Phenolic extract from Propolis and bee pollen: composition, antioxidant and antibacterial activities

Abstract

Bee products (e.g., propolis and bee pollen) are traditional healthy foods. In this study, antioxidant properties and *in vitro* antibacterial activity of honeybee pollen and propolis methanol extracts were determined. Propolis with higher phenolic content showed significant greater activity over pollen extracts. Caffeic acid, ferulic acid, rutin, and *p*-coumaric acid were detected as main phenolic compounds in propolis extract. 3,4-Dimethoxycinnamic acid was the major phenolic component in pollen extract. Propolis extract (5 μg/mL) exhibited 28% antiradical action against 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals. The scavenging activity of propolis and pollen extracts against 2,2′-Azinobis (3-ethylbenzothiazoline-6 sulfonic acid) (ABTS) reached a maximum of 94.3 and 76.5%, respectively, at an extract concentration of 25 μg/mL. Stabilization factor of propolis extract was 13.7, while it was 6 for pollen. Results revealed that both extracts showed highly antibacterial action against gram-positive bacteria with a minimal inhibitory concentration ranging from 0.2 to 0.78 mg/mL. To best of our knowledge, this is the first study showing elevated antibacterial activity against gram-negative bacteria *Salmonella enterica*.