



## Comparison of total phenolic and flavonoids contents in Malaysian propolis extract with two different extraction solvents

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**Abstract** - This study was aimed to obtain propolis extracts by using two different solvents which are ethanol and water via maceration method and to evaluate the total phenolic and flavonoid components of the extracts. Optimization of the extraction process was done by using different solvents and sample-to-solvent ratio. The ethanolic and water extracts were analysed for the determination of Total Phenolic Content (TPC) and Total Flavonoid Content (TFC) by using Folin-Ciocalteu colorimetric method and Aluminium chloride method, respectively. Based on sample-to-solvent ratio, it showed that 1:10 gave the highest percentage yield of extracts compared to other ratio for both solvents. The resulting ethanolic extract contains high phenolic and flavonoids content compared to water extract. The result showed that sample-to-solvent ratio of 1:5 gave highest TPC and TFC in ethanolic extract which are 29.09 and 7.75 mg GAE/g, respectively. In conclusion, this study revealed that ethanol is the best extraction solvent to be used for propolis extraction compared to water. It is also demonstrated that higher volume of solvent does not leads to high values of TPC and TFC. The optimum extraction parameters and conditions are necessary to be obtained in order to extract high TPC and TFC.

**Keywords** – propolis, Folin-Ciocalteu, maceration, phenolic, flavonoids.

### I. INTRODUCTION

Propolis, known as bee glue [1], is a natural, sticky resinous, balsamic, dark yellow to brown colored and strongly adhesive bee product [2]. Generally, it serves as a substance to protect the bee hive from invaders while providing a disinfecting environment for the bees to lay their eggs [3]. A crude propolis generally contains 50% resin, 30% wax, 5% pollen, 10% aromatic oils and 5% other organic residues [4]. The colour and chemical composition of propolis are highly influenced by its geographical origin and the types of plant the bees accessed [5]. Thus, the propolis collected by the bees from different types of plant at different location may have colours vary from one another. The colours may differ from yellowish green to red and to dark brown and it is influenced by its age [6].

In Malaysia, the number of stingless bee species varies between 17 to 32 species depending on the study areas [7-9]. Five species of stingless bee and unidentified species were found in a bee farm located in the state of Kelantan, Malaysia [10]. The species were *Trigona (Geniotrigona) thoracica*, *Trigona (Heterotrigona) itama*, *Trigona (Lepidotrigona) terminata*, *Trigona (Lisotrigona) scintillans*