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Extraction and analysis of fatty acids from Cyanobacteria using GC x GC-TOFMS

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Cyanobacteria grow in freshwater bodies when they are provided with suitable growth conditions such as nutrients, temperature and light. Algae biomass is known to contain a large amount of lipids such as saturated and unsaturated fatty acids. In this study fatty acids from algal cells were extracted using a newly developed extraction protocol using ionic liquid enhanced by direct transesterification at an elevated temperature. The identification and quantification of fatty acids was performed using gas chromatography coupled to a time-of-flight mass spectrometer (GCxGC-TOFMS). The extracted fatty acids were dominated by those with carbon chain of C16 and C18; [ie. 7-hexadecenoic acid (C16:1) and hexadecanoic acid (C16:0) for C16, whereas C18 includes γ -linolenic acid (γ -C18:3); linoleic acid (C18:2); linolenic acid (C18:3); 6,9,12,15-octadecatetraenoic acid (C18:4); oleic acid (C18:1) and octadecanoic acid (C18:0)]. The obtained fatty acids composition was then compared with that obtained by organic solvent extraction using a mixture of chloroform and methanol. Statistical evaluation was performed using one-way ANOVA and found that there was no statistically significant difference ($P = 0.908$) between the two extraction methods, a finding which indicates the usefulness of ionic liquid as a solvent to replace volatile organic solvent to minimize environmental pollution.

Biography

Titus AM Msagati has completed his PhD in 2005 from the University of Botswana and a short postdoctoral studies from Lund University in Sweden. He is currently working at the University of Johannesburg, in South Africa as an associate professor of chemistry (Department of Applied Chemistry). He has published more than 50 papers in reputed journals.

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