Nopparat Mahae 2009: Fishy Odour Deodorisation and Natural Antioxidant Properties of the Extracts from Rhizome of *Alpinia galanga* (L.) Sw. Doctor of Philosophy (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Associate Professor Siree Chaiseri, Ph.D. 131 pages.

This study investigated fishy odour deodorisation ability and antioxidant activity of the extracts from galangal rhizomes (*Alpinia galanga*). The extracts were obtained by three processes: water extraction, ethanol extraction and essential oil extraction. In fishy odour deodorisation study, the crude extract from fresh rhizomes was also used. Volatile compounds were evaluated using gas chromatography-mass spectrometry (GC-MS). The most abundant volatile component in the essential oil was 1,8-cineol (18.91%). The most abundant volatile compound in crude extract (32.65%) and ethanol extract (61.03%) was tentatively identified as 1′-acetoxychavicol acetate. The crude extract also contained high 1,8 -cineol (17.33%). Water extract had the unknown ($[M]^+$at *m/z*=192) that comprised 76.04% of the volatiles. The content of phenolic compounds and flavonoids in the extracts were also evaluated by high performance liquid chromatography (HPLC). Ethanol extract had the highest total phenolic compounds (31.49 mg GAE/g extract) and flavonoids (13.78 mg CE/g extract). Fishy odour reduction abilities of the extracts were studied by sensory evaluation of the model systems containing trimethylamine (TMA) and (*Z*)-4-heptenal. All extracts were more effective in reducing fishy odour from TMA than that from (*Z*)-4-heptenal. Among all galangal extracts, the crude extract was the most effective in deodorisation of fishy odour from TMA. This was followed by ethanol extract. Essential oil and water extract were less efficient in reducing the TMA fishy odour. The Principal Component Analysis (PCA) and the correlation indicated that fishy odour deodorisation was correlated with the concentrations of alcohols, acids, phenolic compounds and unknown compounds. Water extracted, ethanol extracted and essential oil samples were evaluated for their antioxidant activities by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ORAC methods. The results showed that the ethanol extract had the highest antioxidant activity. The IC_{50} of water extract, ethanol extract, essential oil, α-tocopherol and BHA were 55.48, 10.66, 455.43, 1.45 and 0.41 mg/mL, respectively. This study showed that ethanol extract of galangal could be used to reduce fishy odour and oxidation in food products.

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