Antitumor Effects of Zerumbone from Zingiber zerumbet in P-388D1 Cells in Vitro and in Vivo

王靜瓊
Huang GC;Chein TY;Chen LG;Wang CC

Abstract

he fresh rhizome of Zingiber zerumbet (L.) Roscoe ex Smith (Zingiberaceae) is widely used as a folk medicine in Taiwan. In this study, the fresh rhizome was extracted with 95 % EtOH and partitioned with diethyl ether. The antitumor effects of the diethyl ether extract were measured in cultured P-388D (1) cells and in an animal model of P-388D (1)-bearing CDF (1) mice. The results indicated that the extract could induce DNA fragmentation in P-388D (1) cells in vitro, and significantly prolong the life of P-388D (1)-bearing CDF (1) mice (ILS% = 127.8) at a dosage of 5 mg/kg body weight. After column chromatography combined with an MTT cytotoxicity bioassay, zerumbone, a cyclic sesquiterpene was isolated from the diethyl ether extract. Zerumbone inhibited the growth of P-388D (1) cells, induced DNA fragmentation in culture, and significantly prolonged the life of P-388D (1)-bearing CDF (1) mice (ILS% = 120.5) at a dosage of 2 mg/kg. Furthermore, zerumbone inhibited the growth of a human leukemia cell line, HL-60 cells, in a time- and concentration-dependent manner, with IC (50) values of 22.29, 9.12, and 2.27 microg/mL for 6, 12, and 18 h, respectively. The cell cycle of HL-60 cells was observed after treatment with zerumbone, which induced G (2)/M cell cycle arrest in HL-60 cells in a time- and concentration-dependent manner, and decreased the cyclin B1/cdk 1 protein level. These results suggest that zerumbone is an active principal of Z. zerumbet and is potentially a lead compound for the development of anticancer drugs.