

# Recovery and sanitary selection of local vines of the Sardinia

Vanda A. Prota, Aimone Sechi, Giovanni Tolu, Raimondo Garau, Ulisse Prota  
Dipartimento di Protezione delle Piante sez. di Patologia vegetale, Università di Sassari  
Via De Nicola 1, 07100 Sassari, ITALY  
[vprota@uniss.it](mailto:vprota@uniss.it)

**Abstract** – A study was made on the recovery genotypes local grapevine with the aim to conserve them and to evaluate their health *status* and thus to improve the quality of the propagation material. Clone accessions of 61 vines were grafted and placed in a germoplasma field. The varieties that were considered enologically valuable were subjected to sanitary selection. Some vines showed indubitable healthy qualities, and should be immediately evaluated from an economical point view and then certificated. Possible sanitation treatments were also evaluated, with the aim of extending the number clone accessions to be included in experimental trials to access their yield .

Keywords: grapevine, biodiversity, sanitary *status*, sanitary improvement

## INTRODUCTION

The current tendency to increase of the international vine varieties cultivation has encouraged businessmen to unidirectional options leading to the marginalization of local varieties. To the contrary the protection of local genetic resources cultural heritage should be particularly stressed.

The need to recover and improve the value to the local viticultural heritage is of particular importance in different regional viticultural realities.

In this context here we present a survey on the sanitary condition of some minor *Vitis vinifera* varieties recovered in Sardinian areas with special enological characters and global importance for wine production.

## MATERIALS AND METHODS

The investigation was carried out in 2004 and took place in different wine districts of Sardinia. Some aspects related to the sanitary conditions of specific grapevine varieties were studied. In particular, the sanitary conditions of four white varieties (Arvesionadu, Semidano, Redagliadu and Moscato) and six reds (Bovaleddu, Nieddera, Girò, Gregu nieddu, Caricajola and Carenisca) were investigated. Plants were monitored in the fields (located in the place of origin of each variety) in different periods of year. Asymptomatic plants were identified and subjected to standard immuno-enzymatic tests in the laboratory to establish their health *status* [1].

The diagnostic tests were aimed to identify the “fanleaf” virus (GFLV), the associated “leafroll” viruses (GLRaV-1, GLRaV-2, GLRaV-3 and GLRaV-7), the virus A (GVA), and the “fleck” virus of grapevine (GFkV). The presence of “*Rupestris* stem pitting” (RSP) components of “Rugose

wood complex” was tested on *V. Rupestris* as previously described [2]. This test was carried out on approximately 20 clones per cv. The absence of the etiological agents (cited above) was used as a quality index to select candidate plants for the production of propagation material [3], [4].

Possible strategies were evaluated for short or medium term improvement, depending on the results obtained.

## RESULTS

Sixty-one varieties were identified in their area of origin (30 whites and 31 red) (Tab. 1). All of them (on a clone basis) were grafted and collocated *ex situ*, in order to make up a field of germplasm, that is currently monitored for health conditions as well as used in program for vine varieties improvement.

The sanitary investigation on the selected cultivars (Tab. 2) gave discordant results. The most affected were the white variety Nasco and the red Gregu nieddu varieties. Both of them presented the highest number of viruses tested. On the contrary encouraging results were found for the red cv Carenisca, and the white cv Redagliadu. These last varieties were in an optimal health condition with the exception of GLRaV-3 ampelovirus for Carenisca, which was positive for this virus in 26% of cases, and GLRaV-2 closterovirus for Redagliadu, positive for this virus in 24% of cases. There was a poor infection of GFLV nepovirus, “fanleaf” grapevine agent, with the exception of the Girò cv. The GLRaV-7, associated with “leafroll” was always found absent. By contrast there was a great difference in the presence of all the other viral species in the other varieties, and the infection levels were medium-high.

## CONCLUSIONS

This study confirmed that minor genotypes of *Vitis vinifera* could be recovered in Sardinia. Some of these are confined to old vineyards, and grown in an increasingly limited area with significant risk of extinction. They can be considered as a valuable gene bank and surely they reserve suitable study in order to improve their enological value. The aggregate of their characteristics is expressed by their versatility or adaptability to environmental limits, in terms of the culture and tradition of the Region.

This study, designed to improve the quality of the propagation material, highlighted that recovery interventions and resanitation were indeed necessary.

The results suggest short and medium term prospects for interventions. The best varieties such as Redagliadu and

Carenisca could be included in the certification *iter* and at the same time into a more organic investigation program aimed to define their sanitary conditions and enological

qualities. The remaining varieties need to be involved in genetic and sanitary improvement programs with the prospective of new developments for the enological sector.

Tab. 1. Varieties or presumed varieties, raised in a camp of germoplasma *ex situ*, traced in different viticultural areas of Sardinia.

White varieties		Red varieties	
Albaranzeliadu	Malvasia di B.	Aleatico	Mara
Albaranzeliu	Mona bianca	Arriadolza ruia	Martellata
Appesorgia	Moscato	Bovalleddu	Monica
Arvesionadu	Nasco	Burrette	Murinu
Argumannu	Nuragus	Caddiu	Nieddera
Axina de tres bias	Pansale	Cagnulari	Nieddu addosu
Baraidu	Pranta	Cannonau	Nieddu mannu
Bianca settima	Redagliadu	Carenisca	Nieddu proccu
Bianca antiga	Semidano	Caricajola	Paddiu
Calabresa	Sinnidano	Carignano	Pascale di Ca.
Coghighitto	Regulesa	Gravellu	Regina ruia
Girò biancu	Taloppo	Girò	Taloppu nieddu
Guamazza	Torbato	Girone di Spagna	Tzaccarradore
Lacconargiu	Vernaccia	Gregu nieddu	Ua rosa
Littacchina		Lacconargiu ruiu	Verturi
Malaga bianca		Malaga	

Tav. 2. Percentage of viral species, obtained with immune-enzymatic tests, on local grapevine cultivars.

Vines	No. Plants sampled	“Fanleaf”	“Leafroll”				“Rugose wood complex”		“Fleck”
		GFLV	GLRaV-1	GLRaV-2	GLRaV-3	GLRaV-7	GVA	RSP*	GFkV
		%	%	%	%	%	%	%	%
Arvesionadu	50	0	26	48	10	0	8	87	35
Bovalleddu	50	6	34	60	18	0	32	100	24
<b>Carenisca</b>	50	0	0	0	26	0	2	n.t.	2
Caricajola	50	0	26	38	10	0	4	95	36
Girò	60	22	13	28	38	0	73	n.t.	53
Gregu n.	60	5	82	30	93	0	88	n.t.	73
Moscato	250	5	24	74	28	0	59	100	41
Nasco	80	0	84	n.t.	75	0	90	100	74
Nieddera	50	0	36	24	54	0	8	80	70
<b>Redagliadu</b>	50	0	0	22	0	0	0	70	4
Semidano	450	3	4	36	44	0	72	82	32

\*) Results for the biological tests on the indicator *V. rupestris*; n.t. = not tested

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