

Aromatic Characterisation of Malvasia Odorosissima Grapevines and Comparison with Malvasia di Candia Aromatica

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Malvasia odorosissima is an aromatic grapevine (*Vitis vinifera* L., 1753) variety that is often confused with Malvasia di Candia aromatica (*Vitis vinifera* L., 1753), despite the genetic information now available on the pedigree and genetic relationships linking the two varieties. In an effort to offer a contribution to fill this gap, also from an aromatic point of view, free and glycosylated aroma compounds were determined using the SPE extraction method, followed by GC-MS analysis in two consecutive vintages. The results have for the first time provided the aromatic characterisation of Malvasia odorosissima. Geraniol and its derivatives were the most abundant set of volatiles. In contrast to Malvasia di Candia aromatica and the other aromatic varieties, Malvasia odorosissima showed a very small amount of glycosylated volatiles, thus expressing its aromatic potential almost completely. The abundance of free terpenoids in the aromatic profile of Malvasia odorosissima, even higher than in Malvasia di Candia aromatica, is a main feature for the oenological exploitation of this variety, which is on the brink of extinction. In addition, the presence of rose oxides, found solely in Malvasia odorosissima, renders its aromatic profile more similar to that of White Muscat. This result is consistent with the parent-offspring relationship linking the two varieties that was recently ascertained.

INTRODUCTION

Grape aroma compounds are considered quality indexes that influence the wine's sensory expression (Lund & Bohlmann, 2006). Terpenoids, C₁₃-norisoprenoids, benzenoids, aliphatic alcohols (in short aliphatics), esters, methoxypyrazines and sulphur-containing compounds are the main classes of volatiles identified in grapes (Robinson *et al.*, 2014). Several of these compounds are present in grapes in their free and glycosylated forms, and their relative proportion varies according to the cultivar (González-Barreiro *et al.*, 2015). Glycosides are considered an aromatic potential, since they are susceptible to releasing volatile aglycones through enzymatic or acid hydrolysis (Loscos *et al.*, 2009).

It has long been known that terpene compounds contribute mainly to the varietal aromatic profile (Stevens *et al.*, 1966; Webb *et al.*, 1966; Ribéreau-Gayon *et al.*, 1975; Gunata *et al.*, 1985). In fact, aromatic and non-aromatic grapevine varieties can be distinguished on the basis of their total concentration of free monoterpenes (Mateo & Jiménez,

2000). A different classification of the aromatic varieties can be carried out according to the prevalence of either linalool and its derivatives or geraniol and its derivatives (Di Stefano, 2013).

Malvasia di Candia aromatica (MC) and Malvasia odorosissima (MO; also known as Malvasia aromatica di Parma) are white aromatic varieties belonging to the Malvasia family, a large group of cultivars commonly considered to be born in Greece and widely cultivated in the Mediterranean area (Crespan *et al.*, 2006), as well as North America (Bettiga *et al.*, 2003), South America (Fielden, 2003; Ducati *et al.*, 2009) and Australia.

One of the most interesting aspects of many Malvasia varieties is the expression of aromatic compounds. Just like the Moscato family, Malvasia varieties are used worldwide in winemaking due to their peculiar sensory characteristics. In particular, these kinds of wines are in great demand in the Asian and Eastern markets, where grapevine nurseries and grapevine growing are developing strongly.

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