

**Agro-Morphologies and Physicochemical Properties  
of Flower Bud, Stem and Leaf Oils in Two Clove Varieties  
(*Syzygium aromaticum* L. Merr. and Perry.)  
Originated from Ambon Island**

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**ABSTRACT**

*The cloves of Tuni and Zanzibar varieties from Ambon Island have morphological differences that affect the production and quality of the clove oil produced. This study aimed to evaluate the characteristics of the agro-morphology and physicochemical properties of clove oil of the two varieties. The standard color determination was performed visually, specific gravity was using pycnometer, refractive index using a refractometer, and 70% ethanol solubility using silver nitrate 0.1 N. Total eugenol was determined using 4% Potassium Hydroxide (KOH) solution, while  $\beta$ -caryophyllene was analyzed using gas chromatography technique (GC) Agilent Technologies 6890N. The study of morphological aspect and essential oils characteristics of two clove varieties demonstrated large variability of this species grown in Ambon Island. Results of this study revealed that the highest oil content was found in bud oil of Zanzibar variety, while the lowest was in leaf oil of Tuni variety. In addition, Zanzibar variety tends to contain higher volatile oil content than Tuni. Furthermore, it was found that Tuni variety contained total eugenol in flower bud oil, stem, and leaf slightly higher than Zanzibar variety, with about 84%, 98%, and 78%. This finding implies that the whole clove oil from the different morphological parts of the two varieties fulfilled the standard of clove oil, although there was a slight different of a higher  $\beta$ -caryophyllene content. The PCA results showed that the oil content in the flower bud section was high. The increase in flower weight and oil content was not always followed by an increase in eugenol content.*

**Keywords:** Aroma, Essential oil, Eugenol, Volatile compound.