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Polyphenol variations in fruit development of *Eugenia uniflora* varieties

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Eugenia uniflora L., Myrtaceae, is a Brazilian medicinal species known as pitangueira. The epicarp of its fruits, according to variety, evolves from green to different colors in mature stage (red, orange or purple). This study aimed to identify tannins in the fruit and quantify phenolic changes during fruit development. Anthocyanins, flavonoids, tannins and total phenolics were analyzed in three fruit varieties at four developmental stages by colorimetric assays. HPLC/DAD analysis used tannins standards.¹ Oenothin B, an ellagitannin with antitumor activity, was the major compound identified, besides four other tannins. Redundancy analysis (RDA) assessed the way developmental stages influences fruit's chemical constituents. Both cumulative variance in the first factorial plane (70.9%), Figure 1, and correlation between chemicals and stages/varieties for the first canonical axis (0.9623) were higher. RDA1 described an ordering of samples according to fruit maturity; anthocyanins with high positive loadings represented the final stage (E4); flavonoids and tannins were characteristic of the green stage (E1). RDA2 showed a clear separation between pitanga's varieties (red/purple and orange). Thus, according to cluster analysis, two main sample classes were obtained. Contents of total phenols and oenothin B did not changed during fruit maturation and between varieties (29.0 and 32.4 mg/g, respectively). Principal response curves (PRC) technique was performed to analyze differences in phenolic contents along to development stages of pitanga's varieties. PRC results showed that 85.6% of total variance was explained by interaction between varieties and degree of ripeness, whose 50.4% can be attributed to variety effect. Anthocyanins, eugeniflorin D2, tellimagrandin II and monogalloylglucose were mainly responsible for purple/orange divergences compared to red pitanga, used as control (Figure 2). Multivariate analysis confirmed the chemical variation not only among the varieties of pitanga but also during the fruit development stages, thus showing that potential medicinal uses may differ between the varieties and the degree of fruit maturation.

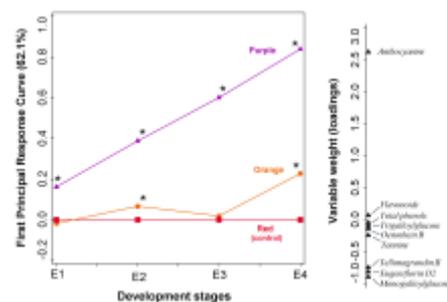
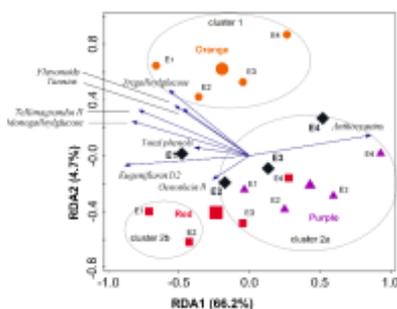


Figure 1. RDA ordination of the first two axes. **Figure 2.** Principal Response Curves (PRC1).

Keywords: hydrolysable tannins, fruit development, multivariate analysis.



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Reference

- ¹Fortes, G.A.C., Carvalho, A.G., Ramalho, R.R.F., Silva, A.J.R., Ferri, P.H., Santos, S.C., 2015. Antioxidant activities of hydrolysable tannins and flavonoid glycosides isolated from *Eugenia uniflora* L. *Rec. Nat. Prod.* 9, 251-256.