Identification of fungi present in biofilm of Kroner Lake, Deception Island, Antarctica

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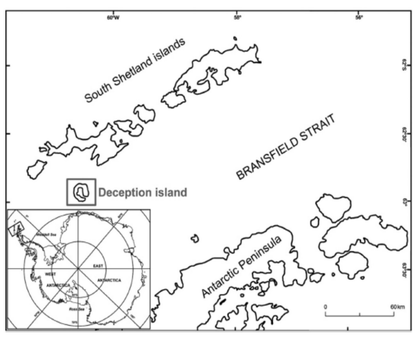
INTRODUCTION

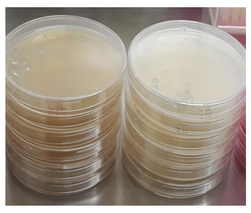
With exceptionally cold and dry environments, low availability of nutrients and long periods of darkness, Antarctica is dominated by microorganisms, whether cosmopolitan or endemic (Brasil, 2006; Gonçalves et al. 2012). In the Antarctic environment, lakes represent untapped habitats that can be used to study microbial diversity and ecology in extreme conditions. The present study evaluated the diversity of the fungal community present in biofilm sampled at Kroner Lake, Deception Island, Antarctica.

MATERIALS AND METHODS

The biofilm was collected in 15 points of the lake and the samples processed in different culture media.



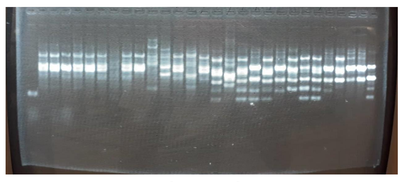
Fungal Isolation



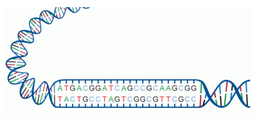
Sabouraud dextrose agar, marine agar
10 ºC - 60 days

Macromorphological grouping

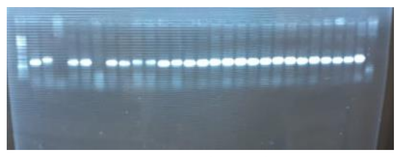
Fungal Identification



$(GTG)_5$



Sequencing



ITS and D1/D2

RESULTS AND DISCUSSION

From the biofilme we isolated 44 filamentous fungi and 22 yeasts that were identified using polyphasic taxonomy techniques (molecular biology, morphological and physiological techniques). Of these, 50 were identified as belonging to the genera *Metschnikowia*, *Antarctomyces*, *Pseudogymnoascus*, *Mortierella*, *Tricellula*, *Leucosporidium*, *Holtermanniella*, *Vishniacozyma*, *Arthroderma*, *Rhodotorula* and *Debaryomyces*.

Table 1. Fungi isolated from biofilm sampled at Kroner Lake and identified by sequence comparison using BLASTn match and the NCBI GenBank database

UFMGCB strain code	Top BLAST search (GenBank acc. n°)	N° of isolates	ID (%)	QC (%)	N° of bp analyzed	Proposed taxa
17059	*Pseudogymnoascus verrucosus* (KJ755525)	23	100	100	457	*Pseudogymnoascus verrucosus*
17047	*Antarctomyces psychrotrophicus* (NR164292)	8	100	100	444	*Antarctomyces psychrotrophicus*
17041	*Mortierella alpina* (MH859872)	4	100	100	513	*Mortierella alpina*
17048	*Mortierella elongatula* (NR111582)	1	96	100	428	*Mortierella* sp.
LB2	*Holtermanniella wattica* (NG058307)	1	100	100	514	*Holtermanniella wattica*
LB6	*Metschnikowia australis* (KY108453)	5	100	100	374	*Metschnikowia australis*
LB1	*Leucosporidium fragarium* (NG058330)	3	99	100	569	*Leucosporidium fragarium*
LB5	*Vishniacozyma victoriae* (NG057678)	1	100	100	569	*Vishniacozyma victoriae*
LB20	*Tricellula curvata* (MH868922)	1	99	100	396	*Tricellula curvata*
17052	*Arthroderma curreyi* (MH858822)	1	87	100	505	*Arthroderma* sp.
LB15	*Rhodotorula mucilaginosa* (KY109056)	1	100	100	552	*Rhodotorula mucilaginosa*
LB7	*Debaryomyces hansenii* (MK394104)	1	100	100	457	*Debaryomyces* sp.

CONCLUSIONS

Our results indicate that all species found in the biofilm, endemic or cosmopolitan, are of great importance in Antarctica, since they perform the primary decomposition of organic materials. Subsequently, all isolated fungi will be tested for their ability to produce various enzymes.

ACKNOWLEDGEMENTS

MYCOANTAR Diversidade e Bioprospecção de Fungos da Antártica
INCT da CRIOSFERA
PROANTAR
CNPq Conselho Nacional de Desenvolvimento Científico e Tecnológico
CAPES
FNDCT Fundo Nacional de Desenvolvimento Científico e Tecnológico
FAPEMIG

References

Brasil (2006) Coleção explorando o ensino - Antártica
Gonçalves et al (2012) Diversity and distribution of fungal communities in lakes of Antarctica. FEMS microbiology ecology, v. 82, n. 2, p. 459-471