



IN VITRO SCREENING OF ANTI FUNGAL ACTIVITY IN ACETONE FRUIT EXTRACT OF *STERCULIA FOETIDA L.*

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ABSTRACT

The present paper deals with the in vitro screening of antifungal activity of *Sterculia foetida L.* fruit in acetone extract. The extraction was made by Soxhlet's apparatus, the activity was measured by well diffusion method, using test fungi such as *Aspergillus flavus*, *Colletotrichum sp.*, *Drechslera avenaceum*, *Fusarium oxysporum* and *Trichoderma viridi*. These test fungi were found to be sensitive to extract as compared to control. A maximum zone of inhibition was recorded against *Aspergillus flavus* followed by *Fusarium oxysporum* and *Colletotrichum sp.* This proves acetone extract of fruit of *Sterculia foetida L.* possess good amount of anti fungal properties. Hence, may be used as ecofriendly plant fungicide.

Key word's - *Aspergillus flavus*, *Colletotrichum sp.*, *Drechslera avenaceum*, *Fusarium oxysporum* *Trichoderma viridi*, *Sterculia foetida*.

INTRODUCTION

Sterculia foetida L., a tall, deciduous perennial umbrella shaped tree belonging to the family. Sterculiaceae, has huge hidden potentiality for its pharmaceutical and medicinal properties. It is also called wild almond, Poon tree, Java olive, Hazel Sterculia etc., In Hindi it is known as Jangli badam, found in throughout East-Asia-India, Sri-lanka, thiland etc. The tree is abundant in low lands, as well as dry wood lands.

The plant possess much medicinal value, all most all parts of the plant in useful in treating different ailments. The plant possess carminative, anti-inflammatory, laxative, astringent, insecticidal anti-viral, hormonal, carcinogenic or anti-tumor, antibiotic, antibacterial properties. The bark decoction is used in the treatment of dropsy and rheumatism, even an diaphoretic and on diuretic (Chopra et al.,1992) fruit decoction is used in the treatment of gonorrhoea, diarrhea and astringent. The leaf decoction is used in the treatment of

supportive cutaneous eruption, and on abortifacient and diuretic. The seed or seed oil shows laxative effect, and used externally in rheumatism.

The tree possess abundant medicinal properties, and its phytochemical constituents. Includes, fatty acids, flavonoids, triglycerides, cyclopropenoids, sterculic acid, tetradecanoic acid, hexanedioic acid, azuleneectuanol. oleic acid, palmitic acid, myristic acid (Kavita et al., 2015) taraxerol, B-sitosterol n-octacosanol. etc. (Anjaneyulu and Suryanarayan,1981), presence of huge phytochemical, lead to motivate to study its antifungal activity. Hence, an attempt was made to study acetone extract of fruit of *Sterculia foetida L.*, its anti fungal properties.

MATERIAL AND METHODS

Fresh fruits of *Sterculia foetida L.* were collected from Nearby D.K.A.S.C College Ichalkaranji. for experimental study in the months of the Jan 2023, periodically. The collected fruit samples were brought to the laboratory, washed with tap water initially followed by distilled water. The fruits were dried in shade for 1-2 days, followed by kept in Electric oven at 60°C for 1-2 consecutive days. The dried fruit samples were cut into small pieces and grind into fine powder using domestic grinder. The 15g of fine powder was used for extraction, the extraction was carried out by using Soxhlet's apparatus with acetone on solvent. The extraction carried out for 12-14 hours, soon after extraction evaporated in a water bath, till a brownish green semi-solid gummy material was obtained, and used for studying anti fungal activity.

The Five different species of test fungus viz., *Aspergillus flavus*, *Colletotrichum sp.*, *Drechslera avenaceum*, *Fusarium oxysporum*, and *Trichoderma viridi* were procured from Department of Botany and Department of Microbiology, Shivaji University, Kolhapur and maintained in PDA and Czapek Dox media. Fungal spore suspension were prepared with distilled water 2-3 ml of spore suspension mixed with 100 ml of sterilized PDA with constant shaking, 20 ml of seeded medium was transferred to sterile petri-dishes and kept for solidification (Collin and Lyne, 1976). After solidification, a well was scooped at the center, with 5 mm diameter using sterile cork borer. The test fungi solution of 0.5ml was poured in all petri dishes according method of Alice and Sivaprakasan (1996). Three replicates were maintained along with one control, using acetone solvent. These inoculated cultured plates were kept for incubation at 28°C for 48 hours, and inhibition zone was recorded in millimeter.

RESULT AND DISCUSSION

The results were depicted in Table - I and figure-1. Among five test fungi screened for antifungal activity in a acetone fruit extract of *Sterculia foetida L.*, *Aspergillus flavus*, *Fusarium oxysporum*, and *Colletotrichum sp.*, show a sensitive to crude extract, where as a moderate Sensitive was recorded in *Trichoderma viridi* and *Drechslera avenaceum*. A maximum mean inhibition was recorded against *Aspergillus flavus* i.e 4.09 mm as compared to control 0.6 mm, followed by *Fusarium oxysporum* 2.69 mm this indicates that crude extract possess several phytochemicals, having good antifungal properties. A parallel document was reported by Nagaraja (2011) in *Zanthoxylum rhetsa*, Nagaraja (2010) in *Orobanche*

aegyptica and Omkar and Nagaraja (2023) in *Adansonia digitale L* bark. Meanwhile a very less zone of inhibition was recorded (table.1) against *Drechlera avenaceum* 1.51 mm, as compared to control (0.6mm).

The crude extract of *Sterculia foetida L* fruit prepared in acetone, has a moderate sensitivity against test fungi *Fusarium oxysporum* (Table. 1. Fig. 1) It shows a Inhibition zone of 2.69 mm as compared to control 0.64 mm followed by 2.16 mm against *Colletotrichum Sp.* suggest that crude extract possess a moderate amount of antifungal compounds. A concurrent report were recorded by Somesh et al., (2020) in acetone bark extract of *Eucalyptus globulus*, again Nagaraja (2019) in *Rauvolfia tetraphylla* against *Alternaria alternata*.

It is well known fact that plant and its part have huge phytochemicals, these phytochemicals have a good amount of antifungal compounds, hence, pathogenic fungi such as *Drechlera avenaceum* and *Trichoderma viridi* shows sufficient sensitive reactions to crude extract. A 2.04 mm of inhibition zone was recorded (Table 1. Fig 1) against *Trichoderma viridi* followed by 1.51 mm against *Drechlera avenaceum*. A Similar findings was recorded by Nagaraja (2013) in *Garcinia indica* and Iqbal zatar et al., (2002) Even angiosperm plant extract acts a potential renewable source of antibiotics against fungi and bacteria (Fridous et oal., 1990). Therefore different solvent form a potential source of bio-fungicides in angiosperm plants. Vaibhav et al., (2020) reported acetone extract of *Cucumis sativus var Hardwickii* against *Drechlera* and *Fusarium oxysporum*. Therefore present study may help to Prepare different formulation for the management of plant diseases in agriculture as a eco-friendly bio-fungicide.



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TABLE:- I

Table -1: In vitro screening of Antifungal activity of Acetone fruit extract of *Sterculia foetida* L.

Sr. No.	Test Organisms	INHIBITION ZONE (in cm)				
		CONTROL ACETONE	1	2	3	MEAN*
1	<i>Aspergillus flavus</i>	0.6	2.0	1.05	1.04	1.36
2	<i>Colletotrichum sp.</i>	0.6	1.05	3.0	2.0	2.01
3	<i>Drechslera avenaceum</i>	0.6	1.54	1.43	1.57	1.51
4	<i>Fusarium oxysporum</i>	0.6	3.0	3.06	2.02	2.69
5	<i>Trichoderma viridi</i>	0.6	2.05	2.03	2.04	2.04

Expressed as: * Mean of Triplication.

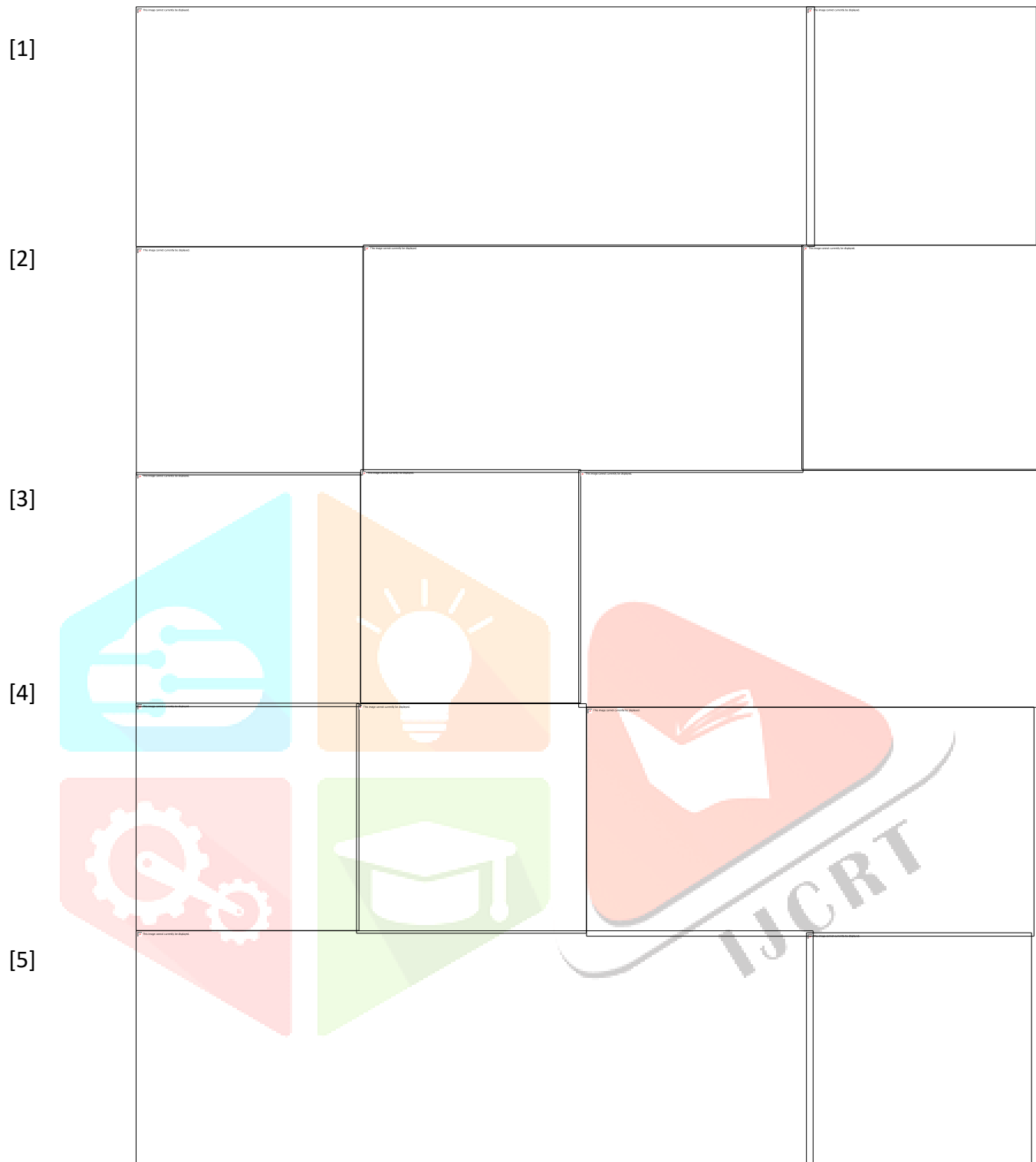


Figure-1 shows that: [1] fruit extract against *Aspergillus flavus*. [2] fruit extract against *Colletotrichum sp.* [3] fruit extract against *Drechslera avenacum*. [4] fruit extract against *Fusarium oxysporum*. [5] fruit extract against *Trichoderma viridi*.

First Coloum represents control petri dishes.