Volatile compound extraction using Solid phase micro extraction coupled with gas chromatography mass spectrometry (SPME-GCMS) in local seaweeds of Kappaphycus alvarezii, Caulerpa lentillifera and Sargassum polycystem

Abstract

A pioneer study with a new extraction method was applied to the volatile compounds of three local seaweeds from Borneo, Caulerpa lentillifera, Kappaphycus alvarezii and Sagassum polycystum using HS-SPME method. Dynamic headspace was optimized according to an experimental design, with appropriate temperature of 50°C and 60°C and extraction time as 20 min, 30 min, 40 min and 50 min by using PDMS and PDMS-DVB. Significantly, PDMS fibre extracted more compounds than PDMS-DVB. Thus PDMS is recommended as a better fibre comparatively to PDMS-DVB in volatile compounds extraction using SPME for these particular seaweeds. Qualitative study portray a total of 223 volatile constituents successfully extracted and identified with 82, 91 and 50 volatiles from each species of K. alvarezii, C. lentillifera and S. polycystum respectively. The volatile compounds are comprised of nine chemical compounds of hydrocarbons, aldehydes, ketones, esters, alcohols, halogenated compounds, acid compounds, aromatic compounds and some miscellaneous compounds. Comparison on the major volatile constituents among the seaweeds shows a similar percentage of volatile compounds in all seaweeds among the nine groups. Within them, hydrocarbon compounds were the most characteristic of all three algae, and more particularly, all three seaweeds mostly share the common constituents in their structures.