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In vitro Bioactivity of Methanol Extracts of *Elaeocarpus serratus* Leaves and Fruit

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Plants are getting significant attention globally and the worldwide annual market for herbal products is ~USD 60 billion. *Elaeocarpus serratus* which is an underutilized fruit crop in Sri Lanka was selected for scientific evaluation. Oven-dried mature leaves and fruit (without the seeds) were subjected to methanol extraction. It was found that the leaf extract showed high phenolic content of 100.62±7.28 mg Gallic acid equivalent (GAE)/g and flavonoid content of 14.72±0.85 mg Quercetin equivalent/g. The fruit also showed phenolic content of 157.35±4.82 mg GAE/g. The extracts showed good antioxidant activity by the DPPH assay: leaf- 38.42 ± 6.18 mg Trolox equivalent (TE)/mg and fruit- 185.95±6.07 mg TE/mg. Similarly, the extracts showed notable anti-oxidant activity by the ORAC assay: leaf- 52.45±7.61 mg TE/mg and fruit- 15.35±3.29 mg TE/mg. The leaf extract also demonstrated high anti-inflammatory activity by the human red blood cell membrane stabilization assay where the highest percentage of inhibition was recorded as 85% and an IC_{50} of 6×10^{-5} mg/ml whereas standard ibuprofen showed an IC_{50} of 5×10^{-3} mg/ml only. The leaf extract also showed a percentage inhibition of 47% by the protein denaturation egg albumin assay whereas the +ve control ibuprofen showed a similar value (51%). Further, inductively coupled plasma-mass spectrometry data revealed the presence of biologically significant both essential minerals and trace elements such as Na-125.73 ppm, Al-53.06 ppm, Fe-44.43 ppm, Mn-16.71 ppm, Zn-7.93 ppm, and Sr-6.11 ppm in the leaf extract. Furthermore, the leaf demonstrated ~40% of cell growth inhibition, while the fruit showed ~35% growth inhibition in Vero cells after 24 hours of treatment by MTT assay. This study demonstrated noteworthy anti-oxidant and anti-inflammatory activity along with essential minerals, especially in the leaf extract. Further studies are underway to elucidate additional health benefits of the leaf and fruit, by *in vitro* bioassay since the research on this underutilized plant has been minimal. This work may help to develop processed products such as new preparations of pickles/jams that will instigate economic benefits.

Keywords: *Elaeocarpus serratus, underutilized fruit plants, health benefits*