
**Abstract**
Colon cancer is becoming increasingly common in Asian countries and still remains the second leading cause of cancer death in the United States. Ginger, a natural spice having both antioxidant and antimitogenic property, is known to inhibit chemical carcinogenesis. This study was designed to investigate the chemopreventive efficacy of ginger on the activity of bacterial enzymes in rats induced colon cancer by 1,2-dimethylhydrazine. Twenty milligrams per kilogram body weight of 1,2-dimethylhydrazine was administered subcutaneously once a week for the first 15 weeks and then discontinued. Ginger (50 mg/kg body weight/per day, oral) was given at the initiation and also at the postinitiation stages of carcinogenesis to 1,2-dimethylhydrazine-treated rats. The animals were killed at the end of 30 weeks. The macroscopic findings in the colon and the incidence of tumors were recorded in each group, and the activity of beta-glucuronidase and mucinase was estimated in the tissues and fecal contents of rats. After a total experimental period of 32 weeks (including 2 weeks of acclimatization), tumor incidence was 100% in 1,2-dimethylhydrazine-treated rats. The incidence of cancer as well as the number of tumors in the colon was significantly reduced both in the initiation and postinitiation stages of carcinogenesis on ginger administration. The activities of bacterial enzymes beta-glucuronidase (proximal colon, distal colon, intestines, liver and colon contents) and mucinase (colon and fecal contents) were significantly elevated in 1,2-dimethylhydrazine-treated rats as compared with the control rats. The increase in beta-glucuronidase activity may augment the hydrolysis of glucuronide conjugates, liberating the toxins, while the increase in the mucinase activity may enhance the hydrolysis of the protective mucins in the colon. Ginger administration to 1,2-dimethylhydrazine-treated rats significantly decreased the incidence and number of tumors as well as the activity of beta-glucuronidase and mucinase. Thus, ginger has a chemopreventive and anticarcinogenic effect against 1,2-dimethylhydrazine-induced colon cancer by virtue of its ability to lower the activities of the microbial enzymes beta-glucuronidase and mucinase.