

Effect of Gelam Honey on Renal Morphology of Sprague Dawley Rats

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Structured Abstract

Background: The glomerulus, a unique collection of capillaries that are not bordered by interstitial tissue, are all confined within the Bowman's capsule. The renal tubules such as proximal convoluted tubule (PCT) is easily affected by what we consume as they function to filter and reabsorb remaining nutrients into the body. Gelam honey is rich with several therapeutic properties such as antioxidants and anti-inflammatory agents. It has been identified to lessen oxidative damage. This study aims to determine the effect of different doses of Gelam honey on glomeruli morphology and proximal convoluted tubule morphology in rats.

Methods: The method that was used in this study is histological observation. The kidneys of Sprague Dawley rat were donated by Gamete Research Group, Universiti Kebangsaan Malaysia (UKM). There were three groups: control group, 0.2g Gelam honey/kg bw (GHL group) and 2.0g Gelam honey/kg bw (GHH group). The harvested organs underwent fixation, tissue processing, embedding and sectioning. Haematoxylin and Eosin (H&E) staining was used to visualize the tissue. A light microscope (Leica Microscope with a digital camera) was used to observe at 40X magnification and the glomerular diameter and PCT thickness were measured by ImageJ software.

Results: The study examines the effect of Gelam honey on glomerular diameter and PCT thickness after 14 days of consumption. The glomerular diameter of the control group was $172.305 \mu\text{m} \pm .091 \mu\text{m}$. GHH group recorded a wider glomerular diameter compared to the GHL group ($163.452 \mu\text{m} \pm 2.89 \mu\text{m}$). The PCT thickness of the Control group was $180.130 \mu\text{m} \pm 1.59 \mu\text{m}$. GHH group recorded a thinner PCT thickness compared to GHL group ($143.117 \mu\text{m} \pm 5.99 \mu\text{m}$). One-way ANOVA result showed a significant difference between groups of glomerular diameters and PCT thicknesses.

Conclusion: This study determined a significant difference in average glomerular diameter (Control and GHL) and PCT thickness (Control and GHH). Gelam honey significantly improved kidney health by increasing glomerular diameter and decreasing PCT thickness, especially at a daily dose of 2.0g Gelam honey/kg bw due to its antioxidant properties.

Keywords: Kidney; Gelam honey; Glomeruli; Proximal Convoluted Tubule

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