

Stability of Chemical Components and Antioxidant Activity of Volatile Oils from Some Medicinal Plants in Thailand

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ABSTRACT

*The volatile oils from fresh leaves of ten medicinal plant species growing in northern Thailand were isolated by hydrodistillation method. These volatile oils were determined for their chemical components by gas chromatography coupled with mass selective detector (GC-MS) and antioxidant activity was investigated by ABTS assay, FRAP assay, lipid peroxidation assay and amount of total phenolic compounds. In addition, the stability of volatile oils in simulative condition was also studied. The major components of the extracted volatile oils were mainly terpenoid compounds, i.e., caryophyllene, D-germacrene, humulene and linalool. From the results, it can be concluded that the volatile oil of *P. fruticosa* showed the highest TEAC value of $279.79 \pm 0.35 \mu\text{M}$ trolox equivalents/mg sample while *C. bejolghota* oil showed the highest ECI value ($387.77 \pm 0.36 \mu\text{M}/\text{mg}$ sample). Moreover, the volatile oil of *K. lenta* possessed the highest lipid peroxidation value ($83.43 \pm 0.00\%$) and the highest amount of total phenolic compounds was found in the volatile oil of *S. acmella* (GAE value = $308.14 \pm 0.76 \mu\text{g}/\text{ml}$ sample). In the stability study, it was revealed that the antioxidant activity of the volatile oil from *E. odoratum* was more stable than *S. acmella* due to the stability of the chemical components towards oxidation reaction as well as humidity. It was also found that the chemical components of *S. acmella* oil were comparatively more stable than *E. odoratum* when they were preserved at -20 , 30 and 45°C under the same conditions. The simulated storage condition in this study was effectively aimed to preserve the antioxidant activity and chemical components in the extracted volatile oils. The results of this investigation clearly suggested that the volatile oils of *E. odoratum*, *S. acmella* and *P. fruticosa* possessed the highest antioxidant activity and indicated that they proved to be a good source of antioxidants that might serve to protect health and fight against diseases in the future.*

Key words: GC-MS; Volatile oil; Stability; ABTS; FRAP; Lipid peroxidation; Antioxidant