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Research Note

Redimeire: A natural mutation of cv. Italia in Brazil

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Summary: The occurrence of another natural mutation in cv. Italia is described, which is the main table grape variety cultivated in Brazil. The mutant cultivar from unknown origin is named Redimeire in its growing region. Its fruits are long-ovally shaped, with medium length/width ratio of 1.73, purple coloration and delicate muscatel taste.

Key words: *Vitis vinifera*, new variety, genetics, RAPD.

Introduction: Mutations are the base for genetic selection in a plant population. In general, they are accidents that happen in a fortuitous and unpredictable manner, with very low frequency, at rates of 10^{-6} - 10^{-8} . Spontaneous mutations, on the other hand, are more frequent if temperature is high, like in tropical countries.

In 1927 cv. Italia was introduced into Brazil, the Ferraz de Vasconcelos County, São Paulo State, by the agronomist LUCIANO POLETTI; it became the most important table grape variety in Brazil. After its introduction some economic important mutations of Italia were selected such as Rubi (1974) with purple berries (KISHINO and MASHIMA 1980); Benitaka (1988) with dark reddish berries; and Brasil (1995) with purple dark fruits, a mutation of Benitaka. The nuclear DNA polymorphism through RAPD molecular markers is a simple and inexpensive method for germplasm characterization, which has been used in several studies with grapevines (SAWAZAKI *et al.* 1966; THIS *et al.* 1997). In the present paper it was used to verify the genetic similarity between Italia and Redimeire grapevines. This study describes the main phenotypic and biochemical characteristics of Redimeire, a mutant of Italia.

Material and Methods: The retromutation occurred in a vineyard with Redimeire, in the Urânia County, São Paulo State, Brazil, (20°16' S and 50°24' W, 418 m a.s.l.) when at the same shoot we found one cluster of Redimeire, and one cluster of Italia. Leaves, shoots and fruits of Redimeire and Italia were collected for ampelographic and biochemical analyses; cv. Redglobe was used as an indicator of differentiation between cultivars. Ampelographic and ampelometric diagnostics were conducted as proposed by GALET (1993). To characterize length, width, weight and number of seeds,

10 clusters and 15 berries of each cluster of cvs Italia (I) and Redimeire (R) were sampled. For molecular diagnostic, genomic DNA was extracted from a mixture of young leaves, using the Nucleon Phytopure kit of Amersham. Kits of primers OPA, OPB, OPC, OPD, OPE, OPF and OPG from OPERON Technologies were used.

Results and Discussion: Observations of leaves, shoots and laterals from cvs Italia and Redimeire showed that both cvs have the same ampelographic and ampelometric characteristics. The major difference between Italia and Redimeire was found in the fruit. Italia has very large, compact, and conic-cylindrical-shaped clusters. The berries are elliptic, very large, with a medium size of 28 x 22 mm, yellow-amber coloured, with a fleshy and crispy pulp and a slight muscatel taste (GALET 1993). On the other hand, Redimeire has somewhat loose clusters, with a conic-cylindrical shape. The berries are long-oval-shaped, have medium weight, a medium length/width relation of 1.78, a fleshy and crispy pulp, purple coloration and a delicate muscatel taste (Fig. 1). On average, the length of 100 berries of Italia was 31.3 mm, the width 25.5 mm; the mean weight was 11.9 g and number of seeds 2.2. Figures for Redimeire were, respectively, 34.2 mm, 19.2 mm, 7.89 g and 1.64 seeds. The coefficient of variation for the characteristics *supra*, was always higher for Redimeire.

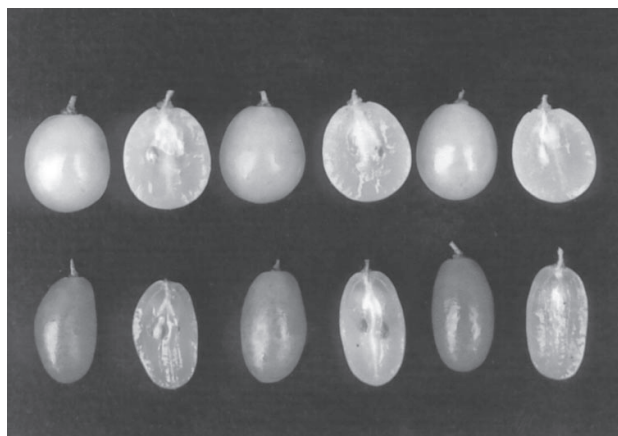


Fig. 1: Berries of cvs Italia (above) and Redimeire (below).

Estimation of the genetic similarity based on the number of common DNA fragments, using the primers OPA, OPB, OPC, OPD, OPE, OPF and OPG indicated no difference between Italia and Redimeire. On the other hand, differences were observed in relation to Redglobe with the primers OPA7, OPA8, APA11, OPA14, OPA15, OP16, OP17, OP19, OPB2, OPB13, OPC1, OPC2, OPC3, OPC4, OPC5, OPC6, OPC7, OPC8, OPD10, OPD11, OPD12, OPD13, OPD14, OPD15, OPD18, OPE1, OPE2, OPE3, OPE4, OPE5, OPE6, OPE8, OPE10, OPE16, OPE18, OPE19, OPG1, OPG5, OPG6. Fig. 2 shows that Redglobe had different bands as compared to Italia and Redimeire with the primers OPA7, OPA8, OPA15, OPB2, OP14 and OPD15.

Conclusions: From ampelographic and ampelometric studies of leaves, shoots and laterals concluded that Redimeire and Italia are phenotypically identical cultivars.

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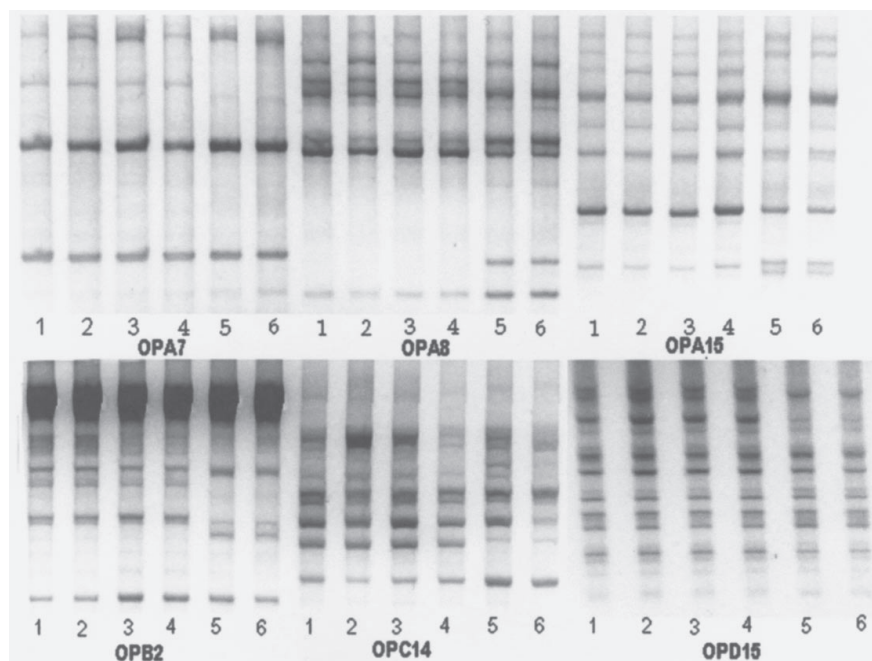


Fig. 2: RAPD profile from cvs Italia (1,2), Redimeire (3,4) and Redglobe (5,6) using primers OPA7, OPA8, OPA15, OPB2, OPC14 and OPD15.

From RAPD analysis it was concluded that Redimeire and Italia have the same genetic composition. Due to relevant morphological grape characters the two cultivars are different. There were significant statistical differences for morphological berry characteristics, the distribution of the berries characteristic being normal except for Redimeire berry width for which kurtosis had a very high value (30.16) far from normal distribution.

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