

Quantitative determination of active Bowman-Birk isoinhibitors, IBB1 and IBBD2, in commercial soymilks

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Naturally-occurring serine protease inhibitors of the Bowman-Birk family are of growing interest due to their potential chemopreventive and/or therapeutic properties within the gastrointestinal tract [1]. Recent studies have demonstrated a significant concentration- and time-dependent decrease in the growth of HT29 human colon adenocarcinoma cells when treated with a mixture of soybean Bowman-Birk inhibitors (BBI) [2]; such effect seems to be related to their intrinsic ability to inhibit serine proteases [3]. In this study, we have determined, in six commercial soymilks, the amounts of total BBI and their major isoinhibitors, IBB1 and IBBD2, in their active form. IBB1 inhibits both trypsin- and chymotrypsin-like proteases whereas IBBD2 inhibits trypsin only; despite showing significant differences in their inhibitory properties, both exert anti-proliferative effects against colon cancer cells [2]. By using cation exchange chromatography, the BBI isoinhibitors were isolated and their specific trypsin inhibitory activity was used to estimate the amounts present in soymilks. IBB1 and IBBD2 concentrations ranged from 0.44 to 5.20 and 0.27 to 4.60 mg/100 ml of soymilk, respectively; total BBI, considered as the sum of both isoinhibitors, ranged from 0.59 to 9.18 mg/100 ml of soymilk. These data show that physiologically relevant amounts of active BBI are present in soymilk and may exert health-promoting effects. Further studies addressing the protective effect of BBI to digestion on other bioactive compounds present in soymilk, with particular emphasis on lunasin [4], are currently underway.

References:

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