



# IN VITRO SCREENING OF ANTIFUNGAL ACTIVITY IN METHANOL LEAF AND STEM EXTRACT OF *ELAEAGNUS LATIFOLIA L.*

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## ABSTRACT

The present research paper deals with in vitro screening of antifungal activity in leaf and stem of *Elaeagnus latifolia L.* in methanol extract. The extract was prepared in methanol solvent using Soxhlet's apparatus. The activity measured by well diffusion method, using test fungi such as *Aspergillus niger*, *Colletotrichum sp.*, *Dreschler avenaceum*, *Fusarium oxysporium* and *Trichoderma viride*. These test fungi were found to be sensitive to crude extract of leaf and stem of *Elaeagnus latifolia L.* as compared to control methanol solvent. A maximum zone of inhibition was recorded against *Fusarium oxysporium* and *Colletotrichum sp.*, in methanol leaf extract, whereas *Fusarium oxysporium* and *Dreschler avenaceum* recorded maximum zone of inhibition in methanol stem extract. This indicates methanol extract of leaf and stem possess a good amount of antifungal properties.

**KEY WORDS:** *Aspergillus niger*, *Colletotrichum sp.*, *Dreschler avenaceum*, *Fusarium oxysporium*, *Trichoderma viride*, Soxhlet's apparatus, *Elaeagnus latifolia L.*

## INTRODUCTION

*Elaeagnus latifolia L.* is a much branched deciduous, spreading tall evergreen shrub with often thorny stem, growing subtropical and warm temperature zone, in Asia, China and Sri Lanka, belong to family: Elaeagnaceae. The genus comprises five species, which are distributed in Vietnam. In India naturally growing in western ghats of Maharashtra state and cultivated in the garden as a hedge plant.

This deciduous shrub is mostly grown in back yard garden of many families of the region and harvested during March and April 3-4 picking. Fruit could be utilized for making jam, jelly, pickle, and refreshing drinks. The fruits of many members of this genus including *Elaeagnus latifolia L.* is very rich

source of vitamins, especially vit.-A,C,E, essential fatty acids, minerals, carotenoids and other bioactive compounds.

In vitanam, Thailand and India, *Elaeagnus latifolia L.* is used as traditional medicine for treatment of diarrhea, dysentery, asthma and bleed. The methanol extract of this plant showed antioxidant, antimicrobial and DNA protective activities.

The plant contain huge phytochemicals such an flavonoids compounds , sitosterols, cardiac glycosides, terpenoids ( Burges 2008; Beigon Taheri et al,2010). Polyphenolic compounds includes flavone, flavonols, isoflavone, flavanol, flavanone, anthocyanin and proanthocyanidin.The flavonoids like, Quercetin, luteolin, catechin, epicatechin, epigalloeatechin, kaempferol, gallocatechin, isorhamnetin and galactopyranoside etc.(Si et al.2009,wang and wei 2010),as plant with rich phytochemicals, hence an attempt was made to study antifungal activity in methanol extract of its leaves and stem against five test fungi.

## MATERIAL AND METHODS

The fresh leaves and stems of *Elaeagnus latifolia L* were collected from Department of Agrochemicals and Pest Management, Shivaji University, Kolhapur for experimental study. The collected sample were brought to laboratory first washed with tap water, followed by distilled water. Soon after cut into small pieces and sun dried for 1-2 days, later kept in electric oven at 60<sup>0</sup>c for 2 consecutive days. Soon after dried leaves and stem piece were powdered in domestic grinder into fine powder. About 15 grams of leaf and stem powder were subjected to extraction. The extraction were carried out by Soxhlet's apparatus, using methanol an solvent. Further the extract were concentrated by evaporating in water bath at 55<sup>0</sup>c for 30 min. So that a semi solid , yellow coloured gummy liquid was formed. This liquid is used for studying antifungal activity.

The test fungi such as *Aspergillus niger*, *Colletotrichum sp.*, *Dreschler avenaceum*, *Fusarium oxysporium* and *Trichoderma viride* were procured from Department of Agrochemicals and Pest Management, Shivaji University, Kolhapur and maintained in PDA and Czapek Dox Agar medium. The Antifungal activity studied by agar well diffusion method, as prescribed by Alice and Sivaprakasam (1966)and Collins and Lyne(1976) method.

Fungal spore suspension were prepared in distilled water, 2-3 ml of spore suspension mixed with 100 ml of sterilised PDA with constant shaking, 20 ml of seed medium was transfered to sterile petridish and kept for solidification. After solidification, a well was scooped at the centre, with 5mm diameter using sterile cork borer. The test fungi solution of 0.5 ml was poured in all petridishes. Three replication were maintained along with one control using methanol solvent. These inoculated culture plates were kept for incubation at 28<sup>0</sup>c for 48 hours, and zone of inhibition was recorded in millimetre.

## RESULT AND DISCUSSION

The results were shown in Table no.1 Fig.1. Among five test fungi screened for antifungal activity in methanol extract of leaf and stem of *Elaeagnus latifolia* L., The fungi *D Colletotrichum sp.*, *Fusarium oxysporium* and *Aspergillus niger* show a high rate of sensitive to crude extract. Normally all test fungi reacted to crude extract. A maximum zone of inhibition was recorded against *Colletotrichum sp.*, 29.6 mm as compared to control (100%) in methanol extract, followed by *Fusarium oxysporium* 29.4 mm. On the contrary methanol stem extract of *Elaeagnus latifolia* L. (Table 1 fig.1) was much sensitive to *Fusarium oxysporium* as it shows 21.3 mm of inhibition, followed by *Dreschler avenaceum*, 20.6 mm as compared to control methanol (100%). This indicates that acetone extract of leaf and stem of *Elaeagnus latifolia* L. possess huge potent anti-fungal compounds, which are readily soluble in solvent methanol. A concurrent findings was reported by Nagaraja (2011) in *Zanthoxylum rhetsa* and Nagaraja (2010) in *Orobanchae aegyptiaca Pers.* and Nagaraja (2013) in *Garcinia indica* against *Alternaria alternata*.

The methanol acts as a good solvent, wherefore maximum sensitivity was recorded in crude extract. Leaf methanol extract of *Elaeagnus latifolia* L. shows 25.8 mm of inhibition as compared to control methanol (100%). A parallel document was reported by Saha, et al (2005) in ethanol extract of *Allium sativum* L., and *Curcuma longa* L. against *Colletotrichum camelliae*, similarly Mestri and Nagaraja (2023) computing findings were reported in *Adansonia digitata* against *Trichoderma viride*.

(Table 1 fig.1). Suggest that well account of anti-fungal compounds in methanol extract. A collateral record was reported by Vaibhav, et al. (2020) in *Cucumis sativus* Var. *Hardwickii* royle and Nagaraja (2019) in *Rauwolfia tetraphylla* L. Mean while a least zone of inhibition was recorded in methanol extract of leaf and stem of *Elaeagnus latifolia* L. 20.3 mm and 10.3 mm as compared to control (100%) Table 1 fig.1. Even angiosperm medicinal plants shows higher rate of anti-fungal activity (Irawan et al. 2009).

A coincidental findings was reported by Jennifer et al. (2017) in *Ricinus communis* against *C. albicans*. From this substantiation, different solvents may act as potential Bio-pesticide. Hence this type of research work helps to prepare different formulation for the management of plant disease as an eco-friendly plant fungicide.

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## FIGURES AND TABLES

Table No. 1: Methanol leaf extract of *Elaeagnus latifolia* L. against test fungi.

Sr. No.	Test Fungi	Zone of inhibition (Diameter in mm) leaf extract				
		Methanol control	1	2	3	Mean
1	<i>Aspergillus niger</i>	0.6	27.3	30.2	20.3	25.9
2	<i>Colletotrichum sp.</i>	0.6	25.3	26.7	37.0	29.6
3	<i>Dreschler avenaceum</i>	0.6	20.4	20.3	20.1	20.2
4	<i>Fusarium oxysporium</i>	0.6	30.1	29.9	28.3	29.4
5	<i>Trichoderma viride</i>	0.6	28.6	22.3	26.6	25.8

Expressed as: \*Mean of Triplication

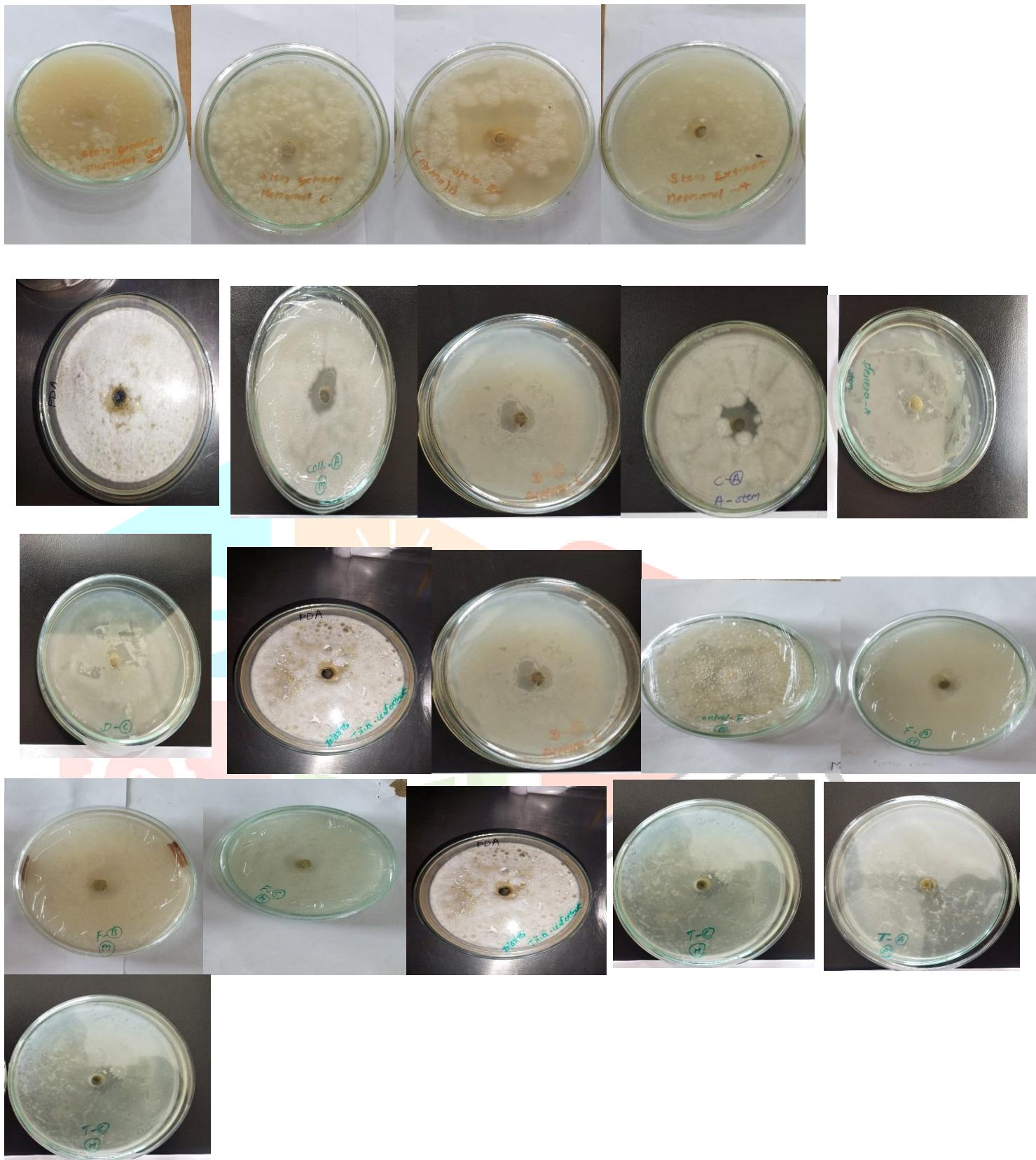
Table No. 2: Methanol stem extract of *Elaeagnus latifolia* L. against test fungi.

Sr. No.	Test Fungi	Zone of inhibition (Diameter in mm) Stem extract				
		Methanol control	1	2	3	Mean
1	<i>Aspergillus niger</i>	0.6	10.2	27	13.6	16.9
2	<i>Colletotrichum sp.</i>	0.6	13.8	12.5	10.5	12.2
3	<i>Dreschler avenaceum</i>	0.6	19.8	23.5	18.5	20.6
4	<i>Fusarium oxysporium</i>	0.6	20.1	23.4	20.4	21.3
5	<i>Trichoderma viride</i>	0.6	10.4	10.2	10.5	10.3

Expressed as: \*Mean of Triplication



### Methanol extract of *Elaeagnus latifolia* stem extract against test fungi



. 1.Leaf Extract against *Aspergillus Niger*, 2. Leaf Extract against *Colletotrichum sp.* 3. Leaf Extract against *Dreschlera avenaceum* 4. Leaf Extract against *Fusarium oxysporium* 5. Leaf Extract against *Trichoderma Viride*. First colour represents control petridishes