Evaluation of Muntingia calabura Linn. as a Natural Antidiabetic and Antioxidant

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Muntingia calabura Linn (Tingiaceae), locally known as Aratiles or Jamaican cherry in its native neotropics, is widely distributed in the Philippines. Despite the various claims about its pharmacological properties, there has been limited reports about the chemical profile and biological activities of M. calabura from the Philippines. Therefore, this study investigated the antioxidant activity, antihyperglycemic properties, and chemical constituents of M. calabura plant parts, including root, bark, stem, leaves, fruits, and flowers. Results showed that total polyphenols and flavonoids were highest in the leaves, while total anthocyanidins, were mostly found in the roots. The antioxidant activity study, using the DPPH free radical scavenging activity assay, revealed that 2g of the different parts led to 90 – 94% inhibition as compared to Trolox. FRAP antioxidant capacity assay, also demonstrated high antioxidant power in the M. calabura leaf extract as compared to Trolox, a vitamin E analogue. Antihyperglycemic activities were noted to be concentration dependent, giving IC50 values of 35.61 ppm for α-amylase and 34.90 ppm for α-glucosidase which was comparable to Acarbose (16.32 ppm – 25.36 ppm). This study demonstrated that all tested plant parts of M. calabura Linn. are rich in phytochemicals with potent antioxidant activity and has the ability to suppress postprandial hyperglycemia. M. calabura can be relevant as a functional food, phytomedicine, nutraceutical, and health supplement source. Further studies may show the plant's utility in treating diabetes and its associated complications. Keywords: α-amylase, α-glucosidase, diabetes, functional food, Muntingia calabura, nutraceuticals, phytochemicals, phytomedicine