

Tulang Honey Formulation as Potential Osteoarthritis Treatment: *In-vitro* Genotoxicity Outcome

¹Nour El Huda, AR; ²Zulkify, AH; ²Mohd Jan, NH; ²Ibrahim, MZ; ²Mohamad Amri, NF; ²Hassan, H; ³Rajab, NF

¹Department of Basic Medical Sciences, Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, Malaysia.

²Department of Orthopaedics, Traumatology and Rehabilitation, Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan, Malaysia

³Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

INTRODUCTION:

Osteoarthritis (OA) is a degenerative joint disease affecting millions worldwide. In the orthopaedic field, viscosupplementation is used as an option treatment for pain relief among osteoarthritis patients. Tulang Honey Formulation (THF) (Patent no. MY179303-A) is currently being studied as a viscosupplement option for OA treatment. This study aimed to investigate the cell mutagenic effect after exposure to THF towards biocompatibility profile.

MATERIALS & METHODS:

The bacterial tester strains (TA98, TA100, TA1535, TA1537 and WP2) were used to evaluate the mutagenicity of different concentrations of THF in the presence and absence of metabolic enzymes. The negative control was 0.9% NaCl. The positive controls were 4-nitro-o-phenylenediamine and 2-aminoanthracene. A total of 0.1ml of each concentration of THF was mixed with 0.5ml of buffer/S9 mix, followed by the addition of 0.1ml of each tester strain suspension. The mixture was then shaken in a water bath for 20-30 minutes at 37°C. The samples then were incubated at 37°C for 48 hours. The revertant colonies then were counted.

RESULTS AND DISCUSSIONS:

Figure 1 shows the number of colonies grown on the plates (revertant bacterial colonies counts) in all strains. The number of revertant colonies treated with the THF did not exceed twice the number of the negative control either in the presence or absence of metabolic activation. The negative and positive controls used in this study responded as expected. The

outcome of this study showed that THF did not demonstrate a mutagenic effect on all bacterial strains, which indicated that THF could be used safely as a viscosupplement in OA treatment.

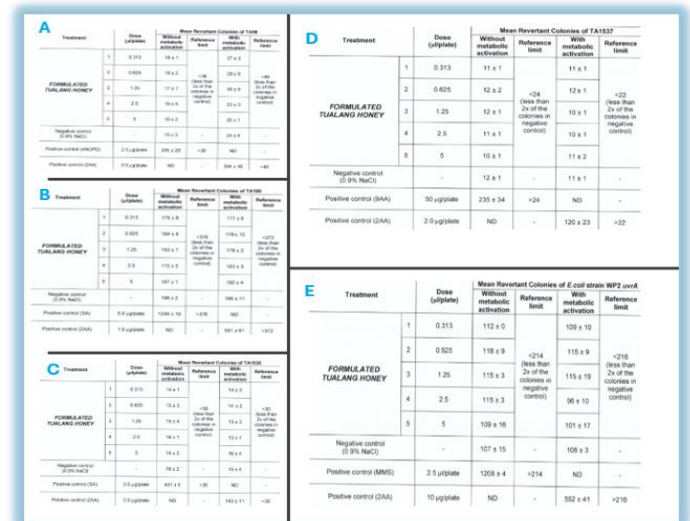


Figure 1: Revertant colonies A: *S. typhimurium* TA98 B: *S. typhimurium* TA100 C: *S. typhimurium* TA1535 D: *S. typhimurium* TA1537 and E: *E. coli* strain WP2 *uvrA* induced by THF in the present and absence of metabolic activation system.

CONCLUSION:

Based on the findings of this study, THF is a non-mutagenic and biocompatible. This outcome shows that THF is a potential viscosupplement for OA treatment in future.

REFERENCES:

1. Carlos M.A et al.; Therapeutic Potential of Bioactive Compounds in Honey for Treating Osteoarthritis; Front. Pharmacol. doi: 10.3389/fphar.2021.642836.
2. Mohammad Samiel et al.; Investigating the Mutagenic Effects of Three Commonly Used Pulpotomy Agents Using the Ames Test; Adv Pharm Bull, 2015, 5(1), 121-125.