Chemoprotective Properties

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OBJECTIVES

- To determine and compare the chemopreventative effects of anthocyanin-rich extracts from different sources on colon cancer cells
- To evaluate synergistic, additive or antagonistic effect between anthocyanins with other phenols
- To determine the effects of chemical structural modification on the chemopreventive activity of anthocyanins

INTRODUCTION

Anthocyanins are a class of flavonoidal compounds responsible for the bright redness of many fruits, red, purple, and blue colors of most red fruits, and vegetables. Interest in anthocyanins has increased due to their color characteristic as well as the health benefits as value-added ingredients. Anthocyanins are the most abundant anthocyanin in the diet with a daily consumption of about 200 mg.9-11,17,18,19,20 High levels of anthocyanins are found in berries, plums, purple carrot, purple corn, red radish, red cabbage, and blueberries. These natural sources have been reported to possess anti-cancer properties and to have potential in cancer prevention treatments of fruits and vegetables which are responsible for their chemoprotective activities.11-13,15,19-21 Anthocyanins are considered to be one of the main factors in the reduction of colon cancer risk from recent studies.19,20,21 Anthocyanins have attracted great attention because they are very antioxidants and have a significant role in the prevention of cancer. However, the effectiveness of anthocyanins has been studied in different tests and studies.

There are several anthocyanin sources which are commonly found in nature. Each anthocyanin may be glycosylated and acylated by different aliphatic and aromatic acids. Although structurally distinct anthocyanins have been identified in nature, the detailed structure/functional relationship of anthocyanins is not clear. To understand the effects of anthocyanin structure on their biological activity is important for investigations to choose anthocyanins from rich sources with increased health benefits and also meaningfully for future functional food developments.

RESULTS

ANTHOCYANIN SOURCES

A. Anthocyanin-rich sources that contain only non-acylated anthocyanins

B. Anthocyanin-rich sources that contain non-acylated as well as acylated anthocyanins

CONCLUSIONS

All anthocyanin-rich extracts inhibited colon cancer cell proliferation at varying concentrations. The IC50 values were low enough to exert chemoprotective effects possibly in G0/G1. HT29 cell growth inhibition studies among all sources indicate that anthocyanins in ARES play an important role in inhibition of cancer cell proliferation. Non-acylated and acylated anthocyanins are more effective chemoprotective agents than their corresponding anthocyanins acylated with an aliphatic acid.