

Evaluation of lipid extraction methods from Antarctic filamentous fungi

P68

Gallardo V.^{1,2}, Sepúlveda M.^{1,2}, Barría E.², Cayún Y.², Dias N.³, Lima N.^{4,5}, Cornejo P.⁶, Santos C.²

¹Doctorado en Ciencias de Recursos Naturales, Universidad de La Frontera, 4811-230, ²Departamento de Ciencias Químicas y Recursos Naturales, Universidad de La Frontera, 4811-230 Temuco, Chile, ³Núcleo Científico Tecnológico en Biorecursos (BIOREN-UFRO), Universidad de La Frontera, 4811-230 Temuco, Chile, ⁴CEB-Centre of Biological Engineering, Micoteca da Universidade do Minho (MUM), University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal, ⁵LABELLS (Associate Laboratory, Braga/Guimarães), University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal, ⁶Escuela de Agronomía, Facultad de Ciencias Agronómicas y de los Alimentos, Pontificia Universidad Católica de Valparaíso, Quillota, Chile

Purpose: The benefits of natural compounds have been studied for decades for the development of new technologies to answer the global change challenges. In order to develop these new technologies, lipids represent a great class of bioactive molecules. However, the research on lipids and their applications still present gaps about new sources as well as on the extraction methods. Filamentous fungi found in Antarctic territory could represent a new source of novel bioactive lipids. Currently Folch, Bligh & Dyer and Lewis methods are the most widely employed for extraction of lipid from different sample types. Nonetheless, choosing a single extraction method as the gold standard could represent a limitation, especially when the microorganism has not been studied yet. Taking the above into consideration, the main objective of the present study was to evaluate the best extraction method to obtain lipids from different Antarctic filamentous fungal genera.

Material and methods: Three isolates of Antarctic fungi belonging to each genus: *Mucor*, *Mortierella*, *Cladosporium*, *Penicillium* and *Pseudogymnoascus* isolates from Fildes Bay, Antarctica, were evaluated. A total of 15 isolates were assessed. Folch, Bligh & Dyer and Lewis extraction method were performed. Extraction was monitored by recording spectra of FT-IR spectroscopy of the biomass before and after lipid extraction.

Results: Folch was the best method to obtain lipids from filamentous Antarctic fungi, followed by Lewis extraction. Among the three extraction methods evaluated, Bligh & Dyer was the method that presented the lowest yield, compared to Folch and Lewis for each genus and strain. Strains of the genera *Mortierella* and *Mucor* were the ones that showed the best performance for the Folch and Lewis methods. The three *Penicillium* isolates were the third group with the best lipids' yield for the Folch method. The strains of genera *Cladosporium* and *Pseudogymnoascus* showed better yields for the Lewis method.

Conclusions: In this study it was observed that the lipids' yield varies according to the extraction methods, as well as both the fungal isolate and fungal genus. Depending on the purpose and fungi taxa, to obtain lipids from Antarctic fungi Folch or Lewis extraction methods are recommended.