

Javier Portu\*, Elisa Baroja, Juana Martínez, Luis Rivacoba, Enrique García-Escudero

Instituto de Ciencias de la Vid y del Vino (Gobierno de La Rioja, CSIC, Universidad de La Rioja). Ctra. Burgos, Km. 6. Finca La Grajera. 26007 Logroño, La Rioja (Spain)

\*jportur@larioja.org; javier.portu@icvv.es

## INTRODUCTION

- Cultivation of a few number of clones is causing the loss of vineyard biodiversity, resulting in the disappearance of biotypes.
- This topic is so relevant that OIV made a recent resolution to the recovery and conservation of intra-varietal diversity [1].
- Regional Government of La Rioja established a germplasm bank with more than 1.600 accessions, which origin lies in the prospecting and sampling of ancient vineyards located throughout the whole region. 30 clones cv. Tempranillo and 13 cv. Graciano were preselected and multiplied in a new vineyard for further observations.
- The aim of this work is to describe the first results obtained from the agronomic characterization of these biotypes, which constitute the base of a new clonal selection that aims to increase the range of available certified clones.

## METHODOLOGY

- Candidate clones (30 cv. Tempranillo and 3 commercial references; 13 cv. Graciano and 2 commercial references) were planted in 2016 in La Rioja (Spain) in a complete randomized block design with four blocks of 10 plants.
- In 2020 clones were evaluated according to yield parameters, phenological data, must composition and vegetative growth parameters.
- In addition, clones were vinified and wine physical-chemical parameters, total phenolic index (TPI), anthocyanin content (mg/l) and color intensity were determined.

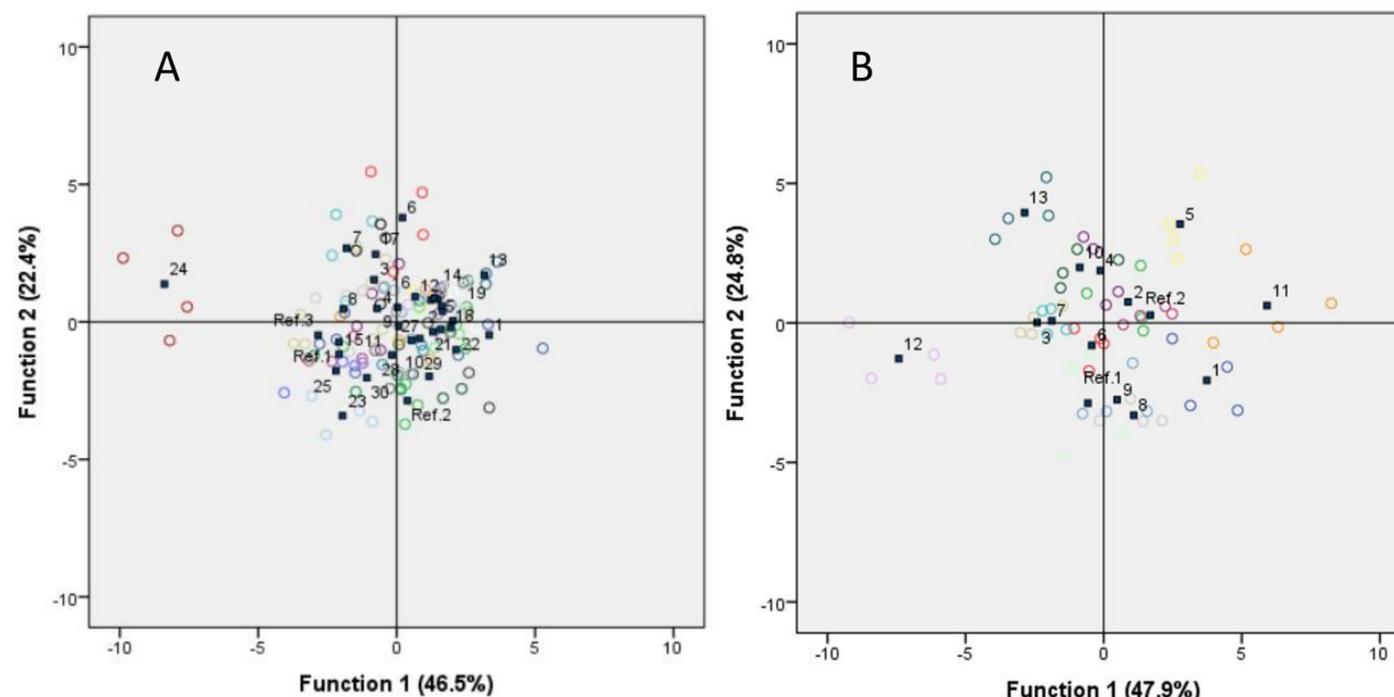


Figure 1. Classification by canonical discriminant analyses of Tempranillo (A) and Graciano (B) clones on the basis of their agronomic behavior and must physical-chemical composition.

Table 1. Range of variability in phenological dates of 30 biotypes cv. Tempranillo and 13 cv. Graciano.

	Tempranillo	Graciano
Budburst	4th April (31st March-8th April)	8th April (4th April-15th April)
Flowering	30th May (29th May-1st June)	31st May (31st May-1st June)
Veraison	2nd August (29th July-5th August)	16th August (15th August-20th April)
Harvest	15th September (7th September-29th September)	2nd October (22nd September-8th October)
Cycle length (d)	164 (154 – 182)	177 (167 – 187)

## REFERENCES

- OIV (2019). Resolution VITI 564B-2019, OIV process for the recovery and conservation of the intravarietal diversity and the polyclonal selection of the vine in grape varieties with wide genetic variability. International Organization of Vine and Wine, Paris, France.

## RESULTS

- Significant differences between clones were found for each parameter (data not shown).
- Results of canonical discriminant analyses provided two canonical functions that explained around 70% of accumulated variance in both varieties.
- Variables contributing most to clone classification in Tempranillo were: weight of 100 berries, °Brix and malic acid (function 1); tartaric acid, potassium and bunch compactness (function 2).
- In Graciano, the most important variables were pH, °Brix and potassium (function 1); pH, total acidity and potassium (function 2).
- Biotypes also showed great diversity regarding phenological cycle (Table 1) and wine composition (Table 2).

Table 2. Range of variability of the oenological parameters of wines made from 30 preselected biotypes cv. Tempranillo and 13 cv. Graciano.

	Tempranillo	Graciano
Alcohol (% v/v)	14.2 (12.8-15.5)	13.2 (12.2-14.1)
pH	4.02 (3.86-4.30)	3.40 (3.25-3.53)
Total acidity (g/l)	4.63(3.80-5.30)	6.94 (5.70-8.10)
Tartaric acid (g/l)	1.25 (1.06-1.46)	2.34 (1.76-3.47)
Lactic acid (g/l)	2.19 (1.77-2.96)	1.11 (0.80-1.39)
Potassium (mg/l)	1576 (1220-2360)	811 (646-1020)
Hue	0.70 (0.59-0.84)	0.45 (0.41-0.48)
Color intensity	6.67 (3.98-8.38)	13.5 (8.85-17.4)
Total phenolic index	48.8 (38.4-59.6)	43.8 (34.7-54.4)
Total anthocyanins (mg/l)	465 (319-600)	469 (381-593)

## CONCLUSIONS

- Clones have shown big differences in many of the parameters analyzed.
- Results confirmed therefore the huge wide genetic variability existing between biotypes.
- Intra-varietal variability constitutes the best guarantee of adaptation of these cultivars to future objectives and environmental conditions.
- Clone evaluation will continue in order to fulfil their complete characterization.

## ACKNOWLEDGEMENTS

This study was co-funded (50/50) by the European Regional Development Fund (FEDER) and the Government of La Rioja, within the FEDER operational program of La Rioja 2014-2020.