

ORIGINAL PAPER

Comparison of anthocyanins present in grapes of *Vitis vinifera* L. varieties and interspecific hybrids grown in the Czech Republic^aJosef Balík, ^bMichal Kumšta, ^cOtakar Rop*^aDepartment of Post-Harvest Technology of Horticultural Products, ^bDepartment of Viticulture and Oenology, Faculty of Horticulture, Mendel University in Brno, Valtická 337, 691 44 Lednice, Czech Republic^cDepartment of Food Technology and Microbiology, Faculty of Technology, Tomas Bata University in Zlín, Náměstí TGM 275, 762 72 Zlín, Czech Republic[†]

Received 27 August 2012; Revised 10 January 2013; Accepted 15 January 2013

Anthocyanins present in the grapes of nine grapevine (*Vitis vinifera* L.) varieties and ten interspecific hybrids were compared. Total anthocyanin levels were determined in fresh grapes and the values ranged from 0.50 g kg⁻¹ to 4.99 g kg⁻¹. A total of twenty-two different anthocyanins were identified. Malvidin 3-glucoside was the most abundant anthocyanin, with concentrations ranging from 30 % to 64 % of the totals observed. The ratio of acetylated to coumaroylated malvidin and peonidin derivatives ranged from 0.09 (variety: Regent) to 1.34 (variety: Cerason), depending on the variety. Diglycosylated anthocyanins were not found in particular interspecific hybrids such as the teinturier XIV 26-56, Laurot, Merlan, and Nativa.

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Keywords: grape, *Vitis vinifera* L., interspecific hybrids, teinturier, anthocyanins**Introduction**

Anthocyanins are the most common group of water-soluble plant pigments. Due to the fact that their molecules contain a carbon skeleton of C6—C3—C6, they are classified among naturally-occurring phenols as flavonoids (Timberlake, 1980). Basically, they are heteroglycosides consisting of a saccharide component and an aglycon (anthocyanidin). In grapes of *V. vinifera* L. there are five coloured aglycons commonly occurring, namely cyanidin, peonidin, delphinidin, petunidin, and malvidin (Mazza & Francis, 1995). Another aglycon, pelargonidin, has been reported by Zhao et al. (2010) in grapes of *V. amurensis* and its hybrids.

Anthocyanin molecules are always glycosylated either in the C-3-*O* position (monoglycosides) or additionally in the C-5-*O* position (diglycosides), and to

date only glucose and one unidentified pentose have been found in the anthocyanins which occur in grapes (Mazzuca et al., 2005).

The saccharide component of an anthocyanin is often acylated with some organic acids. In grapes, the anthocyanins are most frequently acylated with *p*-coumaric and acetic acids, but also occasionally with caffeic, pyruvic, and ferulic acids (Revilla et al., 2001; He et al., 2010). García-Beneytez et al. (2003) also identified small amounts of the *cis*-isomers occurring alongside the predominant *trans*-isomers of anthocyanins acylated with *p*-coumaric acid. Alcalde-Eon et al. (2006) were the first to identify anthocyanins acylated with lactic acid in wine made from the variety Tempranillo.

In the course of ripening, anthocyanins accumulate in the berry skins (and, in the case of teinturier varieties, also in the pulp), and are responsible for

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