The maturity degree, phenolic compounds and antioxidant activity of Eureka lemon [*Citrus limon* (L.) Burm. f.]: A negative correlation between total phenolic content, antioxidant capacity and soluble solid content

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Abstract

Lemon fruits are well-known for their economic, nutrition and health values. In this study, the maturity degree, phenolic compounds and antioxidant capacity of Eureka lemon [*Citrus limon* (L.) Burm. f.] fruits harvested at different months of the year were investigated. We found that the fruits harvested in November outperformed others in terms of weight, total sugar and soluble solid content (SSC). The *ρ*-coumaric acid, ferulic acid, eriocitrin and hesperidin were the predominant phenolic compounds in lemon fruits. The highest total phenolic content (TPC, 3.49 ± 0.05 mg GAE g^{-1} FW), total flavonoid content (TFC, 1.46 ± 0.05 mg RE g^{-1} FW), sum of individual phenolic acids content (269.36 μg g^{-1} FW) and their antioxidant potency composite (APC) index (100.00%) were found in the pulps of April fruits. The maximum of sum of individual flavonoids content (3098.42 μg g^{-1} FW) exhibited in August. For the peels, the highest TFC (6.35 ± 0.24 mg RE g^{-1} FW) and APC (95.14%) appeared in April fruits, while the highest TPC (7.96 ± 0.17 mg GAE g^{-1} FW) and sum of individual flavonoids content (9003.91 μg g^{-1} FW) occurred in the August. However, the maximum of sum of individual phenolic acids content (769.28 μg g^{-1} FW) was detected in June fruits. We also found that soluble solid content (SSC) of the pulps of lemon fruits were negatively correlated with their TPC and APC. TPC also decreased with the increase in SSC of peels. Most importantly, our study indicated that the contents of phenolic compounds and antioxidant activity of lemon fruits varied significantly with their maturity degrees depending on different harvest time, and this information is essential for a better use of different lemons fruits resources.