Antioxidant potential and anticancer activity of young ginger (Zingiber officinale Roscoe) grown under different CO2 concentration.

Abstract

In the present study, leaves and rhizomes extract from two Malaysian young ginger (Zingiber officinale Roscoe) varieties namely: Halia Bentong and Halia Bara grown under ambient (400µ mol/mol) and elevated (800µ mol/mol) CO2 concentrations were studied for their antioxidant and in vitro anticancer activities against two human cancer cell lines (MCF-7 and MDA-MB-231). Antioxidant activities in both varieties determined using thiobarbituric acid (TBA) assays increased significantly with increasing CO2 concentration from 400 to 800µ mol/mol. High antioxidant activity was observed in the rhizomes of Halia Bara grown under elevated CO2 concentration. The results showed that CO2 enriched Halia Bara exhibited the highest anticancer activity on MCF-7 cancer cells with IC50 values of 25.3 and 27.31 µg/ml respectively for rhizomes and leaves extract. IC50 values for MDA-MB-231 exhibition were 30 and 32.81 µg/ml respectively for rhizomes extract of Halia Bara and Halia Bentong. Results showed that Halia Bentong and Halia Bara possessed anticancer and antiradical properties especially when grown under elevated CO2 concentration. Antioxidant activities of ginger leaves and rhizomes could be increased or improved by using CO2 enrichment in a controlled environment condition. Results also implied that these ginger varieties could be employed in ethno-medicine for the management of cancerous diseases.

Keyword: Thiobarbituric acid assays; CO2 enrichment; Halia Bentong; Halia Bara; Breast cancer cell; MCF-7; MDA-MB-231.