
Inhibition of Growth of *Aspergillus Flavus* and Aflatoxin Production by *Pseudomonas* Sp. Strain 4B

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Resumo

Genus *Aspergillus* produce aflatoxin B1 (AFB1), the most toxic naturally occurring fungal compounds, which represents a significant health hazard for humans and animals. The reduction or elimination of AFB1 is quite difficult, so methods that inhibit fungal growth, including the use of biological agents may be promising. This study was performed in order to investigate the ability of *Pseudomonas* sp. 4B to inhibit the growth and AFB1 production of *Aspergillus flavus*. *Pseudomonas* sp. 4B was isolated from the effluent pond of a bovine abattoir located at southern Brazil. This bacteria strain was obtained from the collection center at Laboratory of Applied Biochemistry and Microbiology (ICTA/ UFRGS, Brazil) and AFB1 producer *A. flavus* from Laboratory of Food Toxicology (ICTA/ UFRGS, Brazil). Bacterial strain cultured in tryptone soy broth (TSB) for 48 h at 37°C was added sterile molten potato dextrose agar (PDA), and a spore suspension was placed in the centre of each plates and incubated at 25 °C for 10 days. The fungal colonies diameter was measured and compared with control culture. Percentage colony inhibition was calculated according to the formula: Percentage growth inhibition = $[(Dc-Dt)/Dc] \times 100$, where DC is the average diameter of fungal colony with control, and DT the average diameter of fungal colony with treatment. The influence of bacterial strain on AFB1 production was carried out by growing both in Yeast Extract Sucrose broth (YES) at 25 °C for 10 days, without shaking.

Referência:

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AFB1 was extracted with chloroform and determined by thin layer chromatography (TLC). *Pseudomonas* sp. 4B has reduced fungal growth (53.8 - 69%), with colony diameters ranging between 21 and 34 mm. Furthermore, the lowest concentration of aflatoxin synthesis was 42.3 ng/ml. *A. flavus* without bacteria was able to produce great AFB1 at level of 1472ng/ml. These data can be considered satisfactory since mycotoxins can be produced in response to a stress factor, growth reduction caused by the presence of bacterial or yeast strains can stimulate mycotoxin production. The present study suggests that *Pseudomonas* sp. 4B could be an alternative method of controlling mycotoxigenic fungi and toxin contamination.

Palavras-Chave: Aflatoxin B1, Antifungal, Biological Control, Mycotoxins, *Pseudomonas*

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