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## List of Abbreviations

<b>Mean</b>	<b>Abbreviations</b>
2,2-azino-bis (3-ethylbenzothiazoline-6-sulfonate)	<b>ABTS</b>
2,2-Diphenyl-1-picryl hydrazyl	<b>DPPH</b>
adenosine triphosphate	<b>ATP</b>
Amplified fragment length polymorphism	<b>AFLP</b>
Analysis of Molecular Variance	<b>AMOVA</b>
Analysis of variance	<b>ANOVA</b>
Before Christ	<b>BC</b>
Calcium	<b>Ca</b>
Centimeter	<b>Cm</b>
Central nervous system	<b>CNS</b>
Cluster analysis	<b>CA</b>
Copper	<b>Cu</b>
decimetres	<b>dm</b>
Deoxyribonucleic acid	<b>DNA</b>
Dry weight	<b>DW</b>
Dry Weight	<b>DW</b>
Ethylenediaminetetraacetic acid	<b>EDTA</b>
Feet	<b>ft</b>
Ferric reducing antioxidant power	<b>FRAP</b>
Food and Agriculture Organization	<b>FAO</b>
Fresh weight	<b>FW</b>
Gallic acid equivalent	<b>GAE</b>
Gas Chromatography-Mass Spectrometry	<b>GC-MS</b>
Global Positioning System	<b>GPS</b>
Gram	<b>g</b>
High performance liquid chromatography	<b>HPLC</b>
Hour	<b>h</b>
<i>In vitro</i> gas production	<b>IVGP</b>
Inhibitory concentration	<b>IC50</b>
Inter simple sequence repeat	<b>ISSR</b>
International Fund for Agricultural Development	<b>IFAD</b>
Iron	<b>Fe</b>
kelvin	<b>K</b>
kilogram	<b>Kg</b>
Magnesium	<b>Mg</b>

*List of Abbreviations*

<b>Mean</b>	<b>Abbreviations</b>
Manganese	<b>Mn</b>
marker index	<b>MI</b>
mass spectrometry	<b>MS</b>
meter	<b>m</b>
Micro litter	<b>µl</b>
milliequivalent	<b>Meq.</b>
Milligram per gram dry weight	<b>mg/g DW</b>
Milligram per milliliter	<b>mg/ml</b>
Minimum inhibitory concentrations	<b>MICs</b>
Molecular weight	<b>MW.</b>
Multi drug resistance	<b>MDR</b>
Nitrogen	<b>N</b>
Numerical Taxonomy SYStem for personal computer	<b>NTSYS</b>
Part per million	<b>ppm</b>
Phosphorus	<b>P</b>
Polymerase chain reaction	<b>PCR</b>
Polymorphic fragment	<b>PF</b>
polymorphic information content	<b>PIC</b>
Potassium	<b>K</b>
power of hydrogen	<b>pH</b>
Principal component	<b>PC</b>
Principal Coordinates Analysis	<b>PCoA</b>
Proton Nuclear Magnetic Resonance Spectroscopy	<b>HNMR</b>
Quercetin equivalent	<b>QRE</b>
Random Amplified Polymorphic DNA technique	<b>RAPD</b>
Raw leaf flour	<b>RLF</b>
reducing power	<b>RP</b>
Round per minute	<b>rpm</b>
Selenium	<b>Se</b>
simple sequence repeat	<b>SSR</b>
Sodium dodethyl sulfate- polyacrilamide gel electrophoreses	<b>SDS-PAGE</b>
South West	<b>SW</b>
species	<b>Sp.</b>
Statistical package for the social science	<b>SPSS</b>
Thin-layer chromatography	<b>TLC</b>
Total amplified fragments	<b>TAF</b>

*List of Abbreviations*

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<b>Mean</b>	<b>Abbreviations</b>
Total Antioxidant Activity	<b>TAA</b>
total flavonoid contents	<b>TFC</b>
total phenolic contents	<b>TPC</b>
total antioxidant capacity	<b>TAC</b>
Tris EDTA solution	<b>TE</b>
Tris(hydroxymethyl)aminomethane	<b>Tris</b>
World Food Program	<b>WFP</b>
World Health Organization	<b>WHO</b>
Zinc	<b>Zn</b>

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## Abstract

Three species of *Moringa* namely, *M.peregrina*, *M.stenopetala* and *M.oleifera* were collected from Orman Botanical Garden, Giza in Egypt which belong to family Moringaceae for studying the morphological features, genetic polymorphism, mineral content, antioxidant and antimicrobial activities among them. Phenolics and flavonoids contents have been quantitatively measured using HPLC assay.

The results revealed that *M.oleifera* and *M.stenopetala* were similar, to some extent, in their morphological characteristics that supported by the genetic investigation using RAPD technique which grouped *M. stenopetala* and *M.oleifera* in one cluster, whereas *M. peregrina* was in a distinct one.

Moreover, there were variations among leaves and seeds of the three studied species in their antioxidant activity which claimed that *M.peregrina* gave the best yield extracts for both leaves and seeds in all used solvents. The highest total phenolic compounds and flavonoids content in leaves referred to *M.peregrina* in ethanol 70% and hexane extracts respectively, furthermore, it was the highest species to afford free radical scavenging activity with DPPH and ABTS assays in all concentrations of all extracts especially, 1000µg/ml of ethanol (70%). On the other hand, it was *M.stenopetala* seeds that provided the highest total phenolic compounds in all used extracts especially hexane and the highest flavonoids content in ethyl acetate and ethanol extracts. On another level, hexane extract was the best to yield the highest total flavonoids in *M.peregrina* seeds. By studying the free radical scavenging potency of the three species seeds using DPPH assay, it was found that hexane extract was the best solvent to reveal the highest scavenging activity and the ethanol extract of *M.stenopetala* seeds was the highest among the other two species while *M.oleifera* hexane and ethyl acetate seed extracts revealed the highest activity among others.

Quantitative estimation of phenolic compounds and flavonoids in leaves and seeds of the studied species using HPLC assay identified 25 phenolic compounds and 11 flavonoids in the leaves whereas, there were 21 phenolic compounds and 8 flavonoids in their seeds. It was clear that *M.stenopetala* leaves and seeds emerged the highest values in most of the phenolic compounds and flavonoids.

Proportions of seven minerals in leaves and seeds of the studied species were disclosed and exposed that, their seeds were higher in nitrogen content than leaves and all species had the same percentage in their seeds. Data of the three species showed up phosphorous content in leaves higher than in seeds which was on contrary from copper while leaves and seeds were conflicted in potassium and zinc content comparison. Seeds of *M.oleifera* and *M.stenopetala* were higher in manganese and magnesium content than leaves while it was *M.peregrina* leaves that showed higher content of them than in seeds.

The three *Moringa* species were evaluated for their antimicrobial activity against 19 human pathogens using agar-well diffusion assay and showed that methanolic extracts of the leaves revealed higher antimicrobial activity than those of the seeds, for all tested plant species, against the tested microorganisms which was confirmed by the detection of the MICs. *M. peregrina* leaf and seed methanolic extracts possessed the highest antimicrobial activity among the three species studied.