




Article

Antioxidant and Understanding the Anticancer Properties in Human Prostate and Breast Cancer Cell Lines of Chemically Characterized Methanol Extract from *Berberis hispanica* Boiss. & Reut

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Abstract: The current research was conducted to investigate the chemical profile, antiproliferative, and antioxidant activities of methanol extracts obtained by two different methods including maceration and Soxhlet from *Berberis hispanica* Boiss. & Reut. Antiproliferative activities were evaluated by the MTT (3-(4, 5-dimethylthiazolyl-2)-2, 5-diphenyltetrazolium bromide) assay in four human cancer cell lines including prostate (LnCap and 22 RV1) and breast cancer (MDA-MB-231 and MCF7). The antioxidant power was evaluated by DPPH ((2,2-diphenyl-1-picryl-hydrazyl-hydrate), ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid), and FRAPS (Ferric reducing antioxidant power) tests. The chemical composition was conducted by gas chromatography-mass spectrometry (GC-MS) after methylation. Total phenolic and flavonoid contents were assessed using the Folin-Ciocalteu method. The phytochemical analysis showed that the tested extracts possessed inserting potentially active compounds. The MTT test revealed that both extracts (maceration and Soxhlet) reduced cell viability in all cell lines tested. In breast cancer cell lines MDA-MB-231 and MCF-7, the IC₅₀ values obtained by maceration were 16.55 ± 0.58 and 17.95 ± 0.58 µg/mL, respectively. These values were slightly lower than those obtained with the Soxhlet extract toward MDA-MB-231 (19.93 ± 0.74 µg/mL) and MCF-7 (20.22 ± 0.89 µg/mL). Regarding prostate cancer cells 22 RV and LnCap, the IC₅₀ values obtained by maceration extract (22 RV: 11.75 ± 0.35 µg/mL; LnCap: 11.91 ± 0.54 µg/mL) were also slightly lower than those obtained with Soxhlet (22 RV: 13.47 ± 0.52 µg/mL; LnCap: 19.64 ± 1.05 µg/mL). The antioxidant activity showed that the studied extracts had considerable antioxidant activity (DPPH, FRAP, and ABTS) with particular attention to the extract obtained with maceration. The *Berberis hispanica* Boiss. and Reut. can serve society as it provides potentially bioactive compounds that may find application in the medical sector to control such diseases.

Keywords: *Berberis hispanica* Bois. and Reut.; antiproliferative activity; GS-MS; antioxidant activity; cancer cell lines