# Studies on Indonesian Essential Oils

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PROCEEDING OF 4TH ICOWOBAS-RAFSS 2013

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**ABSTRACT**

Based on a desire to improve the quality of Indonesian essential oils, several studies on the purification and transformation of the main component of essential oils have been done. Researchs on the purification were conducted using zeolite as adsorbent and using EDTA as chelating agent. The quality of essential oil can also be improved by chemical transformation of a major content into another compound generating better scent or possessing bioactivity. Furthermore the bioactivity of some essential oils was tested directly. Beside the development in scientific aspect, it is necessary to develop an application of essential oils in daily need.

| Indonesian essential oil, purification, transformation |



## 1. INTRODUCTION

Essential oil is one of the Indonesian reliable export commodities. The richness of biodiversity allows Indonesia to become the principal supplier of essential oil in the world market. However, the fact is from about 70 kinds of essential oils released in the world market - 40 kinds can be produced in Indonesia - only 14 Indonesian essential oils possessing a significant role as an export commodity with total share of the world market just about 2.6%. Until now, Indonesia can only export crude essential oils with low value. Conversely, Indonesia imports some crude and processed essential oils with much greater value than the export. Thus in calculation, the Indonesian trade balance of essential oils is minus (Rizal *et al*., 2006).

Basically, Indonesian essential oils production faces two main problems that are low quality and unstable price caused by unsteady quality. Therefore, it is required a new simple innovations technique to be applied to improve the quality of essential oils produced by the traditional farmers. This effort will increase the competitiveness of Indonesian essential oil in world market. Based on these problems, the author has performed some research focusing on the Indonesian essential oils, both from the basic research and from applicative aspects.

## 2. PURIFICATION OF ESSENTIAL OILS

The author has conducted a research on the purification of clove oil produced by traditional farmers using adsorption methods with zeolite as adsorbent, a material found in abundance in Indonesia. The result showed that zeolite can be used in purification process of turbid clove oil caused by iron contamination from boiler (Kristanti, 2010). Purification of clove oil using EDTA as chelating agent has also been performed and showed promising result to be applied. Furthermore, the coordination compound (Fe – EDTA) produced from this process can be used as fertilizer as shown in the research. In conclusion, there is no waste product in this process (Kristanti, A.N., 2011).

## 3. TRANSFORMATION OF MAJOR COMPONENT IN SOME ESSENTIAL OILS

In the chemistry point of view, improving selling value of essential oil can be achieved by chemical transformation of a major content of essential oil into another compound generating better scent or possessing bioactivity. In these circumstances, we have transformed some essential oils into another compound which later can be used as fragrance or as starting material in the synthesis of bioactive compound.

To produce fragrance, we have successfully transformed eugenol – a major compound of clove oil – into methyl eugenol and its epoxide derivative. In addition, we have also transformed menthol – a major content of peppermint oil, and citronellal – a major content of lime oil. To produce bioactive compound, we have transformed eugenol into a derivative of acetophenone. This compound is further used as reactant in the synthesis of a chalcone which is usually shows variety of bioactivity, such as anticancer, antimalarial, antibacterial, etc. We have also transformed vetiverol (a major content of vetiver oil) into its pyrazoline derivatives and showed anticancer activity. We used cinnamaldehyde (major content of cinnamon oil) as a reagent in the synthesis of a bichalcone possessing antibacterial activity.

## 4. BIOACTIVITY of ESSENTIAL OIL

We tested also directly the bioactivity of some essential oils, that are patchouli oil and clove oil which possesses anti-mosquito against *Culex fatigans*.

## 5. CONCLUSION

From these studies it appears that there are still many things to be done so that Indonesian essential oil can develop with good quality, quantity and utilization

## REFERENCES

[1] Kristanti, A.N.; Aminah, N.S.; Suwito, H., 2010, Upaya peningkatan sensitivitas dalam meneliti pada mahasiswa melalui induksi permasalahan minyak atsiri di indonesia**, Teaching Grant Report**, PHK-I Batch I Universitas Airlangga 2010

[2] Kristanti, A.N., Suwito, H., Hamami, Tanjung, M., 2011, Diversifikasi Industri Atsiri Indonesia : Pproduksi Eugenol dan Ppatchouli Alkohol Kualitas Eksport serta Pupuk Kombinasi, **Competitive Collaborative Research Report** Fakultas Sains dan Teknologi Universitas Airlangga

[3] Rizal, M.; Djazuli, M., 2006, **Strategi Pengembangan Minyak Atsiri Indonesia**, *Warta Penelitian dan Pengembangan Pertanian*, 28(5),13-14

[4] Some script topic in Chemistry Department, Faculty of Science and Technology, Airlangga University

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