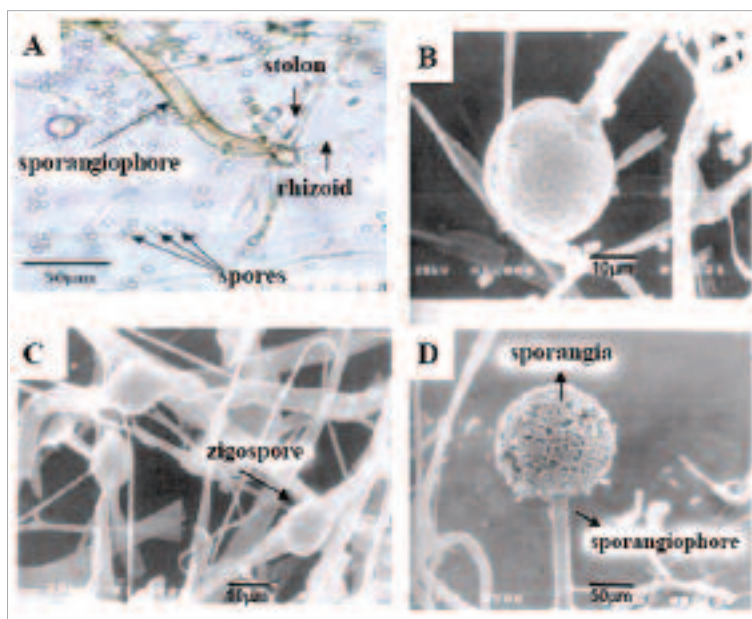


BIOPROSPECTION IN FUNGI: THE SEARCH OF LEAD COMPOUNDS FOR DRUG DESIGN AND ENZYMES FOR PHARMACEUTICAL AND INDUSTRIAL APPLICATIONS

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Fungi have been less explored than plants in bioprospecting programs, especially the endophytes, which remain a promising and practically unexplored source of interesting bioactive natural products. One of the major advantages of working with microorganisms in a natural products discovery program, is the possibility to screen a vast number of cultures on a small scale, before identifying the microorganisms, while retaining a high probability of success in reproducing both the activity and the metabolite production on a large-scale fermentation. Another advantage is that manipulations, in culture conditions, may lead to a wider range of compounds produced by fungi than it would be available from traditional production of extracts from plants. In this project we propose to exploit the chemical and biological potential of endophytic and soil fungi collected in São Paulo State in three approaches: i) obtainment of crude extracts from microbial cultures to be evaluated in antimicrobial assays performed in our labs and other bioassays of the network, and subsequent fractioning of most promising extracts aiming to obtain new leads for drug development;



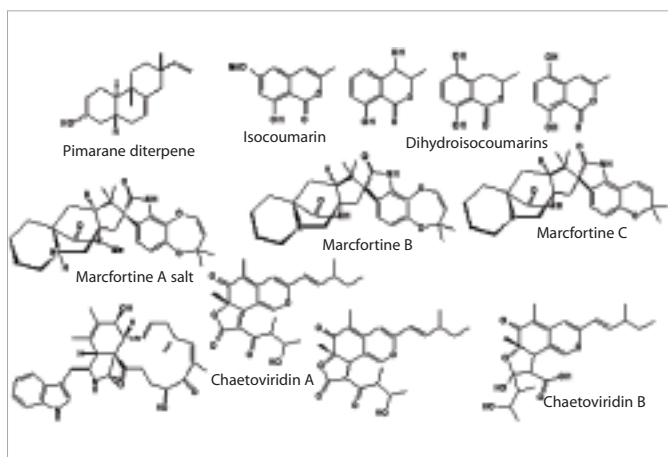
Rhizopus microsporus var. *rhizopodiformis*.
A- Photonic microscopy; B, C and D- Microscopy electron scanning

ii) obtainment of products from biotransformation reactions of bioactive natural products previously isolated in our labs (grandisin, budlein A and tagitinin C) and evaluation of their biological activities in bioassays of the network, and iii) production of enzymes, which might be useful for industrial processes (xylanase, glucose oxidase, phytase, amylase, acid and alkaline phosphatases) and as new pharmaceuticals (L-asparaginase). The proposed antimicrobial screening, as the first one, may be an indication of a wider range of bioactivity.

SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The collection of soil and plant samples were undertaken for the isolation and identification of fungi strains, many of which were identified either by the staff of the Federal University of Pernambuco or by molecular biology (rDNA sequence). The group has selected fungi with potential for the production of enzymes of interest, such as L- asparaginase, xylanases, pectinases and others. From soil and endophytic fungi, it was isolated more than 30 secondary metabolites. The biotransformation of grandisin and budlein was also successful. The obtained results demonstrated the potential of the isolated fungi for the production of enzymes and secondary metabolites bearing the desired biological activities.

Chemical structures of isolated
compounds from studied fungi



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