**Investigation of phytochemical and bioactivity of water-based Turkish propolis**

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| **Abstract**  Propolis is the general name of the resin material collected by honey bees from various natural plant sources. Propolis is a sticky gum with a resin structure that varies in color from dark brown to green and yellow related to the origins and age of the bee [1]. People's widespread use and preference of propolis in folk medicine have a long history, and these are antioxidant, hepatoprotective, antimicrobial, antiprotozoal, antitumor, antibacterial, antifungal, antiviral, anti-inflammatory, and anticancer [2]. This study aimed to evaluate the antioxidant, antibacterial, anti-enzymatic, and DNA protective activities of propolis aqueous extracts stored (+4, -80, -196) and pulverized propolis (PP) extracts in different cold environments [3]. They were analyzed by HPLC MS/MS and NMR to evaluate their total phenolic (TPC) and flavonoid (TFC) content. The extraction rate of PP-196 was the highest (38.86%), and the extraction rate of PP+4 was the lowest (34.95%). The maximum TPC, TFC, total antioxidants, reducing power and superoxide anion scavenging activity measured by PP-80 were 13.99 ± 0.03 mg GAE/g, 3.38 ± 0.01 mg GAE/g, 174.31 ± 1.60 µg/mL, 153.6 ± 0.06 µg/mL and 25.83 ± 0.55 µg/mL, respectively. The inhibitory activities of extracts against acetylcholinesterase, butyrylcholinesterase, alpha-glucosidase, lipase, and tyrosinase were found to be more effective than standard drugs. PP-196 exhibits potential antibacterial activity against gram-positive and gram-negative bacteria. The tested extracts found significant DNA protection capacities. Analysis of photochemical components by HPLC-MS/MS was performed that the extracts mainly contained rutin, morin, tamarind, kaempferol and chrysin, shikimic acid, caffeic acid, *p*-coumaric acid, and *o*-coumaric acid. 1H-NMR analysis of the phenolic region showed high signal intensities for galangin, chrysin, ramnocitrin, genkwanin, tectochrysin, and 3-methoxycamherol obtained from PP+4 and PP-80 extracts. The results proved that propolis cold pulverized (PP-80 and PP-196) and extracted in water could be a powerful natural dietary supplement, non-toxic, and effective for human health. |
| Keywords : Water-Based Turkish Propolis, Phenolics, Flavonoids, Bioactivity  **Acknowledgments:**This work has been supported by Ondokuz Mayıs University (BAP) under Project No: PYO.FEN.1901.20.001 |

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