



# In Vitro Screening Of Antifungal Activity Of Acetone Bark Extract Of *Adansonia Digitata L.*

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**Abstract :** The Present investigation deals with in vitro study of antifungal activity of bark extract of *Adansonia digitata L.* The extract was prepared in acetone solvent and subjected to Soxhlet apparatus, the activity was measured by well diffusion method, using test fungi such as *Ampelomyces quisqualis*, *Aspergillus flavus*, *Aspergillus niger*, *Drechslera avenaceum*, *Fusarium oxysporum* and *Trichoderma viride*. These test fungi were found to be more sensitive to crude extract as compared to control acetone solvent. A maximum inhibition zone was recorded in *Aspergillus niger* and *Trichoderma viride*. Proved that acetone extract of bark possess good antifungal activity.

## Index Terms -

*Adansonia digitata L.*, *Ampelomyces quisqualis*, *Aspergillus flavus*, *Aspergillus niger*, *Drechslera avenaceum*, *Fusarium oxysporum*, *Trichoderma viride* and acetone.

## 1. INTRODUCTION

*Adansonia digitata L.*, commonly called as baobab tree, luxuriantly growing in hot and dried regions of African countries and belongs to family : Malvaceae. The tree possess a huge trunk, with a height of 15-20 meters. It is native of tropical Africa, but even it is cultivated in some parts of Tamil Nadu, Bihar, Uttar Pradesh and Maharashtra States in India. In Indian language it is called Gorak shee or Gorak amla and has been used as a tribal medicine, as it possess anti-inflammatory, aperients, demulcent and astringent properties.

The plant possess a large number of phytochemicals or primary or secondary metabolites which can be categorized as carotenoids, polyphenols, flavonoids, stilbenes or lignans ( Molyneux *et al.*, 2007). The pulp contains mucilage, phlobaphenes, gums, tartrate of acetate, glucose and other salts. The bark contains B-sitosterol, tannins, pectins, glucoside, adansonin, etc. whereas seed shows cholesterol, B-sitosterol, stigmasterol. The flavonoids such as flavones, isoflavones, flavonols, catechins, proanthocyanidins, epicatechin are abundant in plant. Therefore, leaves of *Adansonia digitata L.* are used as diaphoretic and prophylactic against fever, poultice for rheumatic affection of limbs and irritable inflammatory ulcer. The decoction of bark is used for malarial treatment whereas fruit pulp is used in dysentery treatment. Again it is also useful in bilious dyspepsia as well as in acid eructation. The high content of vitamin C in fruit pulp is used in beverages and cosmetics. As the plant shows enormous phytochemicals, therefore an attempt was made to study its antifungal activity of bark in acetone extract against few fungal pathogens.

## 2. METHODS AND MATERIALS

The fresh bark of *Adansonia digitata L.* was collected from Department of Botany, Shivaji University, Kolhapur during month of January 2023, for experimental study. The bark sample collected, brought to the laboratory, washed with tap water, followed by 1-2 times with distilled water. The bark was cut into several pieces and was shade dried for 1-2 days, followed by electric oven for 2 consecutive days at 60°C. Soon after, bark dried pieces were powdered in domestic grinder into fine powder. About 15 gram of fine bark powder was subject to extraction, the extraction was carried out by Soxhlet apparatus using acetone as solvent. Further the extract was concentrated by evaporating it in a water bath at 60°C for 25-40 minutes. So that semi-solid liquid extraction was used for assessing antifungal activity. For studying antifungal activity, agar well diffusion method was used (Alice and Sivaprakasam, 1966 and Collins and Lyne, 1976), using test fungi such as *Ampelomyces quisqualis*, *Aspergillus flavus*, *Aspergillus niger*, *Drechslera avenaceum*, *Fusarium oxysporum*, *Trichoderma viride* and these test fungi were procured from Department of Agro Chemicals and Pest Management and Department of Botany, Shivaji University, Kolhapur.

The fungal suspension was prepared using saline water mixed with potato dextrose agar media and was transferred to sterile petri plates. After solidification, wells or cup was scooped with the help of cork borer (8mm in diameter). The acetone bark solutions were poured into the wells with the help of micro pipettes. The culture petri plates were kept for incubation at 25°C to 27°C for 48 hours and zone of inhibition was recorded in centimeters and Mean of triplicates was calculated.

### 3. RESULTS AND DISCUSSION

The results were depicted in Table-1 and Figure-1. Among the six test fungi screened for antifungal activity in acetone bark extract of *Adansonia digitata* L., *Aspergillus niger* and *Trichoderma viride* species were shown sensitive to crude extract. A maximum inhibition zone of 2.8 cm was recorded against *Aspergillus niger* followed by 2.6 cm inhibition zone against *Trichoderma viride*, proved that, acetone crude extract possess several phytochemicals, acts as a potent antifungal compounds. A similar finding was reported by Nagaraja (2011) in *Zanthoxylum rhetsa* (Roxb)., and Nagaraja (2010) in *Orobanche aegyptiaca* pers. Meanwhile, less zone of 2.0 cm has been recorded against *Ampelomyces quisqualis*, indicates presence of few a phytochemicals may function as antifungal agents (table-1). Though it is a hyperparasite on *Oidium sp.*, a good biocontrol agent for controlling powdery mildew diseases in crop plants.

The crude acetone extract of *Adansonia digitata* L. shows a rapid sensitive towards two pathogenic fungi- *Drechslera avenaceum* and *Aspergillus flavus*. An inhibition zone of 2.4 cm has been recorded against *Drechslera avenaceum* and 2.3 cm against *Aspergillus flavus*. Suggested that acetone bark extract has good amount of antifungal compounds. A parallel document was recorded by Somesh *et al.*, (2020) in acetone bark of *Eucalyptus globules* Labill., against *Aspergillus niger*, again Nagaraja (2019) in ethanol extract of leaves of *Rauvolfia tetraphylla* L. against *Alternaria alternata*.

Besides potential rot fungus cause wilting and damping diseases among crop plants- *Fusarium oxysporum* exhibit a moderate zone of inhibition against acetone crude extract of *Adansonia digitata* L. (table-1, fig-1). A concurrent report was documented by Nagaraja *et al.*, (2009) in *Mappia foetida miers* acetone extract of leaves and Rani and Mutri (2006). Higher angiosperm plant extract acts as a potential renewable source of antibiotics against pathogenic fungi and bacteria (Fridous *et al.*, (1990). Therefore, even plant extract in different solvent may act as potential bio-pesticide. Similarly, Vaibhav *et al.*, (2020) reported acetone extract of *Cucumis sativus* var. *Hardwickii* against *Drechslera* and *Fusarium species*.

Hence, this type of study helps to prepare different formulations for the management of plants diseases as an eco friendly biopesticides.

### 4. ACKNOWLEDGEMENT

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**6. FIGURES AND TABLES****Table-1: Antifungal activity of acetone bark extracts of *Adansonia digitata L.***

SR. NO	TEST Organisms	INHIBITION ZONE (in cm)				
		CONTROL ACETONE	1	2	3	MEAN*
1	<i>Ampelomyces quisqualis</i>	0.2	1.9	2.2	1.9	2.0
2	<i>Aspergillus Flavus</i>	0.2	2.2	2.3	2.5	2.3
3	<i>Aspergillus Niger</i>	0.2	2.7	2.9	3.0	2.8
4	<i>Drechslera avenaceum</i>	0.2	2.7	2.5	2.2	2.4
5	<i>Fusarium oxysporum</i>	0.2	2.5	2.2	2.5	2.4
6	<i>Trichoderma Viride</i>	0.2	2.2	2.7	3.0	2.6

Expressed as: \* Mean of Triplication



## 7. Figure 1: Microphotographs.

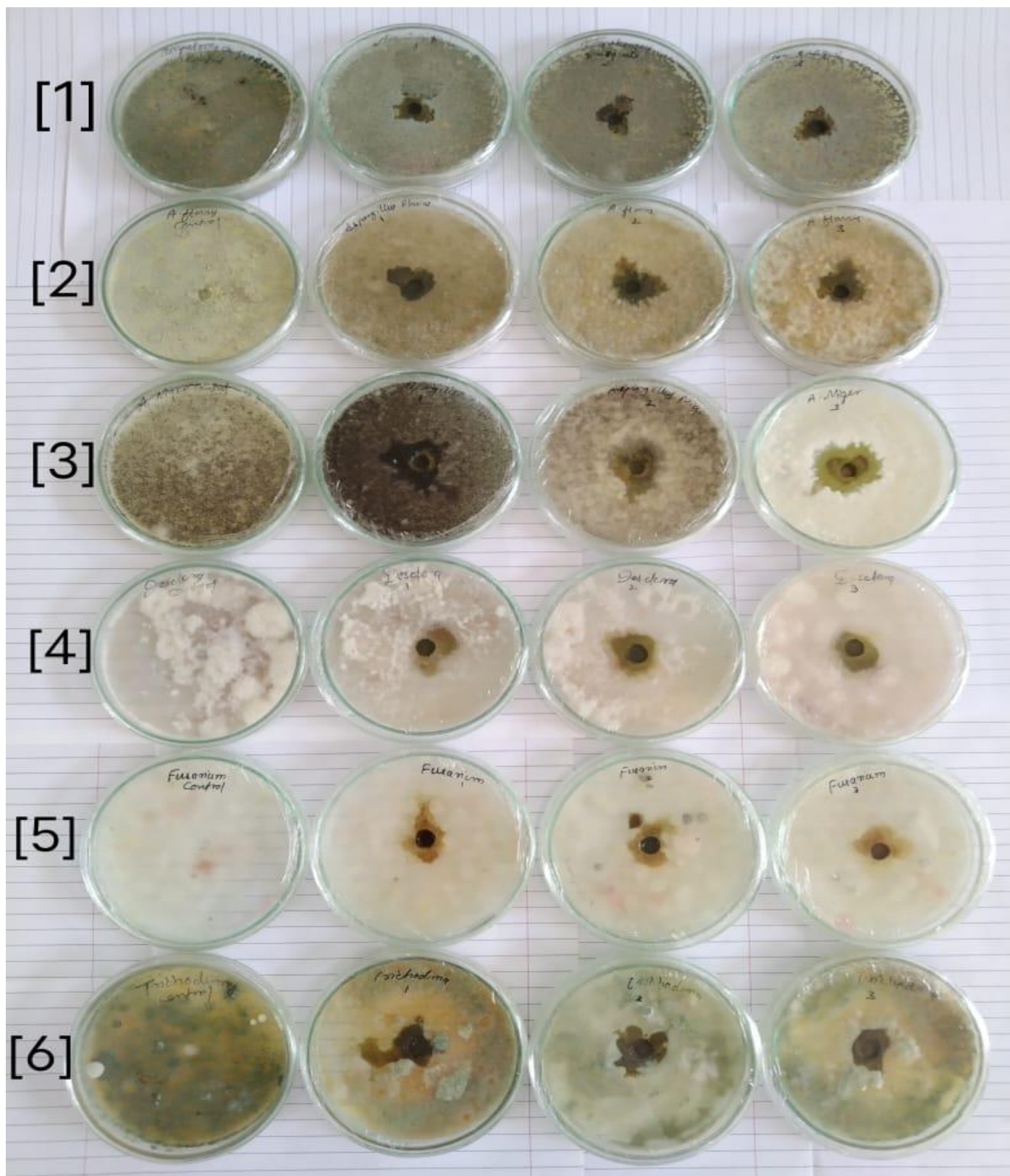


Figure-1 shows that: [1] Bark extract against *Ampelomyces quisqualis*; [2] Bark extract against *Aspergillus Flavus*; [3] Bark extract against *Aspergillus Niger*; [4] Bark extract against *Drechslera avenaceum*; [5] Bark extract of *Fusarium oxysporum*; [6] Bark extract of *Trichoderma Viride*