

POTENTIAL OF CHITOSAN FROM *Mucor circinelloides* AS ALTERNATIVE NATURAL COMPOUND TO INHIBIT *Aspergillus*

S. R. CABRAL DE ALCÂNTARA^a; T. C. MONTENEGRO STAMFORD^{a,b,c}; A. KIOHARU NISHIDA^a; N. PEREIRA STAMFORD^d; L. DE OLIVEIRA FRANCO^d; M. C. DA SILVA^c; G. M. CAMPOS-TAKAKI^{c,e}

^aUniversity Federal of Paraíba, Cidade Universitária, João Pessoa-PB, Brazil CEP: 58059-900 E-mail: thayza.stamford@pq.cnpq.br; ^bNucleus of Health Research, Integrated College of Patos-PB, Brazil; ^cNucleus of Environmental Science, University Catholic of Pernambuco, Brazil. ^dUniversity Federal Rural of Pernambuco, Brazil; ^eUniversity Catholic of Pernambuco, Brazil;

The presence and growth of fungi in food may cause spoilage and result in a reduction in quality and quantity. Some *Aspergillus* species are responsible for many cases of food and feed contamination. Mold fungi growth is commonly controlled using synthetic antimicrobials, however, natural antimicrobials have also demonstrated important antifungal properties[1]. Chitosan is a natural, biodegradable, polycationic amino polysaccharide, and is a common constituent of fungal cell walls.. Antifungal activity is one of the most important bioactivities of chitosan, and earlier studies have reported that chitosan can reduce the growth of phytopathogenic fungi [2]. This study was to investigate the antifungal activity, in vitro, of chitosan, from *Mucor circinelloides* UCP 050, against five pathogens *Aspergillus* species,

Suspension of 10⁸ sporangioles/mL of *M. circinelloides* was inoculated in yam bean media and incubated at 28°C, 150 rpm, during 96 hours. The mycelia were harvested, washed in deionized water and submitted to lyophilization process. The process of extraction of chitosan involved deproteination with sodium hydroxide solution, separation of alkali-insoluble fraction, extraction of chitosan by Acetic acid. The degree of deacetylation for chitosan was determined by infrared spectroscopy, the molecular weights was determined by viscosity. Antimicrobial activity of chitosan against *Aspergillus ochraceus*, *Aspergillus fumigates*, *Aspergillus parasiticus*, *Aspergillus flavus* and *Aspergillus niger*, isolated from horticultural commodities, was determined by Helman test .

In the present study chitosan from *M.circinelloides* showed degree of deacetylation and viscosimetric molecular weight up to 85% DD (Fig.1) and 2.72 x 10⁴ g/mol, respectively. Chitosan showed a lower minimum inhibitory concentration against *A. fumigates*, *A. ochraceus* and *A. parasiticus* than *A. flavus* and *A. niger*, which was 2.5mg/mL and 5.0mg/mL, respectively, and identical minimum fungicide concentration for all *Aspergillus* assayed (5.0 mg/mL), table 1.

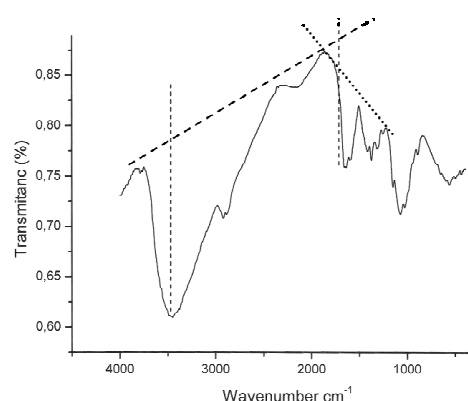


Figure 1. Infrared spectra of chitosan from *Mucor circinelloides* UCP 050. Degree of acetylation (DD) was determined according to Roberts (1992)

Table 1. Antimicrobial activity of fungic chitosan solution on acetic acid 1% against *Aspergillus* species.

Fungi sample	Minimum inhibitory	Minimum fungicidal
	concentration (MIC)	concentration (MFC)
<i>A. ochraceus</i>	2.5 mg/mL	5.0 mg/mL
<i>A. niger</i>	5.0 mg/mL	5.0 mg/mL
<i>A. flavus</i>	5.0 mg/mL	5.0 mg/mL
<i>A. parasiticus</i>	2.5 mg/mL	5.0 mg/mL
<i>A. fumigatus</i>	2.5 mg/mL	5.0 mg/mL

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REFERENCES

- Bautista-Baños S, Hernandez-Lauzardo NA, Velázquez-Delo-Valle G, Hernandez-Lopez M, Barka EA, Bosquez-Molina E, Wilson CL. *Crop Protection* **25**:108 (2006).
- Stamford TCM, Stamford TLM, Stamford NP, Neto BB, Campos-Takaki GM. *Electronic Journal of Biotechnology* **10**(1) (2007)