Title Cultivar, juice extraction, ultra violet irradiation and storage influence the stilbene content of muscadine grape (*Vitis rotundifolia* Michx.)

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Citation Thesis, Doctor of Philosophy (Horticulture). Louisiana State University and Agricultural & Mechanical College120 pages. 2006

Keywords *Vitis rotundifolia*; UV; Juice, Storage; Stilbene; Muscadine grape

Abstract

Stilbene concentration was analyzed in juice and tissue of muscadine grape (*Vitis rotundifolia* Michx.) and bunch grape (*Vitis labrusca* L.) from fresh fruit, after processing and after postharvest treatments. Five filter types were evaluated for percent resveratrol recovery when filtering standard and spiked juice samples in preparation for HPLC analysis. Only two (polycarbonate and Anopore) of the five filter types had more than 90 percent recovery. Polycarbonate was chosen for sample preparation since it was more durable during handling. Eight muscadine grape cultivars and three bunch grape cultivars were evaluated. Skin tissue had approximately 100 times higher stilbene concentration than did the pulp for all cultivars studied. 'Carlos' and 'Magnolia' muscadine cultivars had the greatest skin stilbene concentration of all the muscadine cultivars evaluated. Except for 'Sweet Jenny', bronze cultivars had greater skin stilbene concentration than black skinned cultivars. 'Miss Blanc' *Vitis labrusca* grape had greater skin stilbene concentration than all other cultivars. Stilbene concentration of fresh juice extracted from 'Noble' and 'Carlos' muscadine grapes was relatively low compared to processed juices. Juices obtained using hot press and freezing methods of juices extraction had significantly higher stilbene concentration than free run or cold pressed juice. Although 'Carlos' skin tissue had significantly more stilbenes than 'Noble' skins, there were no significant differences between free run, cold press or hot press juices obtained from the two cultivars. Although pectic enzyme treatment significantly increased juice yields, stilbene concentrations were not significantly higher than other juice extraction methods. In contrast to 'Carlos' muscadine grape, where high skin stilbene concentration did not result in high juice concentration, *Vitis labrusca* grape juices had relatively high stilbene concentration when compared to muscadine juices. UV irradiation and cold storage had a significant effect on stilbene concentration of muscadine grape tissue. For 'Carlos' muscadine grape, cold storage alone doubled skin stilbene concentration, but UV irradiation did not significantly change stilbene levels. In contrast, in 'Noble' muscadine grape, UV irradiation increased skin stilbene concentration by 50%, but cold storage alone had no effect.