In vitro antioxidant properties of leaves from Sri Lanka-grown *Moringa oleifera* Lam morphotypes

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Moringa oleifera (Moringaceae), locally named 'Murunga', is tree with medicinal and nutritional value in its leaves. The objective of this study is to determine and compare antioxidant activity of M. oleifera leaf extracts from three morphotypes in Sri Lanka namely Miti murunga (MM), Wild murunga (WM) and Jaffna morphotype (JM). Air-dried and powdered mature leaves of M. oleifera were extracted with ethanol via cold extraction technique. Antioxidant activity was evaluated using DPPH free radical scavenging, ABTS free radical scavenging, Ferric Reducing Antioxidant Power (FRAP), Oxygen Radical Absorbance Capacity (ORAC) and Ferrous Ion Chelating (FIC) assays and determined Total Phenolic Content (TPC) and Total Flavonoid Content (TFC). The ethanol extract of JM exhibited a significantly high ABTS free radical scavenging activity (IC50-20.33 ± 1.03 µg/mL) over that of MM (IC50-47.25 ± 0.50 µg/mL) and WM (IC50-32.17 ± 1.84 µg/ml). Jaffna morphotype showed a significantly high DPPH free radical scavenging activity (IC50-160.67 ± 3.20 µg/mL) in comparison to that of MM (IC50-225.33 ± 4.27 µg/mL), WM (IC50-309.17 ± 6.01 µg/ml) and Trolox (IC50-9.3 ± 0.25 µg/ml). Both leaf samples of JM and WM showed significantly higher FRAP (95.00 ± 3.10 mg TE/g and 94.83 ± 4.02 mg TE/g, respectively) than that of MM (81.33 ± 5.28 mg TE/g). Leaf extracts of MM, WM and JM showed low FIC activity (21.60 ± 3.50%, 20.33 ± 1.16% and 25.83 ± 1.17% at 1000 µg/mL, respectively). In ORAC, MM showed the highest activity (13.40 ± 1.34 mg TE/g) followed by JM (9.81 ± 0.67 mg TE/g) and WM (6.66 ± 1.86 mg TE/g). Leaf extract of JM showed significantly higher TPC (86.80 ± 2.78 mg GAE/g) followed by WM (83.00 ± 1.41 mg GAE/g) and MM (40.00 ± 1.10 mg GAE/g). Total flavonoid content of both JM and MM showed significantly higher values (41.50 ± 1.76 mg Q/g and 43.67 ± 1.03 mg Q/g, respectively) in comparison to that of WM (32.00 ± 2.10 mg Q/g). The highest ABTS and DPPH free radical scavenging activity of leaf extract of JM may be attributed to its high TPC and TFC. The present study reveals for the first time, that the higher antioxidant activity of the leaf extract of the JM in comparison to that of MM and WM suggests its potential to be in Moringa based value added products with antioxidant properties.

Keywords: *Moringa oleifera*, leaves, antioxidant activity