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Constituents of Water Extract of Brazilian Propolis, Their Biological Properties and Botanical Origin

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[Introduction] Propolis is a sticky material collected by honeybees from various plants source, which is used by bees to protect their hive. Propolis has been widely used as a popular remedy in folk medicine from ancient times in many regions of the world, and possessed various biological activities including antimicrobial, antibacterial, antiviral, viricidal, anti-inflammatory, immunomodulatory, antioxidant, antihepatotoxic, antidiabetes and even anticancer activities. Because of its complex nature and variety of sources the constituent of propolis is not fully understood, however, more than 300 compounds including flavonoids and cinnamic acid derivatives have been reported so far from propolis mainly from alcoholic extract or propolis balsam (90% EtOH extract). Only few work have been done on water extract of propolis, and thus in the present work we focused on the water extract of Brazilian propolis.

[Result and Discussion] Brazilian propolis (1.0 kg) was extracted with distilled water at 80°C to give water extract (116 g). Seventeen phenolic compounds, four benzoic acid derivatives, six cinnamic acid derivatives, two prenylated cinnamic acid derivatives, three caffeoylquinic acids, a chromene and 1-(4-hydroxyphenyl)butane-1,3-dione were isolated. All of these compounds were isolated for the first time from the water extract of Brazilian propolis except for methyl 3,4-di-*O*-caffeoylquinic acid and 3,4-di-*O*-caffeoylquinic acid. Moreover, methyl *p*-hydroxydihydrocinnamate and 1-(4-hydroxyphenyl)butane-1,3-dione were isolated for the first time from propolis. Methyl 3,4-di-*O*-caffeoylquinic acid, caffeic acid, methyl caffeate and chlorogenic acid possessed strong DPPH radical scavenging effect. In addition, LC-MS analysis revealed that the bud of *Baccharis dracunculifolia* should be prominent source of caffeoylquinic acids, active ingredients of the water extract of Brazilian propolis.