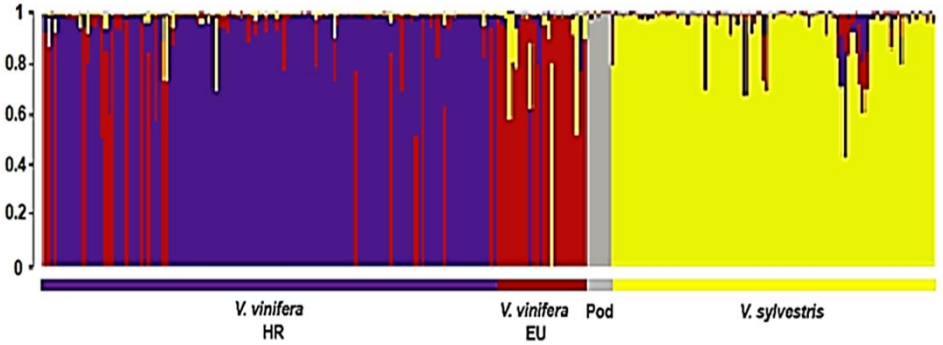
♀

♂

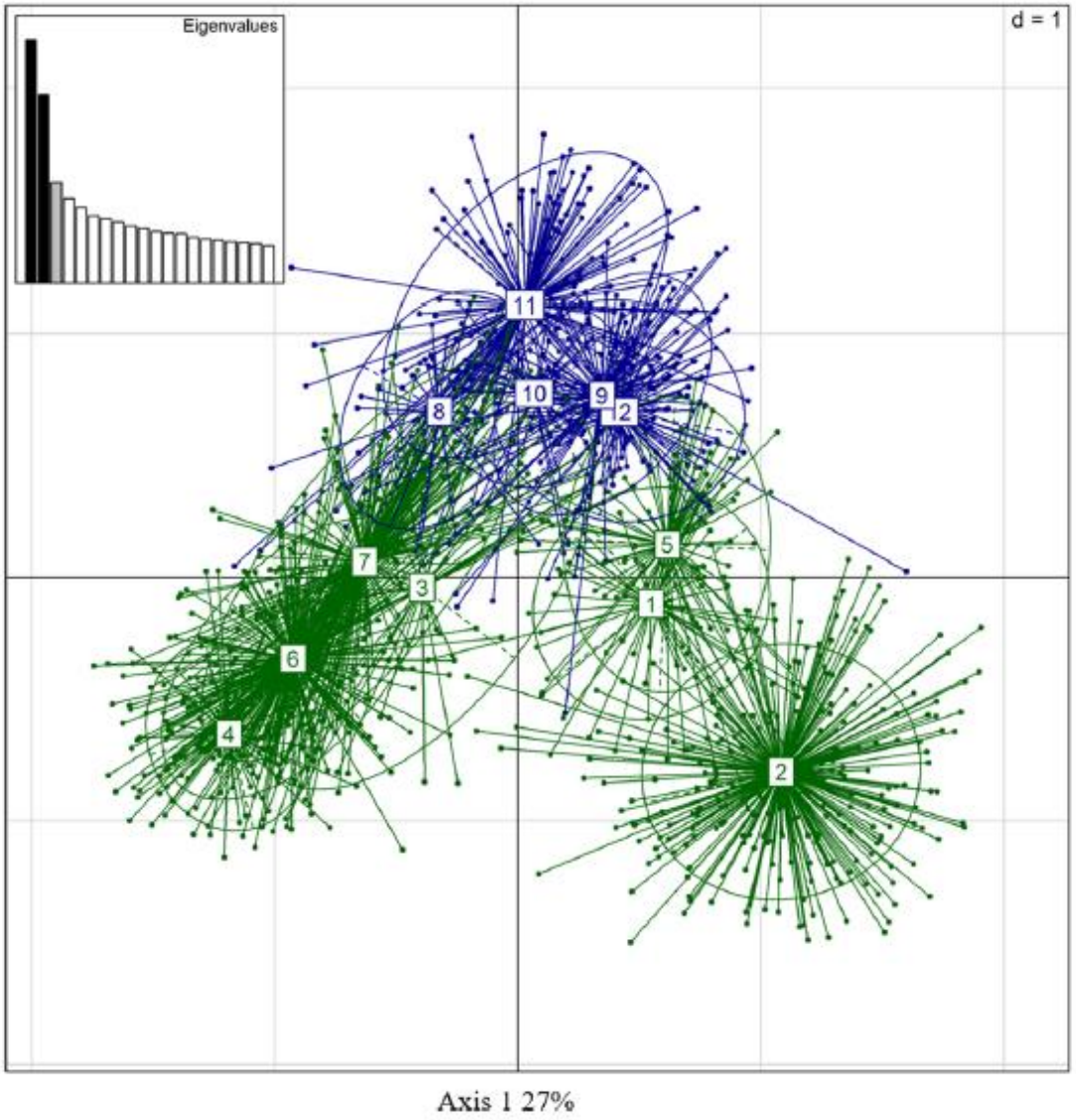
Genetic relationship between sylvestris and cultivated genotypes







Comparison Croatian *sylvestris* with other European populations



Wild populations:

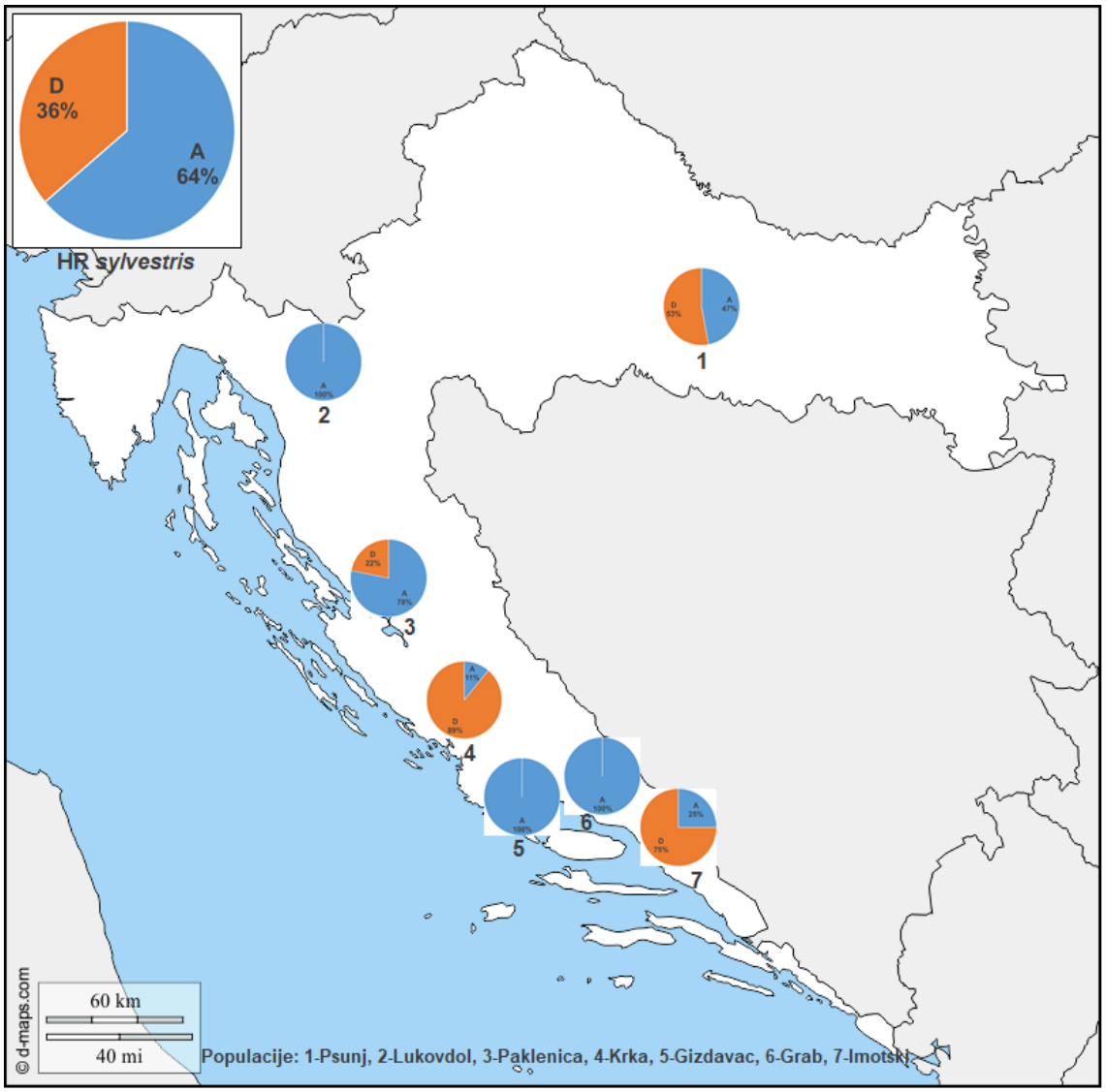
1 Armenia
2 Azerbaijan
3 Croatia
4 France
5 Georgia
6 Italy
7 Spain

Cultivated populations:

8 France
9 Georgia
10 Italy
11 Spain
12 Pakistan - Turkmenistan

Riaz et al in BMC Plant Biol (2018)

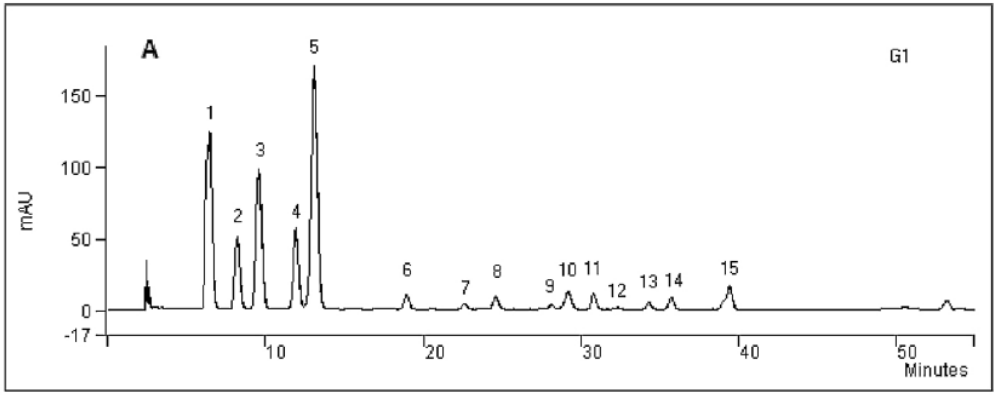
Chlorotype diversity of *sylvestris*; overall: A = 64%, D = 36%

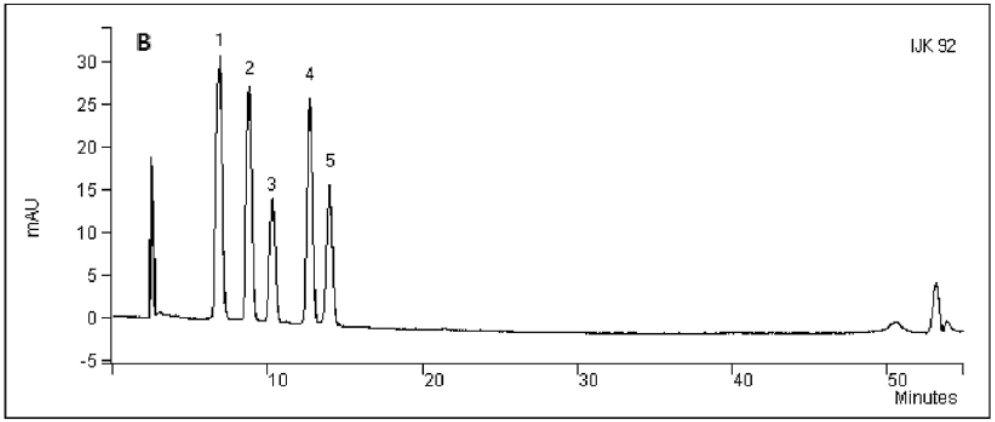


Butorac et al in PLoS One (2018)

Beneficial traits in *sylvestris*

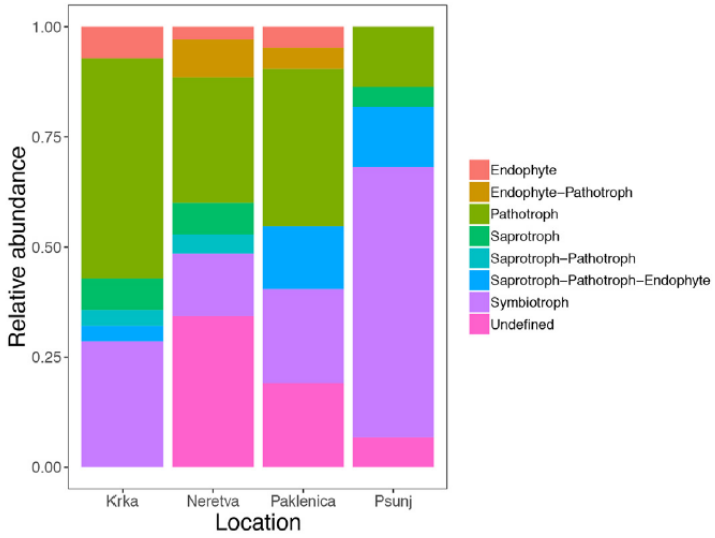
- Two wild genotypes lacked acylated forms of anthocyanins





Budić-Leto et al in Sci Hortic (2018)

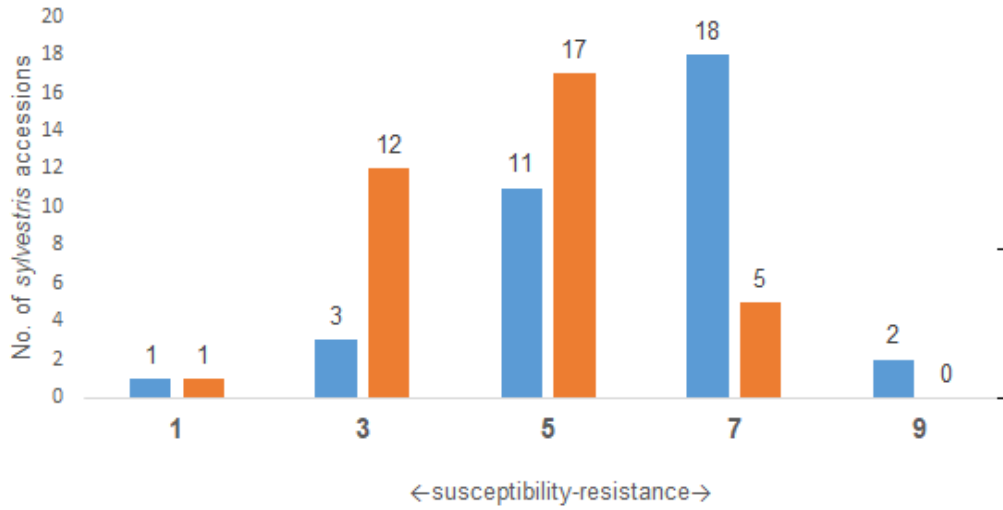
- High taxonomic diversity Root-associated fungal communities



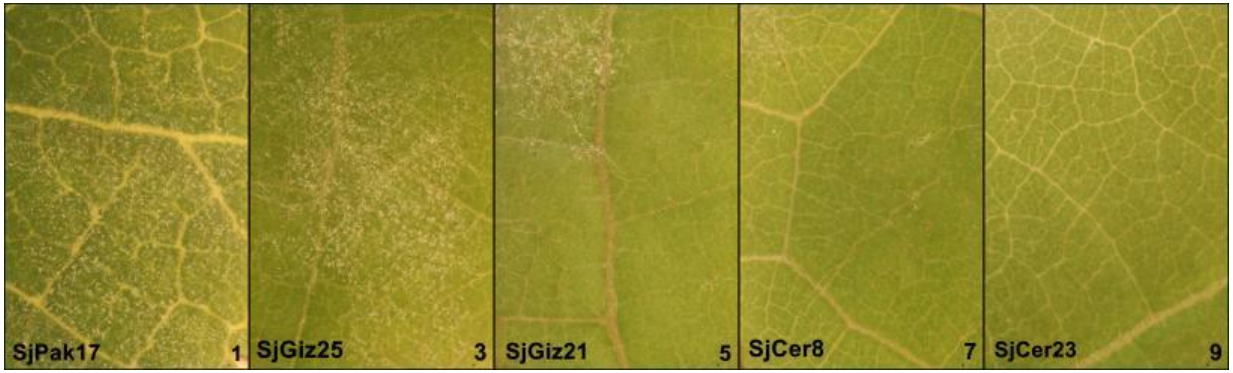
Radić et al in Fungal Ecol (2021)

Resistance to Erysiphe necator

At SSR locus SC47-18 presence of resistance alleles 239 and 246 within Croatian sylvestris



	2018	2019
PMS accession 39	5	5
PSP accession 01	9	3
PSP accession B2	9	7
RKTC accession 02	7	1



Lukšić et al in Sci Rep (2022)

Conclusions

- Clear distinction between *sylvestris* and *sativa* based on leaf and cluster morphology
- Non-*sylvestris* individuals (rootstocks, cultivars, hybrids) observed in each population; 19% tested non-sylvestris
- Distance and model-based cluster analysis differentiated among genotypes
- Morphology seems powerful tool for discrimination between two subspecies (OIV151 Flower type, OIV079 Petiole sinus, OIV082 Lateral sinus, OIV076 Shape of teeth = diagnostic descriptors, *in situ*)
- Conservation and protection of biodiversity – highly needed – *ex situ* germplasm collection


THANK YOU