Hepatoprotective Effect of *Trigona spp.* Bee Propolis against Carbon Tetrachloride-Induced Liver Injury in Rats

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Abstract

Background: Oxidative stress reaction can cause liver injury. This process can be prevented by antioxidant activities which can break the destructive chain caused by free radical substances in the liver. Propolis produced by *Trigona spp.* bee is known to have a high level of antioxidant. The aim of this study was to examine the effect of *Trigona spp*. bee propolis on liver histological toxicity caused by carbon tetrachloride-induced oxidative stress.
Methods: This experimental study was conducted in September 2013 at the Animal Laboratory of Departement of Pharmacology and Therapy, Faculty of Medicine Universitas Padjadjaran. Twenty-four healthy male Wistar rats as objects were adapted for one week and randomly divided into 3 groups. Group I was the control negative, group II was given carbon tetrachloride on day 14, group III was given *Trigona spp.* bee propolis on day 1-14. On day 14, group III was injected CCl4 intraperitoneally. The quantitative data were statistically analyzed using the one way ANOVA and Tukey test with p value < 0.05.
Results: Group I showed the liver contained normal cells, without significant injury of the membrane, round and complete nucleus. The average number of liver cell was 464 ± 9.59281 cells/field; group II underwent necrosis and the average of the cells was 146 ± 7.56885 cells/field; group III showed some normal liver cells, and some necrotic area with the normal liver cells average was 263 ± 14.10860 cells/field. The p-value=0.00.
Conclusions: *Trigona spp.* bee propolis has a hepatoprotective effect against CCl4-induced liver injury histologically. **[AMJ.2016;3(3):482–6]**

Keywords: Carbontetrachloride, hepatoprotective, propolis, *Trigona spp.*

Introduction

Hepatitis is still a serious health problem in Indonesia. According to *Riset Kesehatan Dasar* (Riskesdas) Nasional 2007, Indonesia was placed as the second largest country among other SEARO countries with hepatitis patients.[1] In October 2007–2009, the Ministry of Health of the Republic of Indonesia reported about 17.999 positive hepatitis C cases. Infection with hepatitis C is associated with increased levels of Reactive Oxygen Species (ROS)/Reactive Nitrogen Species (RNS) and decreased antioxidant levels.[2] ROS/RNS is a cause of oxidative stress.

Oxidative stress is a condition where there is a high level of free radicals; one of the potential substance is carbon tetrachloride which has strong connection with pathologic process like cell destruction.[3] Currently, it is commonly used for inducing hepatitis model in laboratory experimental animals. When carbon tetrachloride enters the body, this substance will be metabolized in the liver and will produce free radical such as trichloromethyl radical (CCl3) and trichloromethyl peroxy radical (CCl3O2) that induce lipid peroxidation and death of the cell.[4] One substance that can prevent lipid peroxidation is antioxidant. Furthermore, propolis is a natural product, which is a mixture of resin and beeswax collected from plants particularly from flowers and leaf buds by honey bees (*Apis spp.* and *Trigona spp.).* It contains many chemical substances and varies depending on the plants resin geographically. The *Trigona spp.* bee are found on many islands in the Indonesian region and it has already been studied that it has more antioxidant substance than the

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