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Antioxidant activity and physicochemical properties of *Flacourtia indica* (Uguressa) at different maturity stages

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Flacourtia indica is an underutilized fruit, which grows wild in bush and its fruits are generally consumed fresh at fully matured and ripe stages. Physicochemical, antioxidant and sensory properties of fruits shows a significant different between each maturity stage. The aim of this study was to analyze the physicochemical and antioxidant properties of fruits at different maturity stages and to identify the best maturity stage for harvesting. Fruits were collected from Galle, Sri Lanka and three maturity stages were selected according to the progressive colour change during fruit development, such as immature – fully green in colour, mature - purple and green in colour and ripen – dark purple in colour. Fruits at each maturity stage were randomly divided into two subgroups for antioxidant analysis and physiochemical testing. Antioxidant analysis was performed on freeze dried fruit samples. Results revealed that weight, volume, length, width, total soluble solids and moisture content of fruits were increased while decreasing pH significantly ($P < 0.05$) with the maturation and ripening of the fruit. Color of the fruits in terms of lightness (L^*) and yellowness (b^*) decreased significantly ($P < 0.05$) while increasing the redness (a^*) with maturity. According to antioxidant activity analysis, total phenol content (TPC) value (3.731 ± 0.20 mg gallic acid equivalents/g of dry powder) by Folin-Ciocalteu method showed no significant difference between immature and ripen stages but showed a slight increment in mature stage. 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity, ferric reducing antioxidant power (FRAP) and Oxygen radical absorbance capacity (ORAC) values increased with the maturation and ripening of *Flacourtia indica* fruit. The study also revealed that dark purple (fully ripen) fruits contained significantly high amount of antioxidant activity in terms of, DPPH, FRAP, ORAC values which were 2280.701 ± 53.05 ppm, 141.775 ± 2.04 mg trolox equivalents/g of dry powder, 31.376 ± 1.35 mg trolox equivalents /g of dry powder respectively. Based on results it can be concluded that fully ripening stage was the best maturity stage for harvesting and can be used as a natural antioxidant in food industry.

Keywords: *Flacourtia indica*, Maturity stages, Antioxidant activity, Physicochemical properties

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