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**Effect of Tualang Honey-Mediated Silver Nanoparticles on TNF- $\alpha$  level, Caspase-3 Activity and Hippocampal Morphology in Kainic Acid-Induced Neurodegeneration in Male Rats**  
(2024) *IJUM Medical Journal Malaysia*, 23 (4), pp. 93-101.

DOI: 10.31436/ijm.v23i04.2223

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### Abstract

**INTRODUCTION:** Despite being common disorder, the curative treatment for degenerative diseases are not yet available. Although Tualang honey (TH) has been reported to protect against neurodegeneration, but the effect of TH-mediated silver nanoparticles (THSN) on neurodegeneration is poorly understood. Thus, we conducted this study aimed to determine the effects of THSN on the levels of tumour necrosis factor alpha (TNF- $\alpha$ ), caspase-3 activity, and hippocampal morphology in Kainic Acid (KA) induced neurodegeneration in rats. **MATERIALS AND METHODS:** A total of 72 Male Sprague Dawley rats were randomized into six groups which were the control, THSN 10mg, THSN 50 mg, KA only, KA+THSN 10 mg, and KA+THSN 50 mg groups. Each group was pre-treated orally with either distilled water or THSN (10 mg/kg or 50 mg/kg), according to their respective group. Following the last pre-treatment, each rat was injected with KA (15 mg/kg) or saline. After 24 h and 5 days of KA induction, all rats were sacrificed, and the hippocampus from each rat was harvested. Cresyl Violet and Fluoro Jade C staining were carried out to examine the number of viable cells and degenerating neurons. TNF- $\alpha$  level and caspase-3 activity in the hippocampus were measured using commercially available ELISA kits. **RESULTS:** Rats with KA-induced neurodegeneration demonstrated a significant increase ( $p < 0.05$ ) of TNF- $\alpha$  level and caspase-3 activity with a lower number of viable cells and increased number of degenerating neurons in the hippocampus. The pre-treatments of THSN groups improved these changes by lowering the TNF- $\alpha$  level and caspase-3 activity and decreasing the number of degenerating neurons. **CONCLUSION:** THSN could have potential neuroprotective effects in ameliorating TNF- $\alpha$  level, caspase-3 activity, and hippocampal damage in KA-induced male rats. © 2024 xxxx

### Author Keywords

Caspase-3; Rats' Hippocampus; Silver Nanoparticles; TNF- $\alpha$ ; Tualang Honey

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**Publisher:** International Islamic University Malaysia

**ISSN:** 27352285

**Language of Original Document:** English

**Abbreviated Source Title:** IIUM Med. J. Malaysia.

2-s2.0-85206329824

**Document Type:** Article

**Publication Stage:** Final

**Source:** Scopus

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