Phytochemicals, antioxidant properties and anticancer investigations of the different parts of several gingers species (Boesenbergia rotunda, Boesenbergia pulchella var attenuata and Boesenbergia armeniaca)

Abstract

Extracts (methanol) of the leaves, stem and rhizome of Boesenbergia species were studied for their phytochemical constituents, total phenolics and flavonoid contents, antioxidant as well as anticancer properties. The plants revealed the presence of polyphenols such as quercetin, kaempferol, rutin, naringin, hesperidin, caffeic acid, p-coumaric acid, ferulic acid, sinapic acid, chlorogenic acid, gallic acid, luteolin and diosmin by using High Performance Liquid Chromatographic (HPLC). It was indicated with significant composition of hesperidin and naringin in B. pulchella var attenuata (leaves and stem); quercetin and kaempferol in B. rotunda; luteolin in B. armeniaca. The results of antioxidant assessments conducted were similar to the trend of total phenolic and flavonoid contents: B. pulchella var attenuata> B. rotunda> B. armeniaca. In the cytotoxicity assay, B. rotunda showed the most prominent and promising result as anticancer medicinal plant. It showed positive antiproliferative effect against five cancer cell lines: ovarian (CaOV 3), breast (MDA-MB-231 and MCF-7), cervical (HeLa) and colon (HT-29) cancer cell lines with 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay conducted. In addition, the rhizome of B. pulchella var attenuata and B. armeniaca shown positive result in cytotoxicity assay tested against breast cancer (MCF-7). Thus, the Boesenbergia species investigated would be a promising anticancer remedy for breast cancer.

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