

Effect of Gelam Honey on Liver of Sprague Dawley Rats through Histomorphometric Analysis

Nur Dalila Zahari^a, Nur Hilwani Ismail^{a, b, c*}

Structured Abstract

Background: The liver is the main organ that is made up from hepatocytes cells, accounting for 60% of total cells and 80% of liver volume. Honey, can be considered a potential therapeutic for many diseases as it contains organic acid, flavonoids, vitamins, and enzymes that can be used for treatment. Gelam honey, a type of Malaysian honey obtained from the flowers of the Gelam tree or *Melaleuca cajuputi* collected and produced by *Apis Dorsata* bees has been introduced as one of the honeys used for treatment because it offers numerous benefits. This study aims to observe the condition of liver organ cells of normal rats given varying doses of honey.

Methods: The method that was used in this study is histological examination. The liver organ of the Sprague Dawley rat was donated by Gamete Research Group, Department of Physiology, Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM). There were three groups: the control group, Gelam honey low dose (0.2 g /kg bw) and Gelam honey high dose (2.0g/kg bw). The harvested organs were processed through fixation, trimming, embedding, and sectioning. For histological staining, Hematoxylin & Eosin stain was used. A light compound microscope with a 40X objective was used to observe and compare the morphology and histomorphometrics of the hepatocyte cells.

Results: The results showed the effects of Gelam Honey on conditions of the hepatocyte cells from three different groups after 14 days of supplementation. There were significant differences across all groups for normal hepatocyte cells, $H(2) = 13.345$, $p = 0.001$; abnormal hepatocyte cells, $H(2) = 15.726$, $p < 0.001$ and the regeneration of hepatocyte cells, $H(2) = 152.797$, $p < 0.002$. ANOVA post-hoc test showed that GHL group recorded higher regeneration of hepatocytes ($F(2,15) = 49.426$, $p < 0.001$).

Conclusion: From this study the best doses of Gelam honey on normal healthy liver is 0.2 g Gelam honey/kg bw (GHL). At this dose, the liver organs showed normal gross morphology of liver comparable to control group.

Keywords: Hepatocyte, Gelam Honey, Liver morphology, liver histomorphometric, *Melaleuca cajuputi*

*Correspondence: hilwani@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia.

^b Human Genetics and Biochemistry Research Group (HuGeB), Universiti Teknologi MARA, Shah Alam, Malaysia.

^c Department of Physiology, Faculty of Medicine, Level 18 Pre-Clinical Building, Universiti Kebangsaan Malaysia, Batu 9 Cheras, Kuala Lumpur.