

The Effects of Soil Parameters on Efficiency of Essential Oil from Zingiber zerumbet (L.) Smith in Thailand

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Abstract : Natural products from herb have been used in different aspects of life as a result of their various biological activities. Generally, plant growth and production of secondary compounds largely depend on environmental conditions. To better understand this correlation, study on biological activity and soil parameter is necessary. This research aims to study the soil parameters which affect the efficiency of the antioxidant activity of essential oils extracted from the Zingiber zerumbet in three areas of Thailand, including Min Buri district, Bangkok province; Muang district, Chiang Mai province and Kaeng Sanam Nang district, Nakhon Ratchasima province. The soil samples in each area were collected and analyzed in the laboratory. The essential oil of Z. zerumbet in each province was extracted and tested for antioxidant activity by hydrodistillation method and DPPH (2,2-diphenyl-1-picrylhydrazyl radical) assay, respectively. The results showed that, the soil parameters such as pH, nitrogen, potassium and phosphorus elements and exchange of cations of soil specimen from Nakhon Ratchasima province were the highest ($P < 0.05$) (6.10 ± 0.03 , 0.15 ± 0.04 percent of total nitrogen, 16.67 ± 0.46 mg/L, 3.35 ± 0.65 mg/kg and 12.87 ± 0.11 cmol/kg, respectively). In addition, IC₅₀ (Inhibition Concentration of antioxidant at 50%) of Z. zerumbet essential oil collected from Nakhon Ratchasima showed the highest value ($P < 0.05$) ($1,400 \mu\text{g/mL}$). In conclusion, the soil parameters are once important factor for the efficiency of essential oils extract from Z. zerumbet.

Keywords : antioxidant, essential oil, herb, soil parameter, Zingiber zerumbet

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