Biological Activities of Essential Oils Hydrodistillated from Two Closely Related Ginger Species: *Alpinia malaccensis* var. *nobilis* and *Alpinia latilabris* leaves

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ABSTRACT

The essential oils of *A. malaccensis* var*. nobilis* and *A. latilabris* were initially screened for antimicrobial activity against eleven microbes using the qualitative BacTiter Glo^{TM} kit followed by IC_{50} determination using the quantitative protocol of the same kit. The antioxidant activities were determined using DPPH radical scavenging test, ABTS and FRAP analysis. *A. malaccensis* var*. nobilis* showed inhibition of growth of 10 out of 11 microbes tested, with the most significant result observed for *C. tropicalis* and *C. neoformans* having IC_{50} of 1.75 mg/mL and 1.97 mg/mL, respectively. *A. latilabris* inhibited the growth of 8 out of 11 microbes, with the highest inhibition against *K. pneumonia*, having IC_{50} of 18.83 mg/mL. *A. malaccensis* var. *nobilis* also had a better antioxidant activity compared to *A. latilabris.* The IC_{50} for *A. malaccensis* var*. nobilis* was 32.67 mg/mL while 54.33 mg/mL for *A. latilabris*, using DPPH free radical scavenging assay. Measurements by ABTS and FRAP assays provided GAE value of 26.59 mg GAE/g and TE value of 24.56 M TE/g, respectively for essential oil of *A. malaccensis* var*. nobilis* while for *A.latilabris*, 14.47 mg GAE/g and 17.51M TE/g, respectively. GC analysis of the essential oil showed high presence of methyl cinnamate (60.26 %) and thymol (16.04%) in essential oil of *A. malaccensis* var. *nobilis* and phytol (91.75%) in essential oil of *A. latilabris*. In conclusion, *A. malaccensis* var*. nobilis* established to have generally better antimicrobial and antioxidant activities to its closely related species, *A. latilabris*.

Keywords: *Alpinia*, GC-FID, GC-MS, wild ginger, anti-yeast

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