INVESTIGATING ANTI-ASPERGILLUS ACTIVITY IN EXTRACTS FROM MARINE ACTINOBACTERIA

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Introduction

The genus *Aspergillus* with more than 300 species includes several opportunistic pathogenic fungi (*Aspergillus fumigatus*), toxin-producing fungi (*Aspergillus flavus*) and species used in the food industry (*Aspergillus niger*). *Aspergillus* species produce small spores called conidia with an average size of 2-3.5 µm, easily dispersed into the air, where they can remain for long periods of time, ending up being inhaled by humans and other animals, causing aspergillosis.

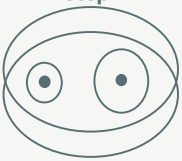
Aim

In this work, our aim was to evaluate the antifungal activities of marine actinobacterial extracts (n=30) against *Aspergillus* species. The actinobacteria were isolated from marine macroalgae and deep-sea samples.

The tested molds are *Aspergillus flavus* ATCC 204304, *Aspergillus fumigatus* ATCC 204305 and *Aspergillus brasiliensis* ATCC 16404.

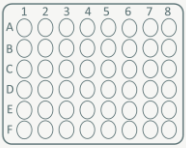
Methodology

Step 1



Disk diffusion method (DD) for all extracts and three species

Step 2



Minimum inhibitory concentration (MIC) and Minimum fungicide concentration (MFC) were determined for the best results for the extracts in the step 1

Step 3

Impact of extracts in conidia germination were evaluated for the best results in the step 2

Results

Table 1 – Results for DD method and MIC/MFC for *A. brasiliensis*

Specie	Extract	DD mean (mm)	CMI (µg/mL)	CMF (µg/mL)
A. brasiliensis	M10	17.2	>250	>250
	J5.2	15.8	>250	>250
	M14	9.3	15.62	>15.62
	I4.2	9.7	<15.62	15.62

The MIC and MFC were not determined for *A. fumigatus* since in step 1 of the DD determination no significant results were obtained. For *A. flavus*, the MIC and MFC of three extracts were determined, with results >250 µg/mL. For *A. brasiliensis* four extracts were tested, M14 and I4.2 stand out with a low MIC and MFC values. These two extracts were selected to evaluate their impact on spore germination at the concentrations, ½ MIC, MIC and 2*MIC, but did not show any impact on conidia germination.

Conclusions

- Some (4 in 30) of the tested actinobacterial extracts exhibited efficacy against *A. brasiliensis;*
- *A. fumigatus* and *A. flavus* were less susceptible to the tested extracts than *A. brasiliensis*;
- The two best extracts against *A. brasiliensis* are from actinobacteria isolated from deep-sea sponge (I4.2) and a macroalgae (M14);
- Neither of the two extracts tested against *A. brasiliensis* had an impact on conidial germination.

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