Antibacterial activity of fine chemicals from Scenedesmus acuminatus (Scenedesmaceae, Chlorococcales, Chlorophyta)

Abstract

Microalgae, Scenedesmus acuminatus was batch-cultured in a photo-bioreactor to facilitate better culture control and higher productivity. Each batch was cultured for 100 hours; final cell density and specific growth rate were 5.0×10^7 cell/ml and 0.028 $hour^{-1}$, respectively. The harvested biomass produced 70.80 mg crude extract with antibacterial activities. Bioassay guided separation and spectroscopy data revealed a mixture of fatty acid methyl esters (FAME) (C16:0, C16:1, C18:1n9c, C18:2n6c and C20:0) as the active principal. Further antibacterial bioassay with commercially available individual FAME revealed C18:1n9c methyl ester and C18:2n6c methyl ester, as the active compounds in the mixture. The active methyl esters, C18:1n9c and C18:2n6c, inhibited 48% (MIC: 0.3 $\mu g disc^{-1}$) and 100% (MIC: 0.3 and 1.0 $\mu g disc^{-1}$) of tested bacteria, respectively.