Antioxidant activity of extracts of *Alpinia calcarata*

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Antioxidant activity of *Alpinia calcarata* (S.Heen-araththa) essential oil, cold and hot ethanolic extracts and hot water extract was determined by Thio- Barbituric Acid Reactive (TBARS) assay based on egg yolk. Vitamin E and BHT were used as positive controls. The antioxidant activity of the hot ethanolic extract was determined by DPPH° (free radical scavenging activity) assay to confirm the antioxidant activity, which was observed during the TBRAS assay. As positive controls BHT and BHA were used.

As the measurement of antioxidant activity, antioxidant index (AI) was calculated in the TBRAS assay using the following formula, AI = (1- T/ C) × 100, where, T = Absorbance of the test sample, C = Absorbance of the fully oxidized control Whereas in DPPH° assay the percentage of remaining DPPH° (% DPPH° $_{REM}$) was calculated as follows; % DPPH° $_{REM}$ = $[DPPH°]_T$/ $[DPPH°]_0$ x 100, Where T is the experimental duration time 20 min. The mean effective scavenging concentrations (EC_{50}) were calculated.

Compared to the AI of the synthetic antioxidant BHT (34.7± 0.2) and natural antioxidant vitamin E (32± 0.2), *A. calcarata* cold ethanolic extract had promising antioxidant activity (AI-35.6± 0.2). The lowest AI was in the essential oil (16± 0.3) and moderate AIs were in hot ethanolic and aqueous extracts (31.4 ± 0.4 & 26.2 ± 0.3)) of *A. calcarata*. The cold ethanolic extract had the highest antioxidant activity among the plant extracts in the TBARS assay. During the DPPH° assay hot ethanolic extract showed slightly lower antioxidant activity (EC_{50}, 14 µg/mL) than that of the BHT (EC_{50}, 8.3 µg/mL) and BHA (EC_{50}, 6 µg/mL). The DPPH° assay of cold ethanolic extract and essential oil of *A. calcarata* are in progress.

As the essential oil and the other extracts of *A. calcarata* showed antioxidant activity similar to the synthetic chemicals, these could be used as naturally occurring antioxidants instead of synthetic chemicals whenever possible.

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