



THE ANTIMICROBIAL ACTIVITY OF *MIMOSA PUDICA* L.

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ABSTRACT

Mimosa pudica L. (Mimosaceae) is the herb that shows sensation on touch and it grows as weed in almost all parts of the country. It majorly possesses an antibacterial, antifungal, antioxidant, antiinflammatory, antiasthmatic, analgesic and antidepressant activities. In the present study, antimicrobial activity of *Mimosa pudica* was tested with various extracts such as petroleum ether, ethylacetate, acetone and aqueous against various human pathogenic bacteria such as *Escherichia coli*, *Pseudomonas aeruginosa*, *Lactobacillus*, *Salmonella typhi* and *Staphylococcus aureus* also with plant pathogenic fungus such as *Pestalotia foedians*, *Fusarium oxysporum* and *Paecilomyces variotii* at different concentrations. Out of the selected various solvent extracts, in bacterial study, acetone extract showed a maximum zone of inhibition against *Staphylococcus aureus*. In fungal study, ethyl acetate extract showed maximum zone of inhibition against *Fusarium oxysporum*.

KEYWORDS: *Mimosa pudica*, Antibacterial, Antifungal, Zone of inhibition.

INTRODUCTION

Mimosa pudica L. belongs to the family Mimosaceae. *Mimosa pudica* is a creeping annual or perennial herb often grown for its curiosity value, as the compound leaves fold inward and droop when touched and reopen within a minutes. *Mimosa pudica* is native to Brazil, but is now a pan tropical weed^[1]. It is derived from the word "mimic" means to sensitivity of leaves and "pudica" means bashful, retiring or shrinking. *Mimosa* mimics the animal sensitivity that is sensitivity to light, time of day, gravity or like *Sundew* which react to the contact of insects^[2]. So *mimosa* is known as sensitive plant, humble plant, shame plant, sleeping grass, touch me not, *Lajjalu* in Ayurveda and *Namaskari* in Sanskrit^[3]. It has reddish brown woody stems and pinkish flowers. It mainly contains tannins, steroids, triterpenes, alkaloids, glycosides, flavonoids, c-glycoside^[4]. This plant leaves and roots are used in the treatment of piles and fistula. And this plant is also used in the treatment of sore gum and is used as blood purifier^[5]. In Ayurvedic and Unani system of medicine, this plant has been used in disease arising from corrupted blood, bile, fever, piles, jaundice, leprosy, ulcers, and small pox.^[6] In

this present study, antimicrobial activity of *Mimosa pudica* against some microbes can be determined.

MATERIALS AND METHODS

Plant material

Mimosa pudica leaves were collected from the fields of Dharmapuri in Tamilnadu and it was identified by Dr. G. V. S. Murthy, Botanical Survey of India, Tamilnadu Agricultural University, Coimbatore.

Microorganisms

The microorganisms used for the study includes human pathogenic gram positive bacteria such as *Staphylococcus aureus* and *Lactobacillus*, gram negative bacteria such as *Escherichia coli*, *Salmonella typhi*, *Pseudomonas aeruginosa* and some plant pathogenic fungus such as *Pestalotia foedians*, *Fusarium oxysporum* and *Paecilomyces variotii*.

Preparation of Extracts

The freshly collected *Mimosa pudica* plant materials (leaves) was dried in shade, and coarsely powdered, 5g of the powder was extracted with acetone, ethylacetate, petroleum

ether and aqueous (50ml) were kept in an orbital shaker for 3 days at room temperature. After 3 days, the supernatant extract was discarded in a petriplate, and allowed to air dry. The dried extracts were diluted with dimethyl sulphoxide (DMSO) at 1mg/1ml concentration. The extracts was stored in refrigerator.

Antimicrobial Screening

All the extracts of *Mimosa pudica* were tested for antimicrobial activity against human pathogenic bacteria and plant pathogenic fungus. Muller Hinton agar media were used for bacterial growth, Oats media, Potato dextrose agar media and Zapek's media were used for fungal culture. The media were prepared and then autoclaved at 121°C for 15 minutes and were poured on petriplates and allowed to solidify.

RESULTS AND DISCUSSION

Table 1: Antibacterial Activity of *Mimosa Pudica L.*

S. No	Name of the Microorganisms	Concentration of Extracts µl/ml	Zone of Inhibition (MM)			
			Acetone	Ethyl Acetate	Petroleum Ether	Aqueous
1.	<i>ESCHERICHIA COLI</i>	30	13	11	10	17
		60	16	12	12	22
		90	18	14	18	15
		120	19	19	19	12
2.	<i>PSEUDOMONAS AEUROGIOSA</i>	30	9	11	9	9
		60	11	10	11	11
		90	14	15	14	14
		120	18	12	17	18
3.	<i>SALMONELLA TYPHI</i>	30	14	15	13	9
		60	16	16	17	12
		90	20	14	20	13
		120	21	18	21	15
4.	<i>LACTOBACILLUS</i>	30	13	12	8	7
		60	15	14	12	9
		90	18	14	13	12
		120	21	15	16	14
5.	<i>STAPHYLOCOCCUS AUREUS</i>	30	15	11	10	11
		60	19	12	12	13
		90	20	12	13	14
		120	24	13	15	17

The antibacterial and antifungal activity of the selected *Mimosa pudica* plants in terms of the diameter of zone of inhibition was shown in Table 1 and Table 2. In antibacterial study acetone extract showed a maximum zone of inhibition against *Staphylococcus aureus*, also aqueous extract showed a maximum zone of inhibition against *Escherichia coli* and petroleum ether showed a higher zone of

Well Diffusion Method

Well diffusion method is used to evaluate both antibacterial and antifungal activity^[8]. The prepared culture plates were inoculated with a selected strains of bacteria and fungus using spread plate method. The wells were made on the agar surface with sterile micro needles. The extracts were poured into the well using micropipette with the concentration of 30, 60, 90 and 120 µl/ml. The bacterial culture plates were incubated at 37°C for 24 hours and fungal culture plates were incubated at room temperature for 1 week. The zone of inhibition was calculated by measuring the diameter of the zone around the well (mm) including the well diameter.

inhibition for *Salmonella typhi*. In antifungal study, ethyl acetate showed a maximum zone of inhibition against *Fusariumoxysporum*, acetone extract showed a maximum zone of inhibition against *Paecilomycesvariotii* and petroleum ether showed a highest zone of inhibition in *Pestalotiafoedians*, *Fusariumoxysporum* and *Paecilomycesvariotii* shown in Graph (1) and Graph (2)

Table 2: Antifungal Activity of *Mimosa Pudica* L.

S. No	Name of the Microorganisms	Concentration of Extracts $\mu\text{L/ML}$	Zone of Inhibition (MM)			
			Acetone	Ethyl Acetate	Petroleum Ether	Aqueous
1.	<i>PESTALOTIA FOEDIANS</i>	30	12	10	9	10
		60	14	14	11	11
		90	16	18	17	13
		120	17	19	21	15
2.	<i>FUSARIUM OXYSPORUM</i>	30	8	18	13	13
		60	12	22	17	15
		90	14	23	19	19
		120	17	25	22	16
3.	<i>PAECILOMYCES VARIOTII</i>	30	17	11	9	14
		60	18	17	12	15
		90	21	20	16	16
		120	24	22	20	19

CONCLUSION

In the present study, *Mimosa pudica* leaf extracts possesses a strong antimicrobial activity against all tested microorganisms and the plant contains potential antimicrobial components for the therapy of infections. These local ethnomedical preparations and prescriptions of plant sources should be scientifically evaluated and then disseminated properly and the knowledge about the botanical preparation of traditional sources of medicinal plants can be extended for future investigation into the field of pharmacology, phytochemistry, ethnobotany and other biological actions for drug discovery.

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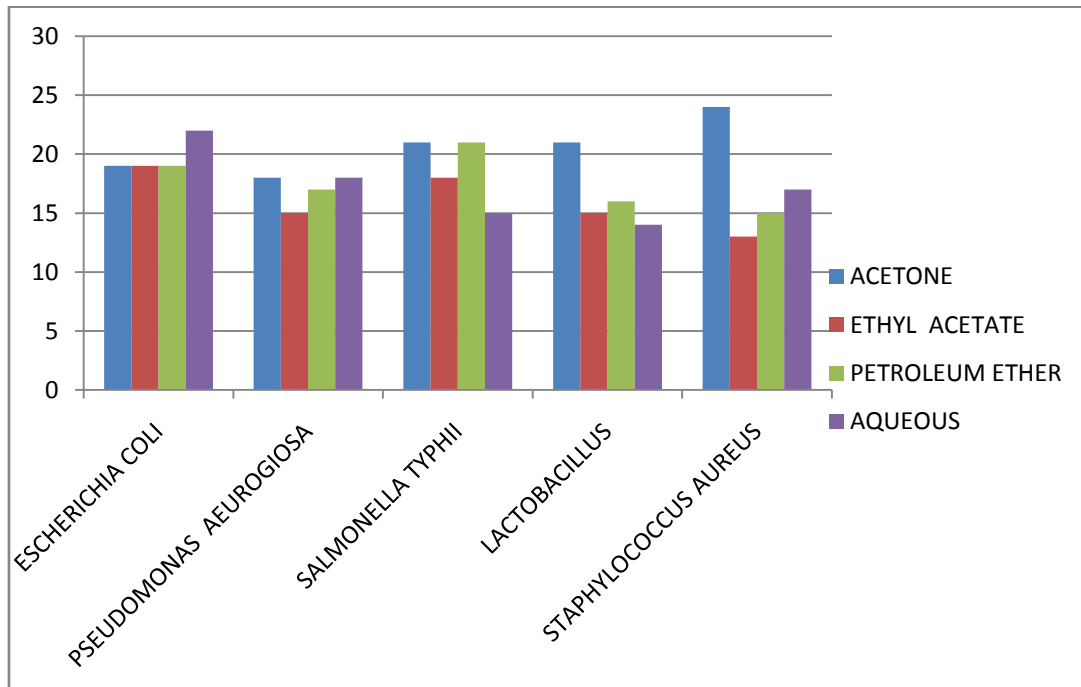
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Graph 1. Antibacterial Activity of *Mimosa Pudica*



Graph 2. Antifungal Activity of *Mimosa Pudica*

