Effects of various drying processes on Malaysian brown seaweed, Sargassum polycystum pertaining to antioxidants content and activity

ABSTRACT

The objective of this study was to evaluate the effects of different drying methods on phytochemicals and in vitro antioxidant activity of brown seaweed, Sargassum polycystum. Six different drying methods employed in this study were freeze drying, oven drying at 40 °C, oven drying at 60 °C, sun drying, vacuum drying at 40 °C and vacuum drying at 60 °C. Five different polarity solvents, methanol, ethanol, acetone, ethyl acetate, cold water and hot water were used as extraction solvents to determine phytochemicals content for total phenolic content, total flavonoid content and total carotenoid content while that antioxidant activity was assessed by employing ferric reducing antioxidant power (FRAP), 2,2- diphenyl-1-picrylhydrazyl radical scavenging activity (DPPH) and beta carotene bleaching (BCB) assay. Ethyl acetate extracts vacuum dried at 40 °C showed highest total phenolic content (58.54 ± 1.30 mg PGE g-1 dry extract), total flavonoid content (35.91 ± 1.54 mg RE g-1 dry extract), FRAP value 379.41 ± 1.17 µmol TE g-1 dry extract and DPPH EC50 values, 3.83 ± 0.18 mg mL-1 among all drying methods. Sun dried extracts possessed lowest retention of phytochemicals content and antioxidant activity among other drying methods. As a conclusion, S. polycystum was best dried by vacuum drying method at 40 °C which has the higher retention of phytochemicals and antioxidant content.