

***Antioxidant Activity of Cymbopogon citratus, Ocimum basilicum, and Etlingera elatior* Extracts Evaluated Through DPPH and ABTS Assays**

Muhammad Aiman Mohd Anwar^a, Fatimah Salim^{a*}

Structured Abstract

Background: An antioxidant is any compound that significantly slows down or stops the oxidation of a substrate. The capability of plant antioxidants to scavenge free radicals can be used to explain this protection. Medicinal, spices, melliferous, and essential oil-rich plants collectively referred to as ‘herbal plants’ constitute a very diverse category. *C. citratus*, *O. basilicum*, and *E. elatior* are Malaysian common herbs that are substantially used in culinary and exhibit antioxidant property. However, the mechanism of their antioxidant activity is less explored. Thus, the mechanism of the antioxidant activity needs to be determined. In addition, information on their different classes of chemical composition is needed to understand the antioxidant activities.

Methods: Raw samples of plants were stored at -40 °C, freeze-dried with liquid N₂, and grinded smoothly. The dried raw samples were ethanol-macerated before the obtained crude extracts were subjected to phytochemical screening. DPPH and ABTS assays were conducted.

Results: Alkaloids were found in *C. citratus* and *E. elatior* extracts, while flavonoids were present solely in *E. elatior*. All extracts contained tannins, but no saponins were detected. In the DPPH assay, *C. citratus* extract had the highest IC₅₀ value of 13.80 ppm, indicating lower antioxidant capacity. However, *O. basilicum* with an IC₅₀ of 6.96 ppm and *E. elatior* with an IC₅₀ of 7.30 ppm showed significant antioxidant capacity, outperforming ascorbic acid with an IC₅₀ of 8.63 ppm. In the ABTS assay, *C. citratus* extract exhibited better antioxidant potential with an IC₅₀ value of 6.59 ppm, surpassing both *O. basilicum* with an IC₅₀ of 7.49 ppm and *E. elatior* with an IC₅₀ of 8.10 ppm. Ascorbic acid had an IC₅₀ value of 9.41 ppm.

Conclusion: *C. citratus* extract preferred the ABTS free-radical scavenging mechanism, demonstrating better ABTS radicals scavenging, while *O. basilicum* and *E. elatior* extracts showed a preference for the DPPH free radical-scavenging mechanism.

Keywords: Antioxidants, freeze-dry, herbs, ABTS, DPPH

*Correspondence: fatimah2940@uitm.edu.my

^aSchool of Chemistry and Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia