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Bee pollen is among the most popular natural products used for various medical uses due to both its nutritional benefits, powerful therapeutic properties and many bioactive compounds. Today, bee pollen is consumed as a dietary supplement and for some alternative medical treatments, and has significant potential as a “fortification and survival food” [1]. In studies focusing on the bioactive compounds of bee pollen, more than 250 bioactive substances consisting of lipids, amino acids, proteins, carbohydrates, fatty acids, phenolic compounds, terpenes, carotenoids, flavonoids, vitamins and bio-elements have been identified [2]. It has been emphasized that these compounds are related to the antioxidant, antimicrobial, antidiabetic, anti-hyperglycemic, anti-inflammatory, hepatoprotective, nephroprotective and anti-cancer properties of bee pollen [1,3].

The aim of this study is to obtain pure compounds from sunflower (*Helianthus annuus*) bee pollen as bioassay-guided isolation. In the first step of the study, antioxidant (DPPH• scavenging, ABTS•+ scavenging, β-carotene linoleic acid, CUPRAC, and metal chelating assays), α-amylase and α-glucosidase inhibition activities of sunflower bee pollen, methanol and water extracts and fractions (hexane, dichloromethane, ethyl acetate, butanol and water) obtained from the methanol extract were screened. The ethyl acetate (IC₅₀: 79.97±0.89, 112.61±1.89 µg/mL) and butanol (IC₅₀: 84.38±0.92, 230.13±2.14 µg/mL) fractions were recorded as the highest antioxidant active in ABTS•+ and DPPH• scavenging assays. The hexane fraction (IC₅₀: 92.36±1.07 µg/mL) and methanol extract (IC₅₀: 80.32±0.92 µg/mL) indicated the highest antioxidant activity in β-carotene linoleic acid assay. The ethyl acetate (A_{0.50}: 80.03±0.36 µg/mL) and butanol (A_{0.50}: 79.16±0.58 µg/mL) fractions possessed higher antioxidant activity than α-tocopherol (A_{0.50}: 89.47±0.87 µg/mL) in CUPRAC assay. All fractions and methanol extract (80,13±2,39-90.43±1.22%) showed close metal chelating activity to EDTA (96.30±0.11%) at 800 µg/mL concentration. The hexane extract was found to be the best inhibitor on α-amylase (IC₅₀: 516.67±2.67 µg/mL) and α-glucosidase (IC₅₀: 346.86±2.13 µg/mL). In the second step of the study, the hexane fraction was subjected to silica gel column chromatography and a total of 16 sub-fractions were obtained. All sub-fractions were tested for antioxidant, α-amylase and α-glucosidase inhibition activities. Δ⁷-Avenasterol, a fatty acid and kaurenoic acid were isolated and their structures were confirmed based on spectroscopic analyses (IR, NMR and MS) and comparison with literature data.