

Maturity effect on the antioxidant activity of leaves and fruits of *Rhodomyrtus tomentosa* (Aiton.) Hassk.

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Abstract: *Rhodomyrtus tomentosa* has been used as a traditional medicine for a long time in Southeast Asia countries and also in Indonesia. It is believed that the phytochemical content of its fruit at different levels of ripeness may affect its antioxidant activity. Therefore, this study aims to determine the antioxidant activity, phenols and flavonoids contents, and their distribution in the leaves and fruits of *R. tomentosa* at different levels of maturity. The antioxidant activity was determined using DPPH and FRAP analysis. Furthermore, the total flavonoid and phenolic contents were analyzed using the colorimetric and Folin–Ciocalteu methods. The distribution of secondary metabolites in the leaves or fruits tissues was determined using histochemical analysis. Antioxidant capacity was analyzed using DPPH and FRAP, and a comparable result was obtained. The highest antioxidant activity was observed in the green fruit with the value of 1419.75 ± 3.48 and 1367.59 ± 9.12 $\mu\text{mol TE/g DW}$ for DPPH and FRAP, respectively. The highest TFC value observed in the young leaves and green fruits of the ethanol extract was 96.375 ± 3.96 and 95.731 ± 5.42 mg QE/g DW , respectively. The highest TPC was found in the red fruits 50.772 ± 7.46 mg AGE/g DW . The histochemical analysis provided a clear distribution of flavonoid and phenolic within the leaves and fruits. It was found that both compounds accumulated in the epidermis, mesophyll, vascular bundles, secretory cavity, and parenchyma midrib of the leaves, and also in the exocarp and mesocarp endocarp, secretory cavity, vascular bundles, seed, trichomes of the fruits. This study showed that young leaves and green fruits have a higher potency of being a natural source of antioxidants and flavonoid compounds.

Keywords: antioxidant; flavonoid contents; histochemical analysis; rose myrtle