

Rungrudee Pornsakulloeschai 2007: Study on *Zingiber cassumunar* Roxb. Essential Oil Extraction Using Microwave Method. Master of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Assistant Professor Siwalak Pathaveerat, Ph.D. 140 pages.

This research is to study the comparative of the three various kinds of extraction process of essential oil in *Zingiber cassumunar* Roxb. Higher than atmospheric pressure distillation with Portable Steam Distillation Unit (PSDU), lower than atmospheric pressure distillation with Rotary Evaporator (RE) and at atmospheric pressure distillation, which has three test methods 1) Hydro Distillation (HD) 2) Microwave Extraction (ME) 3) Ultrasonic-assisted Microwave Extraction (UME). All three methods, distillation time tests are 10, 20, 30, 40, 50 and 60 minutes and by UME, the samples have been distilled by ultrasonic for 10, 20 and 30 minutes before making microwave extraction. The expecting results from this study are yield and quality of essential oil in *Zingiber cassumunar* Roxb.

From this study, The extraction of essential oil from PSDU method is 0.5060 %w/w, the quality is dark yellow color and burnt fragrance, yield from RE is rather small but the quality is clear-yellow color and plant fragrance. At 40 minutes from ME has the highest yield, 1.0374 %w/w. The yield from HD is 0.92 %w/w at 60 minutes. Using UME has no mean in effecting to the received amount but significant in active chemical by using Gas Chromatography (GC) : higher sabinene,  $\gamma$ -terpinene,  $\alpha$ -terpinene and DMPBD than PSDU and ME

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