

# GRAPEVINE CULTIVAR ‘ALFROCHEIRO’ OR ‘BASTARDO NEGRO’ PLAYS A PRIMARY ROLE IN IBERIAN GRAPEVINE DIVERSITY

Jorge CUNHA<sup>1,2</sup>; L. Hasna ZINELABIDINE<sup>3</sup>; Margarida Teixeira-Santos<sup>1</sup>; João BRAZÃO<sup>1</sup>; Pedro FEVEREIRO<sup>2,4</sup>; José Miguel MARTINEZ-ZAPATER<sup>3</sup>; Javier IBÁÑEZ<sup>3</sup> and José E. EIRAS-DIAS<sup>1</sup>

<sup>1</sup> Instituto Nacional de Investigação Agrária e Veterinária, Portugal;

<sup>2</sup> Universidade Nova de Lisboa, Instituto de Tecnologia Química e Biológica (ITQB), Portugal;

<sup>3</sup> Instituto de Ciencias de la Vid y del Vino (CSIC, Universidad de La Rioja, Gobierno de La Rioja), Spain;

<sup>4</sup> Universidade de Lisboa, Faculdade de Ciências, Departamento de Biologia Vegetal, Portugal.

**INTRODUCTION** – The grapevine cultivar known in Portugal as ‘Alfrocheiro’, and in Spain as ‘Bastardo Negro’, ‘Bruñal’ or ‘Baboso Negro’, plays a central role in the genetic network of the Iberian Peninsula grapevine cultivars. ‘Alfrocheiro’ was already identified as a progenitor of several cultivars either by SSRs or by SNPs but until now its progenitors are unknown.

**AIMS AND SCOPES** – The present study aims to clarify the relationships of ‘Alfrocheiro’ as a progenitor of at least 20 offspring’s in the Iberian Peninsula, especially in Portugal.

**MATERIALS AND METHODS** – The pedigree analysis was done using 1117 SNPs profiles from the database of the ‘Instituto de Ciencias de la Vid y del Vino’ of Spain, including 200 profiles from Portuguese cultivars collected at the Portuguese National Ampelographic Collection (PRT051), to find the potential candidate parents. For each possible trio and duo the LOD score was calculated using the software CERVUS 3.0. Known pedigrees were used to empirically estimate the limit value of the LOD used to detect the presence of a parent. Chloroplast SSRs were used to clarify which of the possible parents was the maternal one. Twenty one nuclear SSRs were also used in trios of parents and offspring with “Logarithm of odds” (LOD) scores lower than 60 to further clarify the pedigrees.

**RESULTS AND DISCUSSIONS** – From the 332 SNPs scored, only 252 SNPs were informative to be used in establishing pedigrees. All genotypes involved in possible trios or duos (sharing at least one allele per locus) with Alfrocheiro were selected. A total of twenty full possible trios and four duos were found (trios previously identified are not named). Four new trios were identified with ‘Alfrocheiro’ and ‘Cayetana Blanca’ as parents of ‘Casculho’, ‘Castelã’, ‘Casteloa’, and ‘Jampal’. Three cultivars, ‘Allarén’, ‘Castelão Branco’ and ‘Trincadeira das Pratas’, were identified for the first time as offspring’s of ‘Alfrocheiro’ and ‘Hében’. Further five full trios were identified with Alfrocheiro and five other known cultivars as progenitors, ‘Airén’, ‘Amaral’, ‘Patorra’, ‘Ramisco’ and ‘Tinto Cão’, with the following offspring’s respectively, ‘Parreira Matias’, ‘Douradinha’, ‘Mencia’, ‘Concieira’ and ‘Malvarisco’. Although the LOD score value (54.9) obtained for ‘Alfrocheiro’ and ‘Ramisco’ as progenitors of ‘Concieira’. The genotyping with 21 SSRs supports this trio. From cpSSRs analyses no conclusion about the maternal line was possible since all the genotypes in the trios share haplotype A, the most common in the Western European gene pool.

**CONCLUSIONS AND POSSIBLE APPLICATIONS** – The use of SNPs markers in pedigree analysis is a reliable technique to identify trios and duos of relationships in a large database with samples coming from different origins. The use of a set of 252 SNPs revealed the key role played by the cultivar ‘Alfrocheiro’ in the origin of several important and also some minor cultivars of the Iberian Peninsula, with a special emphasis to cultivars important in Portuguese wine areas. Even though none of the progenitors of ‘Alfrocheiro’ was identified, four cultivars, ‘Branda’, ‘Monvedro’, ‘Tinta Pomar’ and ‘Savagnin’ or ‘Traminer’ could theoretically be one of them, since they all share with it one set of alleles. The nature of their relationships will remain unknown until further cultivars are characterized. ‘The distribution of ‘Alfrocheiro’ and its offspring, as well as of its two main co-parents (‘Cayetana Blanca’ and ‘Hében’), point to a geographic origin around the Portuguese and Spanish border. This cultivar and its progenies represent around 15% of the Portuguese vineyards, stressing its importance in the Portuguese wine character.