

## BIOSYNTHESIS OF ANTIMICROBIAL SUBSTANCES BY IMMOBILIZATION OF THE LIQUENIZED FUNGUS CLADONIA SUBSTELLATA

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### ABSTRACT

The ability produce substances with antibiotic properties has been attributed several species of lichenized fungi. However, use of these substances is limited because lichenized fungi grow very slowly, making it difficult to obtain sufficient amount of substances for chemical and biological tests. The present study had as objective biosynthesize antimicrobial substances from *Cladonia substellata* in immobilized system, without destruction of biomass it in nature. Fragments of the lichen thallus this species were immobilized in 5 g of kaolinite, using 10 mM sodium acetate as metabolic precursor. Metabolic products obtained were submitted spectrophotometric and chromatographic analysis, which revealed the production of substances by immobilized lichen, similar to substances produced by lichen *in natura*. These products were submitted disc diffusion antimicrobial tests to evaluate the inhibitory potential against pathogenic microorganisms. Microbial suspensions were inoculated into Petri dishes containing Mueller-Hinton agar and Sabouraud agar as culture medium for bacteria and fungi, respectively. The paper discs were impregnated with products obtained, at concentration of 2mg / mL, and deposited on previously inoculated medium. The petri dishes were incubated at 36°C and the results were evaluated formation and size of the inhibition zone around of discs. The results showed presence of antibiotic substances in extracts of *Cladonia substellata* obtained by immobilization, once they inhibited the growth of Gram positive, Gram negative, alcohol-acid resistant bacteria and filamentous fungi. It was showed that is possible the biosynthesis antimicrobial substances in laboratory, from the immobilization of fragments of the thallus of *Cladonia substellata*, avoiding the destruction of the biomass of this species in nature.

**Keywords:** Lichen immobilization, Agar diffusion test, *Cladonia substellata*

**Development Agency:** FAPESPA