

Effect of Power Variation on Beluntas Essential Oil Using *Microwave Assisted Evaporation and Microwave Assisted Hydro Distillation*

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ABSTRACT

*Indonesia has great potential for the development of essential oils due to its abundance of aromatic plant resources. One plant with significant potential that has not yet been widely utilized is beluntas (*Pluchea indica* L.). This study aims to determine the most effective concentration method and to analyze the effect of varying microwave power on beluntas essential oil production. The initial stage involved macerating beluntas leaves using n-hexane as a solvent for 12 hours to dissolve and maximize the release of essential oil components prior to the concentration process. This study was conducted in two phases: a comparison of Microwave Assisted Evaporation (MAE) and Microwave-Assisted Hydrodistillation (MAHD), as well as an analysis of power variations in the optimal method. In the first stage, both methods were tested using Medium Power (777.0 ± 0.192 Watts) for 45 minutes. The results showed that MAE yielded a higher yield ($2.92 \pm 0.09\%$) compared to MAHD ($2.19 \pm 0.285\%$) with a statistically significant difference ($p < 0.05$). The second stage used MAE with three power treatments: control, Medium Low Power (761.5 ± 0.325 watts), and Medium Power (777.0 ± 0.192 watts). The highest yield was obtained in the Medium Low Power treatment ($3.42 \pm 0.26\%$), followed by Medium Power ($3.14 \pm 0.23\%$), and the control ($1.59 \pm 0.00\%$). GC-MS results for the control treatment showed 63 major compounds detected in beluntas essential oil, while in the MAE treatment with the highest yield, 67 compounds were detected, dominated by terpenes, long-chain alcohols, phenylpropanoids, and free fatty acid esters.*

Keyword : Beluntas Essential Oil, Maseration, MAE, MAHD, Microwave Power Variation, Yield, GC-MS