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PHCOG MAG.: Short communication Antibacterial activity of *Mimosa pudica, Aegle marmelos* and *Sida cordifolia*

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ABSTRACT - The flora of Indian medicinal plants are potent source of bioactive principles. Anti-bacterial activity of *Mimosa pudica, Aegle marmelos* and *Sida cordifolia* were studied against *Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli* and *Salmonella typhi.* The maximum inhibitory zone of inhibition *Sida cordifolia* was against *Bacillus subtilis* (35mm) and *Salmonella typhi* (26 mm). *Mimosa pudica* and *Aegle marmelos* were found to be active against all the microorganisms tested and the maximum activity was noted against *Pseudomonas aeruginosa* and *Salmonella typhi* respectively.

KEY WORDS- Anti-bacterial activity, *Mimosa pudica, Aegle marmelos* and *Sida cordifolia*.

INTRODUCTION

Plants have been the traditional source of raw materials for medicines. A rich heritage of knowledge on preventive and curative medicines was available in ancient scholastic work included in the Atharva veda, Charaka, Sushruta, etc. An estimate suggests that about 13,000 plant species worldwide are known to have use as drugs. The trend of using natural products has increased and the active plant extracts are frequently screened for new drug discoveries and for the presence of antimicrobials (1).

The present article deals with the screening of plants *Mimosa pudica, Aegle marmelos* and *Sida cordifolia* for their anti bacterial activity against various micro organisms. The Plant *Mimosa pudica* belongs to family Mimosaceae, commonly called "Sensitive plant" in English and locally known as Thottasiningi. Leaves are sensitive, alternate, bipinnate, digitate, stipulate, petioles are 2.5-5 cm long, lanceolate and acute. Leaves are used in the treatment of inflammation, hydrocele, piles and bitter tonic (2).

Aegle marmelos belongs to family Rutaceae, commonly known as bael (Hindi), Kuvalam (Tamil) and golden apple (English). It grows in the Indian forests (upto 100 meters altitude), Ceylon, Burma, Thailand and Indo-China. The leaf part of the plants have been claimed to be used for the treatment of inflammation, asthma, hypoglycemia, febrifuge, hepatitis and analgesic(2).

Sida cordifolia belongs to family Malvaceae, commonly known as Bala (Hindi), country mallow in (English), grows in the tropical and sub-tropical regions of the world and all over India (3). *Sida Cordifolia* is shruby, branched, softly hairy and stellate nearly all over and sub persistent. Leaves are 2.5-5.0 cm long, cordate, ovate-oblong, crenate, obtuse or subacute, not acuminate, Petioles 1.2-3.8 cm long. The plant has medicinal value like astringent, emollient, aphrodisiac, healing of wounds, diuretic and febrifuge (4).

MATERIALS AND METHODS

Plant material:

The Leaves of *Mimosa pudica, Aegle marmelos* and *Sida cordifolia* were collected from Madurai district, Tamil Nadu, India in March 2003 and authenticated by Dr.D. Stephen, and a voucher specimen (VMCOP/ 4B-36,37 & 38 (20037) has been retained in our laboratory for further reference.

Preparation of extract

All the three leaves were dried (under shade), powdered and passed through 40 mesh sieve and stored in closed vessel for further use. The dried

powdered leaves (500g) were extracted with hydro-alcohol in a soxhlet apparatus for 9 hrs separately. Solvents were removed from all the three extracts under vacuum and a semisolid mass was obtained. The extracts were stored in a refrigerator.

Formulation of extract

From each extract 300 mg was dissolved in 10 ml of dimethyl sulfoxide and stored in air tight containers.

Anti-bacterial activity (5)

Paper discs of 6mm in diameter were taken and were made to absorb 0.1 ml (3 mg) of the test samples. Known quantity of standard reference antibiotic (chloramphenicol 30µg) was used for comparison of the anti-bacterial activity of the sample. Blank paper disc impregnated with dimethyl sulfoxide were also used. The organisms used for anti-bacterial activity were *Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli* and *Salmonella typhi*. The anti-bacterial sensitivity patterns for the extracts were studied by disc diffusion method using the samples, reference and blank discs. The inhibition zones formed by the test samples were measured.

RESULTS AND DISCUSSION

Hydroalcholic extracts had activity against all the species namely, *Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli* and *Salmonella typhi*. The hydroalcoholic extract of *Sida cordifolia* produced antibacterial activities against both gram positive and gram negative bacteria, showed maximum inhibitory zone of *Sida cordifolia* was against *Bacillus subtilis* (35 mm) and *Salmonella typhi* (26 mm). The maximum activity was noted in *Aegle marmelos* against *Salmonella typhi* and in *Mimosa pudica* against *Pseudomonas aeruginosa.* The results of this study support the use of these plants for human and animal disease therapy and reinforce the importance of the ethnobotanical approach as a potential sources of bioactive substances.

Table No 1 - Antibacterial activity of the leaves of Mimosa pudica, Aegle marmelos and Sida cordifolia against bacterial pathogens by disc diffusion method.

Sl.No	*Microorganism*	*Hydroalcoholic extract**			
		Chl (mm)	*1*	*2*	*3*
1	*Bacillus subtilis*	27	0.48	0.81	1.3
2	*Staphylococcus aureus*	25	0.77	0.8	0.72
3	*Klabsiella pneumoniae*	30	0.47	0.83	0.77
4	*Pseudomonas aeruginosa*	23	0.91	0.83	0.65
5	*Escherichia coli*	22	0.68	0.68	0.82
6	*Salmonella typhi*	22	0.77	0.91	1.2

1, Mimosa pudica ; 2, Aegle marmelos; 3, Sida cordifolia ; Chl-Chloramphenicol.

** Ratio of the diameter of the inhibition zone of plant extract disc to the inhibition zone of the reference activity disc.*

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