



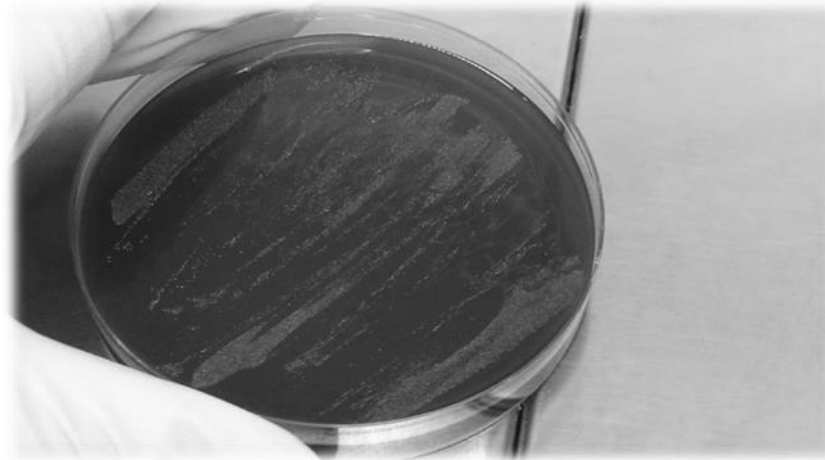
Genetic characterization of different *Vitis* species using SSR markers associated with the resistance gene PdR1.

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INTRODUCTION:

Xylella fastidiosa is a gram-negative bacterium that affects a wide variety of species, including grapevines, producing a symptomatology that leads to the decay of the plant and its eventual death, causing considerable economic losses. However, it has been observed that the *Vitis arizonica* species from America has a resistance related to the gene called PdR1, which is located on chromosome 14 and is flanked by a considerable number of SSR molecular markers. We therefore wish to observe the classification of the different varieties of *Vitis Vinifera* compared to the above-mentioned American species in relation to the SSRs linked to the resistance gene.



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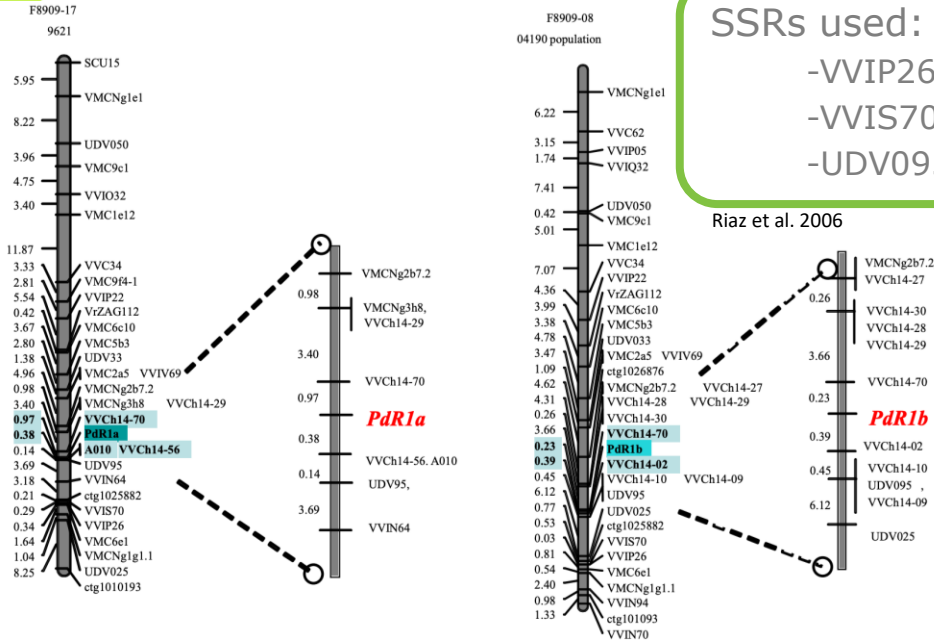
A total of 193 genotypes of 89 varieties have been selected, including different clones of the same variety, as well as wild, American and native varieties from the Basque Country for the production of txakoli.

SSRs used:

-VVIP26	- VVIN64
-VVIS70	- VMC6e1
-UDV095	- VMC2a5

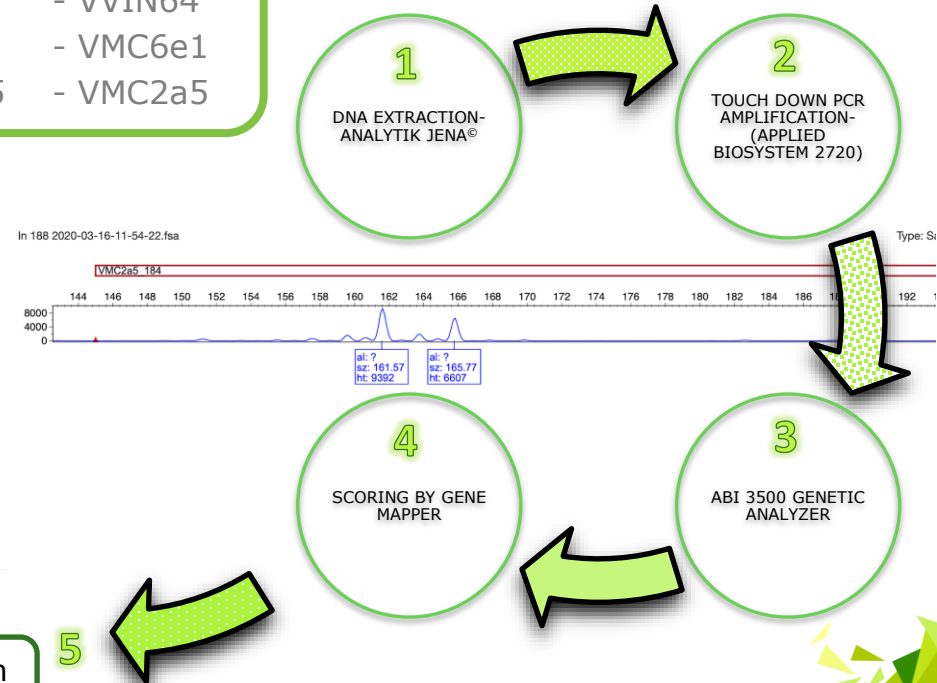
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- | | |
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Riaz et al. 2006



WALKER, A., et al. 2017 *European Conference on Xylella fastidiosa*.

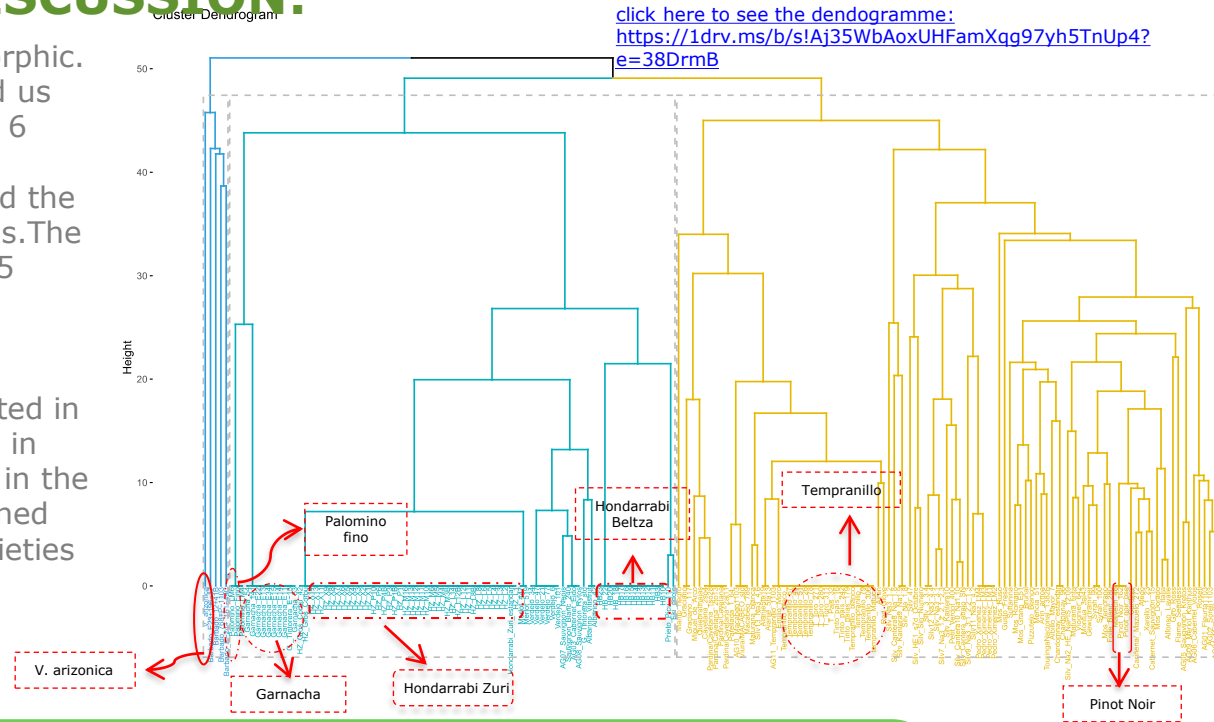
Hierarchical clustering calculation and graphical representation was carried out using *factoextra* R package.



RESULTS AND DISCUSSION:

The SSR markers used are quite polymorphic. Scoring with gene mapper has provided us with 96 different alleles in the set of the 6 molecular markers, being the most polymorphic **VVIP 26** with 24 alleles and the least polymorphic **VVIN 64** with 9 alleles. The average amplification of the SSRs is 17.5 alleles per marker.

These molecular markers have been tested in European varieties as they were verified in American varieties before and similarity in the allelic pattern has been found. We obtained the same pattern in commonly used varieties in previous studies (Riaz et al. 2018)



- The American varieties used as rootstocks are the closest to *Vitis arizonica*, parent of *V. arizonica* b43-17, which has the aforementioned PdR1 gene.
- The first markers evaluated with these European varieties showed us the Palomino fino, Garnacha and Hondarrabi Zuri varieties closest to the American group. Meanwhile, commonly used Tempranillo and Pinot Noir are far from the tolerant genotypes.

CONCLUSIONS:

1. SSR markers can be interesting as a first approximation, although it would be interesting to use other markers linked to the gene sequence itself, such as SNPs.
2. Varieties closer to the American varieties could be useful for the creation of hybrids with their own fruit characteristics and the resistant capacity of the cross.
3. On their own, no *Vitis vinifera* is known to be resistant to the disease.
4. Txakolitera varieties have more in common with the resistant variety than other varieties such as Tempranillo (the main variety in Spain), which could be of interest for a more exhaustive evaluation.

Bibliographical references:

1. WALKER, A., et al. Controlling Pierce's disease with molecular and classical breeding. En *European Conference on Xylella fastidiosa: finding answers to a global problem, Palma de Mallorca*. 2017. p. 13-15.
2. RIAZ, S., et al. Genetic characterization of *Vitis* germplasm collected from the southwestern US and Mexico to expedite Pierce's disease-resistance breeding. *Theoretical and Applied Genetics*, 2018, vol. 131, no 7, p. 1589-1602.