PHYSICO-CHEMICAL PROPERTIES, ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF ESSENTIAL OIL FROM LEAVES OF *Eucalyptus camaldulensis* AND *Eucalyptus deglupta*

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ABSTRACT

Eucalyptus essential oils are known for their use in various fields such as cosmetic products, household products, pharmaceuticals, and food industries. In this study, the physico-chemical properties, antibacterial and antioxidant activities of *Eucalyptus camaldulensis* essential oil (ECEO) and *Eucalyptus deglupta* essential oil (EDEO) is reported. The percentage yield of essential oil is 0.2275% ± 0.019 (v/w) for *E. camaldulensis* leaves and 0.1810% ± 0.025(v/w) for *E. deglupta* leaves. The extracted ECEO and EDEO are very pale yellow in color. ECEO has a camphor like scent while EDEO has a strong pleasant smell. The refractive index is 1.4710 ± 0.0001 for ECEO and 1.4838 ± 0.0001 for EDEO. The specific gravity of ECEO is 0.8465 while that of EDEO is 0.8699. The peaks present in the FTIR-ATR spectra of ECEO and EDEO corresponds to the presence of aromatic C-H bending, C-O stretch, alkane C-H bending, and alkane C-H stretch. The antibacterial activities of these essential oils were tested against *Escherichia coli* and *Staphylococcus aureus*, using the Kirby Bauer disk diffusion method. Result shows that ECEO has higher antibacterial activity than EDEO for both *E. coli* and *S. aureus*.The antioxidant activities of the essential oils evaluated using 2, 2-diphenyl-1picrylhydrazyl (DPPH) showed that there is no significant difference between the radical scavenging activity of ECEO, EDEO, and ascorbic acid. Hydrosols of *E. camaldulensis* and *E. deglupta* were also investigated. The two hydrosols are colorless and has a milder scent than the essential oil. The FTIR-ATR spectra of hydrosol is similar to water and has no antibacterial activities against *S.aureus* and *E.coli*. Variation in physico-chemical properties and the pharmacological profiles of *E. camaldulensis* and *E. deglupta* provide a stimulus to further research and it is likely that more new applications will be discovered from these locally grown *Eucalyptus* species.