

**COMPARISON OF ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF SRI LANKAN STINGLESS BEE PROPOLIS (*Tetragonula iridipennis* AND *Tetragonula praeterita*) USING TWO EXTRACTION METHODS**

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Propolis is a resinous product of stingless bees. The composition and bioactivity of propolis extracts depend on the bee species, ecosystem and extraction method. Sri Lankan propolis has not been investigated. Therefore, this study aimed to compare the antioxidant and antimicrobial activity of propolis of two bee species: *Tetragonula iridipennis* (TI) and *T. praeterita* (TP) collected from Kandy, Sri Lanka. Ethanol extracts of the two propolis samples were prepared using Soxhlet (TI-SOX, TP-SOX) and sonication (TI-SONI, TP-SONI) methods, and percentage extraction yields were determined. Antioxidant and antimicrobial activity of the extracts were determined in triplicates using 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay and agar dilution method by determining minimum inhibitory concentrations (MIC), respectively. Soxhlet method gave a higher percentage extraction yield for both propolis samples. TI-SONI and TI-SOX showed significant antioxidant activities (IC<sub>50</sub> of 9.805 ± 0.270 and 5.942 ± 0.046 mg L<sup>-1</sup>, respectively) with values closer to the IC<sub>50</sub> of L-ascorbic acid (5.210 ± 0.059 mg L<sup>-1</sup>). IC<sub>50</sub> of TP-SONI and TP-SOX were 269.2 ± 6.741 and 411.0 ± 9.302 mg L<sup>-1</sup>, respectively. Antimicrobial activity was tested against three gram-negative (*Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*), three gram-positive (*Staphylococcus aureus*, methicillin-resistant *Staphylococcus aureus*-MRSA and *Enterococcus faecalis*) bacterial strains and *Candida albicans* within the concentration ranges of 16 – 128 mg L<sup>-1</sup>. All extracts were inactive against *C. albicans*. TP extracts did not show antibacterial activity. TI extracts were only active against gram-positive bacterial strains (MIC values of 16 – 32 mg L<sup>-1</sup>). Therefore, the bee species and extraction method have an impact on the extraction yield and bioactivity. TI extracts show remarkable antioxidant and antibacterial activity against gram-positive bacteria and would be a potential source of antibacterial and antioxidant compounds.

**Keywords:** Minimum inhibition concentration, Sonication method, Soxhlet method