In vitro antifungal activity of *Boesenbergia rotundo* Linn. and *Syzygium aromaticum* L. Merr. & Perry. extracts against *Aspergillus flavus*

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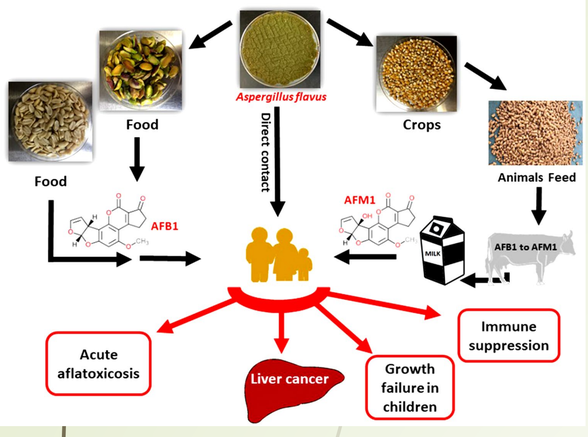
Introduction



Aspergillus flavus can multiply rapidly in conditions where mycelia can reach substrates from numerous different carbon sources. Aflatoxin, which has already been associated to level course I liver cancer, is also produced by the fungus [1].

B. rotunda

S. aromaticum

B. rotunda and *S. aromaticum* are widely distributed in the tropical area. These plant extracts have also been reported in traditional uses for the antimicrobial activity of various extracts and essential oils against gram-positive and negative bacteria, filamentous fungi, and *Candida* species [2-3].

The aims of the study were to investigate the antifungal activity of *B. rotunda* rhizomes and *S. aromaticum* flower buds obtained by dichloromethane and ethanol against *A. flavus* and to examine the preliminary phytochemical screening of the effective extract.

Materials And Methods

✓ Ten kg of fresh rhizomes of *B. rotunda* and 500 g of flower buds of *S. aromaticum* were washed and dried at 60° C until they reached a constant weight. .

Dried rhizomes of *B. rotunda* or flower buds of *S. aromaticum* (200 g of each sample)

Dichloromethane extracts

- *B. rotunda* = 1.59%
- *S. aromaticum* = 2.08%

Residues

Ethanol (500 m)

Ethanol extracts

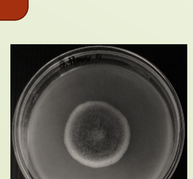
- *B. rotunda* = 4.49%
- *S. aromaticum* = 5.15%

Residues

Discards

Extracts

Antifungal activity



(Selecting the effective extract)

Phytochemical screening test

Results

➢ Antifungal activity

Table 1. Antifungal activity of *B. rotundo* and *S. aromaticum* extracts against *Aspergillus flavus* at 1,000 mg/l.

Plant	Extract	% Mycelia growth inhibition (%mean*±S.D.), *n*=3
B. rotundo	Dichloromethane	45.93±0.57[a]
	Ethanol	50.93±0.10[a]
S. aromaticum	Dichloromethane	25.19±0.14[b]
	Ethanol	27.41±0.12[b]
Negative Control	1% DMSO	0.00[c]
Positive control	Nystatin (0.05 mg/ml)	49.25±0.23[a]

* Significant difference ($p<.05$, DMRT)

Table 2. The MIC/MFC values of ethanol extracts of *B. rotunda* against *A. flavus*

Treatment	MIC	MFC	MFC indice	Mode of Action
Ethanol	6.25	50.00	8.00	Fungistatic
Nystatin	2.15	3.50	1.63	Fungicidal

➢ Phytochemical screening test

Table 3. Phytochemical test results of ethanol extract

Phytochemicals	Result*
Alkaloids	+
Anthaquinones	-
Flavonoids	+++
Terpenoids	-
Steroids	-
Cardiac glycoside	++
Saponins	+
Tannins	-
Phlobatannins	-

Note: *(-) = Negative test; (+) = Weak positive test; (++) = Positive test; (+++) = Test strongly positive

Conclusions

The ethanol rhizome extract of *B. rotunda* showed significantly potent antifungal activity against *A. flavus*. Alkaloids, flavonoids, cardiac glycosides, and saponins were discovered as phytochemicals. Furthermore, the ethanol rhizome extract of *B. rotunda* would isolate the anti-*A. flavus* compounds for a new generation of topical agents.

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