

Antioxidant and Anti-inflammatory Constituents from Taiwanese Propolis

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Propolis is a resinous hive substance collected by honeybees from the buds and exudates of certain plants. It has a long history of being used in folk medicine from ancient times. Pharmacological activities such as antimicrobial, anti-inflammatory, anticancer, and antioxidant have been described. Hence, propolis is thought to prevent diseases such as inflammation, heart disease, diabetes, and cancer. The aim of this study is to evaluate the biological activities of Taiwanese green propolis ethanolic extract as well as its chemical composition.

The ethanolic extract possessed total phenolic content (335.2 ± 3.2 mg CE/g dry weight) and total flavonoid content (26.2 ± 0.3 mg QE/g dry weight). The antioxidant activity of this extract was evaluated by DPPH and TEAC assays. This extract showed significant DPPH radical scavenging activity ($IC_{50} = 12.45 \pm 0.11$ μ g/ml) and ABTS radical cation (ABTS^{•+}) scavenging activity with TEAC value of 0.40 ± 0.01 mg/ml. A *p*-Coumaric acid derivative, 4-geranyl-*p*-coumaric acid (**1**), as well as six known geranyl flavanones, propolin A [5,7,3',4'-tetrahydroxy-2'-C-(7''-hydroxy-3'',7''-dimethyl-oct-2''-enyl)flavanone] (**2**), 5,7,4'-trihydroxy-3'-C-geranylflavanone (3-geranyl-naringenin) (**3**), nymphaeol-A (**4**), nymphaeol-B (**5**), nymphaeol-C (**6**), and propolin E (**7**) were isolated from the ethanolic extract of the Taiwanese green propolis. The antioxidant and anti-inflammatory activities of these isolated compounds were also evaluated.