

Bromelain from pineapple stem (*Ananas comosus* L.), exerts chemopreventive action on colon carcinogenesis via anti-proliferative and pro-apoptotic effects

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Background and scope: Chemoprevention and cure in colorectal cancer are of vital importance. Here, we investigated the potential chemopreventive and curative effects of bromelain (from the pineapple stem of *Ananas comosus* L., family Bromeliaceae) in murine models of colon cancer. The possible mode of action was investigated in a human colorectal carcinoma cell line. **Methods:** The antitumoral effect of bromelain was evaluated using both the azoxymethane and the xenograft murine models of colon carcinogenesis. Proliferation and apoptosis were evaluated in colorectal carcinoma (Caco-2) cells by the ³H-thymidine incorporation assay and caspase 3/7 activity measurement, respectively. ERK and Akt expression were measured by western blot analysis, ROS production by a fluorimetric method. **Results:** *In vivo*, bromelain reduced the development of aberrant crypt foci, polyps and tumours induced by azoxymethane but not the growth of tumours induced by xenograft injection in nude mice. Bromelain reduced cell proliferation and promoted apoptosis in Caco-2 cells. The effect of bromelain was associated to down-regulation of pERK_{1/2}/total ERK and pAkt/Akt expression as well as to reduction of ROS production. **Conclusion:** Bromelain exerts chemopreventive actions in colon carcinogenesis *in vivo* and anti-proliferative/pro-apoptotic effects in colorectal carcinoma cells. Bromelain-containing foods and/or bromelain itself are promising candidates as chemopreventive agents for colorectal carcinogenesis.