Characterisation of lipids from cultivable filamentous fungi isolated from Antarctic soils

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Antarctic soil represents an important reservoir of filamentous fungi (FF) species with capability to produce novel bioactive lipids. Saturated and unsaturated fatty acids (FA) of FF isolated from extreme environments have an important role in regulating biotic and abiotic stresses and could be used as important ingredients in different biotechnological solutions (Rosa et al., 2019). However, the lipid extraction method is a bottleneck (Langseter et al., 2017). Currently, Folch, Bligh & Dyer and Lewis methods are the most widely employed for lipid extraction from different sources. The objective of the present work was to isolate and identify cultivable FF from Antarctic soils, to assess the most effective methods for FA extraction, and to characterise the lipids obtained. Eighteen FF strains were isolated from Antarctic soil and used for lipid production. Fungi strains belonging to the genera *Botrytis* (n= 2), *Cladosporium* (n= 3), *Cylindrobasidium* (n= 1), *Mortierella* (n= 4), *Penicillium* (n= 2), *Pseudogymnoascus* (n= 4), *Talaromyces* (n= 1), and to the Melanommataceae family (n= 1) were identified. The Folch, Bligh & Dyer, and Lewis extraction methods were assessed and methyl esters of FA (FAME) were obtained. The Lewis method was the best one in recovering FAME from fungal biomass. Although Bligh & Dyer and Folch methods were useful for FA extraction, both methods were less efficient in recovering FAME. Overall, 17 FA were identified in all samples obtained from all extractions. Oleic and linoleic acids, followed by stearic and palmitic acids, were predominant for all fungal strains in the three methods assessed. In the present study, in addition to fungi species well known for their oil-producing potential (e.g., *Mortierella* spp.), other fungi species that have just little been explored for lipid production in the past,

such as *Cylindrobasidium eucalypti*, *Penicillium miczynskii*, *P. virgatum*, and *Pseudogymnoascus pannorum* were observed as FA sources promising alternatives.

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- Maximum three references.

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