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Phenolic acids, total phenolic contents, antioxidant activity and antiproliferative effect on MCF-7 cancer cell line of Sudanese honey samples

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The aim of the present study was to characterize the phenolic acids profile, total phenolic content, antioxidant properties and antiproliferative effect of five Sudanese honey samples (sunut sample (*Acacia nilotica*, subsp *nilotica*, family Mimosaceae), talih sample (*Acacia seyal* subsp *seyal*, family Mimosaceae), sidir sample (*Ziz phus spina-christi*, family Rhamnaceae), Sunflower sample (*Helinathus annuus*, family Asteraceae) and multi floral honey sample (Aldamazeen). Phenolic acids were analyzed using high-performance liquid chromatography (HPLC) equipped with diode array detector (DAD). Total phenolic contents were determined using Folin-Ciocalteu assay. The potential antioxidant activity was screened using DPPH assay. The cytotoxic effect of honey samples was carried out against MCF-7 breast cancer cell line using the MTT assay. A total of fourteen phenolic acids were analyzed and among all studied phenolic acids p-hydroxybenzoic acid, vanillic acid, and p-coumaric acid were detected in all honey samples. Talih honey was marked with the presence of gallic acid (702.20 µg/Kg honey) and multi-floral honey marked with the presence of syringic acid (732.09 µg/Kg honey). The sunut honey gave the higher total phenolic content with the value of 525.28 mg GAE /kg, while the lowest total phenolic content detected in multi-floral honey with the value of 144.33±1.52 mg GAE /kg. Talih and sunut samples recorded the highest antioxidant activity in this study with IC50 values of 1.33 and 3.11 mg mL⁻¹ respectively. The results of honey antiproliferative activity showed that sunut sample found to be the most potent cytotoxic honey among all the studied samples with an IC50 value of 3.88 mg mL⁻¹ followed by talih with an IC50 value of 5.29 mg mL⁻¹. Overall, our results indicate that the investigated Sudanese honey is rich in different types of phenolic acids and total phenolic contents. All honey samples showed antioxidant activity and exhibit a dose-dependent cytotoxic effect on the selected MCF-7 cancer cell line.

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