

# Anthocyanin-Rich Extracts of Calafate (*Berberis microphylla* G. Forst.) Fruits Decrease In Vitro Viability and Migration of Human Gastric and Gallbladder Cancer Cell Lines

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Currently, gastric cancer (GC) and gallbladder cancer (GBC) constitute important causes of human deaths related to cancer worldwide. In the last years, several researches are focused on the role of dietary compounds in preventing cancers. The consumption of fruits with high antioxidants, mainly anthocyanins, represents a good option to reduce the risk of chronic human diseases. Calafate (*Berberis microphylla* G. Forst.) berries, recognized by their remarkable antioxidant properties and high content of anthocyanins, appear as a new alternative to treat degenerative diseases of public interest. The present work was aimed to evaluate the impact of crude and anthocyanin-rich extracts from Calafate fruits on in vitro cell viability and migration capacity of gastric (AGC) and gallbladder (G415) human cancer cell lines, as related with their antioxidant properties. Crude and anthocyanin-rich extracts were obtained from fruits of Calafate grown under field conditions in the south of Chile. Antioxidants, phenols, anthocyanins, and anthocyanidins were determined. In vitro cell viability and migration of AGS and G415 human cancer cell lines at different concentrations of extracts (25?800 ?g mL?1) were determined. Anthocyanin-rich extracts of Calafate berries showed

comparable antioxidant activity (up to 1200 µg Trolox eq. g<sup>-1</sup>DW), slightly lower total phenolic content (12%), but higher total anthocyanin content (25%) compared to the crude extract. The major anthocyanidin molecule detected in both extracts was delphinidin, followed by malvidin, and low concentrations of petunidin, cyanidin, and peonidin. As expected, all of these compounds were detected in higher levels in anthocyanin-rich extracts (up to 2-fold). Noteworthy, our study revealed that Calafate fruit extracts strongly decrease in vitro viability and migration capacity of gastric carcinoma (AGC model) and gallbladder carcinoma (G415 model) human cell lines; however, the anthocyanin-rich extract displayed higher inhibitory effects (up to 70%) compared to crude extracts. These findings allow suggesting that the in vitro antiproliferative potential of Calafate fruit extract is strongly related to the anthocyanin concentration, especially delphinidin. © 2020, Sociedad Chilena de la Ciencia del Suelo.

Antioxidants

Antiproliferative effect

Calafate

Delphinidin

Gallbladder cancer

Gastric cancer