

Poster code:

B11

Feasibility Study on the Extraction Methods of Essential Oil from Pineapple Peels

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Abstract. The pineapple industry produces a substantial amount of solid waste like peels, cores, stems, crowns and pulp. Pineapple waste disposal can cause to microbial spoilage and environmental problems due to the waste material containing high moisture and sugar content. Utilization of pineapple waste, focusing on the peels, to produce a high value added product of essential oil is a good option. However, up to date, there are only a very limited studies specifically aimed on the extraction methods of essential oil from pineapple peels. Therefore, the aim of this study was to demonstrate a feasible method for extraction of essential oil from pineapple peels. Three methods used in the study were (1) hydro- distillation (HD), (2) hydro-distillation with enzyme-assisted pretreatment (HDEA) and (3) supercritical fluid extraction (SFE). Among the methods used, only SFE method resulted in the formation of essential oil with 0.17% (w/w) yield, whereas HD and HDEA methods only produced the hydrosol. The microscopic observation using scanning electron microscope of the sample's cell wall substantiated that only SFE method resulted in the rupture the essential oil gland after the extraction. The GC-MS analysis showed that volatile compounds mainly identified in the essential oil produced through SFE method were propanoic acid ethyl ester (40.25%), lactic acid ethyl ester (19.35%), 2-Heptanol (15.02%), 3-Hexanone (2.60%) and butanoic acid ethyl ester (1.58%). The analysis results show that pineapple peels contained of important volatile compounds, thus indicating its' potential to be used as substrate for the aromatic essence production.

Keywords: pineapple peels, essential oil, hydro-distillation (HD), hydro-distillation with enzyme-assisted pretreatment (HDEA), supercritical fluid extraction (SFE)