Hystrix Brachyura Bezoar Characterization, Antioxidant Activity Screening, and Anticancer Activity on Melanoma Cells (A375): A Preliminary Study

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Abstract

Porcupine bezoars (PBs) are masses of undigested calcareous concretions formed within the gastrointestinal tract. There are undocumented claims that PBs have antioxidant activity and can treat cancers. However, limited scientific study has been carried out to verify these traditional claims. Hence, this study was conducted to characterize the chemical profile and validate the antioxidant and anticancer activity against melanoma cells (A375). PB extract was initially subjected to Fourier-transform infrared spectroscopy (FTIR), gas chromatography-mass spectrometry (GCMS), total phenolic content (TPC), and total flavonoid content (TFC) analyses. The bioautography of antioxidant assays, namely 2,2-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid (ABTS), 2,2-diphenyl-1-picrylhydrazy (DPPH), and beta-carotene was performed. An in vitro A375 cell viability assay, apoptosis assay, cell cycle arrest assay, and gene expression assay were carried out as well. The experimental finding revealed 5,10-diethoxy-2,3,7,8-tetrahydro-1H,6H-dipyrrolo[1,2-a:1,2-d]pyrazine, ursodeoxycholic acid, and cholest-5-en-3-ol (3 beta)-, carbonochloridate are major compounds detected in PB extract. PB extract has low phenolic content, viz. 698.7 +/- 0.93 (mu g GAE/5 mg dry weight). The bioautography antioxidant assays revealed a potent antioxidant effect (ABTS > DPPH > beta-carotene), with free radical scavenging activity. Furthermore, PB extract exhibited dose- and time-dependent inhibition of cancer activity on A375 cells due to the exhibition of apoptosis via an intrinsic pathway.

Keywords

Author Keywords: porcupine bezoar; GCMS; antioxidant assay; apoptosis; traditional medicine

KeyWords Plus: ANTI-HYPERGLYCEMIC ACTIVITY; SCAVENGING ACTIVITIES; ASSISTED EXTRACTION; APOPTOSIS; COLLECTION; PORCUPINE; SOLVENTS; LEAVES; STONE

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