

# Journal of Research and Development

*A Multidisciplinary International Level Referred Journal*

**July 2021    Volume-11    Issue-24**

***Impact of Environment on Agriculture, Health,  
Water Resources, Social Life & Industrial  
Development***

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**Dr. R. V. Bhole**

'Ravichandram' Survey No-101/1, Plot  
No-23, Mundada Nagar, Jalgaon

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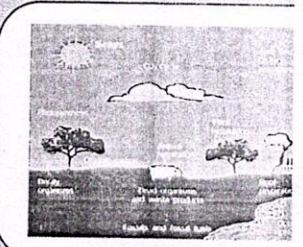
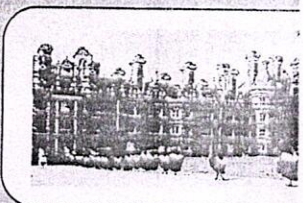
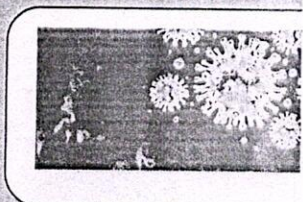
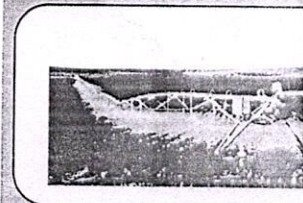
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*20 July 2021 Volume-11 Issue-24*

*On*

*Impact of Environment on Agriculture, Health, Water  
Resources, Social Life & Industrial Development*

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## Antifungal properties of corm of *Amorphophallus campanulatus* Roxb.

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### Abstract

The corm extracts of *A. campanulatus* were utilized against five pathogenic fungi for their management the fungi *Neurospora crassa*, *Cladosporium oxysporum*, *A. flavus*, *A. niger* and *Candida albicans* were employed for this study. A different solvent system as Methanol, Petroleum ether and ethyl acetate were utilized and evaluate minimum inhibitory concentration was recorded according to test pathogen MIC against *Cladosporium oxysporum* was recorded in presence of methanolic corm extract of *A. campanulatus* inhibition was found only in ethanolic concentration at 1 mg/well concentration. In case of *A. flavus* MIC was found at concentration of 2 mg/well and MIC of *A. niger* was exhibited in presence of petroleum ether corm extract of *A. campanulatus* followed by methanol extract at 2 mg/ well concentration the similar result has been observed in case of *C. albicans* and *neurospora crassa*

### Introduction

*A. campanulatus* Roxb. Belong to the family Araceae which is commonly known as elephant foot yam. This species is distributed throughout India. The kinwat forest has ample wealth of medicinal plants the forest type is dry deciduous M.P ( Naik 1969 and 1998, W.Khan 1985, Zate 1983). It is a stout herbaceous plant with underground hemispherical dark brown corm. The tuberous root of *A. campanulatus* has been utilized as indigenous medicine for treatment of piles, abdomen pain, spleen enlargement, asthma, rheumatism, liver tonic and aphrodisiac (Bhattacharya et al 1990, Ghani A. 1998, Kartikar R. R. 1994, Warriar P.K. 2005, R. Malignum 2010) *A. campanulatus* contains antifungal, antibacterial components which are very important as modern trend for management of pathogen in agriculture to be given alternative to traditional plant disease control. It is also referred as biological control. The management of post harvest fungi by using the corm extract of *A. campanulatus* has been attempted and found effective. Such bioagents have been reported to be highly potential, economical, safe and ecofriendly used to management of plant pathogenic fungi (post harvest fungi) which were isolated from the food grains specifically from cereals and oil seeds.

The minimum inhibitory concentration MIC of *C. Oxysporum* was recorded in presence of Methanolic corm Extract of *A. campanulatus* roxb. inhibition was found only in the methanolic corm extract of *A. campanulatus* roxb. At 1mg/well concentration.

Antifungal activity and minimum inhibitory concentration MIC values mg/well of corm extract of *A. campanulatus* roxb. Against *C. oxysporum*

Sr. NO	Compounds Name	Concentration of compound						
		0.0625mg	0.125mg	0.25mg	0.5mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>A. campanulatus</i>	0	0	0	0	0.2	0.6	1
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0	0	0.1	2
3	Ethyl acetate extract of <i>A. campanulatus</i> .	0	0	0	0	0	0	0
4	Standard drug Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0.2	0.7	0.9	1.3	1.5	50

Antifungal activity and minimum inhibitory concentration MIC values mg/well of corm extracts of *A. campanulatus* roxb. Against *A. flavus* and *A. niger*

corm extracts of *A. campanulatus* roxb. And minimum inhibition was found at concentration 2 mg/well.

The minimum inhibitory concentration MIC was recorded against *A. flavus* in the As per the result, maximum inhibition of *A. niger* was exhibited in presence of petroleum ether corm extracts of *A. campanulatus* roxb. Followed by methanol extracts at concentration of 2 mg/well. The minimum inhibitory concentration mic was recorded against *A. niger* in the corm extracts of *A. campanulatus* roxb. And minimum inhibition was found in case of petroleum ether corm extract of *A. campanulatus* roxb. At concentration 1 mg/well.

Table 1: Antifungal activity and minimum inhibitory concentration MIC values mg/well of corm extracts of *A. campanulatus* roxb. Against *A. niger*

Sr. NO	Compound Name	Concentration of compound						
		0.0625mg	0.125mg	0.25mg	0.5mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>A. campanulatus</i>	0	0	0	0	0	0.5	2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0	0	0.2	2
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0	0	0	0.7	1	400

Table2: Antifungal activity and minimum inhibitory concentration MIC values mg/well of corm extracts of *A. campanulatus* roxb. Against *A. niger*

Sr. NO	Compounds Name	Concentration of compound						
		0.0625mg	0.125mg	0.25mg	0.5mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>A. campanulatus</i>	0	0	0	0	0	0.3	2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0.1	0.5	0.7	0.5
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0	0.2	0.3	0.5	0.7	100

**Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of fruit extracts of *Amorphophallus campanulatus* (Roxb.) against *Neurospora crassa***

In order to investigate the antifungal activity of corm extracts of *Amorphophallus campanulatus* (Roxb.) were utilized against five pathogenic fungi for their growth management. The fungi which are, *Neurospora crassa*, *Cladosporium oxysporum*, *Aspergillus flavus*, *Aspergillus niger* and *Candida albicans* employed for this study. The methanol, petroleum ether corm extracts of *Amorphophallus campanulatus* (Roxb.) used against *Neurospora crassa* for their management with their concentrations 0.0625 to 2mg well were employed for the observation and determination of antifungal and minimum inhibitory concentration (MIC). The results are very favorable to the control of the test fungi and summarized in the table 3. As per the results the maximum inhibition zone was exhibited in presence of petroleum ether corm extracts of *Amorphophallus campanulatus*. It is very significant to note that methanol and ethyl acetate extracts was unable to exhibit their zone of inhibition for test fungi up to 2 mg/well concentration. The minimum inhibitory concentration (MIC) was evaluated against *Neurospora crassa* in presence of the tested corm extracts of *Amorphophallus campanulatus* (Roxb.) and minimum inhibition was found in petroleum ether extracts at the concentration of 2mg/well.

**Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Cladosporium oxysporum***

In order to understand the antifungal efficiency of the corm extracts of *Amorphophallus campanulatus* (Roxb.) with their different solvent system were used against *Cladosporium oxysporum* the data of the results are summarized in the table 4. As per the data, maximum inhibition of *Cladosporium oxysporum* was observed in presence of methanolic, corm extracts of *Amorphophallus campanulatus* (Roxb.) followed by petroleum ether extracts at the concentration of 2mg/well. The minimum inhibitory concentration (MIC) of *Cladosporium oxysporum* was recorded in presence of both the corm extracts of *Amorphophallus campanulatus* (Roxb.) and minimum inhibition was found only in presence of methanolic corm extract of *Amorphophallus campanulatus* (Roxb.) at 1mg/well concentration.

Table 3: Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Neurospora crassa*

Sl. No.	Compounds Name	Concentration of Compound						
		0.0625 mg	0.125 mg	0.25 mg	0.5 mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>Amorphophallus campanulatus</i>	0	0	0	0	0	0	>2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0	0	0.4	2
3	Ethyl acetate extract of <i>Amorphophallus campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug (Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0	0	0	0.7	0.9	400

**Table 4: Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Cladosporium oxysporum***

Sl. No.	Compounds Name	Concentration of Compounds						
		0.0625 mg	0.125 mg	0.25 mg	0.5 mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>Amorphophallus campanulatus</i>	0	0	0	0	0.2	0.6	1
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0	0	0.1	2
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug (Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0.2	0.7	0.9	1.3	1.5	50

Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Aspergillus flavus*

In order to understand the antifungal activity of the corm extract of *Amorphophallus campanulatus* (Roxb.) with their different solvents were used against *Aspergillus flavus*, the data of the results are summarized in the table 5. As per the results maximum inhibition of *Aspergillus flavus* was found to be in presence of methanol corm extracts of *Amorphophallus campanulatus* (Roxb.) followed by petroleum ether extracts at the 2mg/well concentration.

The minimum inhibitory concentration (MIC) was recorded against *Aspergillus flavus* in presence of the tested corm extracts of *Amorphophallus campanulatus* (Roxb.) and minimum inhibition was found in the tested corm extracts *Amorphophallus campanulatus* (Roxb.) at concentration 2mg/well.

Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Aspergillus niger*

In order to know the antifungal activity of the corm extract of *Amorphophallus campanulatus* (Roxb.) with their different solvents were used against *Aspergillus niger*, the results are summarized in the table 6. As per the result, maximum inhibition of *Aspergillus niger* was exhibited in presence of petroleum ether corm extracts of *Amorphophallus campanulatus* (Roxb.) followed by methanol extract at concentration of 2mg/well.

The minimum inhibitory concentration (MIC) was recorded against *Aspergillus niger* in presence of both the corm extracts of *Amorphophallus campanulatus* (Roxb.) and minimum inhibition was found in case of petroleum ether corm extract of *Amorphophallus campanulatus* (Roxb.) at concentration 1mg/well.

**Table 5: Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Aspergillus flavus***

Sl. No.	Compounds Name	Concentration of Compound						
		0.0625 mg	0.125 mg	0.25 mg	0.5 mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>A. campanulatus</i>	0	0	0	0	0	0.5	2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0	0	0.2	2
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug (Amphotericin)	25	50	100	200	400	800	MIC

		µg	µg	µg	µg	µg	µg	µg
5	Readings	0	0	0	0	0.7	1	400

Table 6: Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Aspergillus niger*

Sl. No.	Compounds Name	Concentration of Compound						
		0.0625 mg	0.125 mg	0.25 mg	0.5 mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>A. campanulatus</i>	0	0	0	0	0	0.3	2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0.1	0.5	0.7	0.5
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug (Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0	0.2	0.3	0.5	0.7	100

Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Candida albicans*

In order to understand the antifungal activity of the corm extract of *Amorphophallus campanulatus* (Roxb.) with their different solvents were used against *Candida albicans*, the evaluated data was given in the table 7. As per the results, maximum inhibition of *Candida albicans* was observed in presence of petroleum ether corm extracts of *Amorphophallus campanulatus* (Roxb.) followed by methanol extracts at concentration of 2mg/well.

The minimum inhibitory concentration (MIC) was recorded against *Candida albicans* in presence of both the test extracts of corm of *Amorphophallus campanulatus* (Roxb.) and minimum inhibition was expressed in presence of petroleum ether corm extract of *Amorphophallus campanulatus* (Roxb.) at the concentration 0.5mg/well.

Table 7: Antifungal activity and minimum inhibitory concentration (MIC) values (mg/well) of corm extracts of *Amorphophallus campanulatus* (Roxb.) against *Candida albicans*

Sl. No.	Compounds Name	Concentration of Compound						
		0.0625 mg	0.125 mg	0.25 mg	0.5 mg	1 mg	2 mg	MIC mg
1	Methanol extract of <i>Amorphophallus campanulatus</i>	0	0	0	0	0	0.2	2
2	Petroleum ether extract of <i>A. campanulatus</i>	0	0	0	0.1	0.3	0.7	0.5
3	Ethyl acetate extract of <i>A. campanulatus</i>	0	0	0	0	0	0	0
4	Standard drug (Amphotericin)	25 µg	50 µg	100 µg	200 µg	400 µg	800 µg	MIC µg
5	Readings	0	0	0.1	0.3	0.5	0.7	70

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