Title: ISOLATION OF COLD-ADAPTED FUNGI FROM TERRESTRIAL AND MARINE ANTARCTIC ENVIRONMENTS

Authors Wentzel, L.C.P. [1] , Inforsato, F.J. [1] , Sette, L.D. [1]

Institution [1]Departamento de Bioquímica e Microbiologia, Instituto de Biociências, Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP).

Abstract:

The study of extreme environments, such as the Antarctic, is a potential source for the discovery of new microorganisms and new natural products, since little is known yet about the diversity and the genetic resources present in these sites. Previous studies related to microbial prospecting of antarctic fungi have been demonstrating that these organisms represent a potential niche for the discovery of new enzymes, which can present properties of interest in several important social-economic sectors. In this context, the aim of this work was to isolate filamentous fungi and yeasts from soil and rhizosphere soil of *Colobanthus quitensis* and *Deschampsia antarctica* and from marine sediments. A total of 11 samples collected in the region of the Admiralty Bay (South Shetlands) in January 2015 (OPERANTAR XXXIII) were used (2 soils, 4 rhizosphere soils and 5 marine sediments). Before plating, samples were enriched under shaking conditions during one week in minimal medium in order to improve the isolation of fungi able to produce ligninolytic enzymes (for soil samples) and proteases and lipases (for marine sediment samples). The assays were incubated in two different temperatures, 5˚C and 15˚C with the addition of 0.2% of rice straw and sugarcane bagasse (soil samples), and 1% of olive oil and Tween 80 and 2% skim milk (marine sediment samples), each one used separatedly. After the enrichment, 200 µL of each sample were spread onto agar plates. For all soil samples, 3 different media were used, B&K plus guaiacol, MA 2% and MA 10x diluted. For sediment samples, PDA, PDA diluted 10x, adapted marine agar and BSA media were used. Plates were incubated under the two temperatures mentioned above for up to 2 months. A total of 1117 isolates were obtained, being 159 from soil, 787 from rhizosphere soil and 171 from marine sediments; 70% of the fungi were retrieved at 15ºC and 30% at 5ºC. Based on these results it is possible to infer that the majority of the isolates are psychrotrophic, and present a better and faster growth at 15ºC. The enrichment step favoured the growth of yeasts, mostly for sediment and soil isolates. Rhizosphere soil samples showed a considerable number of filamentous fungi and a total of 32 isolates from these samples showed potential for laccase production. The fungal collection obtained will be submitted to the evaluation of production of cold-adapted enzymes and the best producers will be characterized taxonomically.

Key words: Antarctica, cold-adapted fungi, laccase.

Financial agencies: CNPq, FAPESP and CAPES