

## Research Paper

**Microbiological Potentiality of *Ipomoea sepiaria* Roxb (Convolvulaceae)**

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**ABSTRACT**

Antimicrobial activity of various extracts of leaves of *Ipomoea sepiaria* was tested on Gram-positive, Gram-negative bacteria and various fungus strain using zone of inhibition. The bacteria used in the test were *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa* and the fungus were *Candida albicans*, *Kluyviomyces mandamus* and *Cryptococcus neoformans*. The antibacterial and antifungal activity of various extracts compared with standard drug (Ciprofloxacin and Clotrimazole). All extracts showed good antimicrobial activity.

**Key Words:** *Ipomoea sepiaria*, Antimicrobial activity, Antifungal activity.

**INTRODUCTION**

*Ipomoea sepiaria*<sup>1</sup> grows as A slender twining perennial with usually villous stems and lightly tuberous roots; leaves, simple, alternate, petiolate, ovate-cordate with a wide sinus and rounded basal lobes, blocked With brownish or purplish patches towards the center; flowers pale purple or pink, large, funnel shaped innum15ellate or subumbellate axillary cymes; fruits void casuals, 8 mm long, 4 or 2-seeds grey covered with silky pubescence.

The preliminary phytochemical studies reveal the presence of fatty acid, flavonoids steroids, terpenoids, phenolic acid, and epoxy. The present study was undertaken to demonstrate the antimicrobial activity.

**MATERIALS AND METHODS**

The leaves of *Ipomoea sepiaria* were collected from Sambalpur in the month of October. It was identified and authenticated by Dr. (Mrs) Uma Devi, HOD of Botany Dept., Govt. Women's College, Sambalpur, Orissa, having authenticated voucher no GWC/B-315/09 and voucher specimens deposited there. The leaves of the plant were used for the present study. The following microorganisms were used for the experiment *Staphylococcus aureus* (Sa), *Klebsiella pneumoniae* (Kp), *Escherichia coli* (Ec) and *Pseudomonas aeruginosa* (Pa) Fungi used: *Candida albicans* (Ca), *Kluyviomyces mamlamus* (Km) and *Cryptococcus neoformans* (Cn). Nutrientagar (NA)

**Preparation of Plant Extract**

Freshly collected leaves were cleaned, dried in shade and ground into fine powder. The coarse dried powder was extracted successively in Soxhlet

apparatus with Hexane (HN), Chloroform (CL), Ethanol (ET), and Purified water (AQ). The extracts were evaporated by Rota evaporator to dryness. All the extracts were studied for antibacterial and antifungal activity by disc diffusion method.

**Initial Screening for Antimicrobial Activity**

Initial screening was done for antimicrobial activity by agar cup method. The results were read by zone of inhibition showing antimicrobial activity.

**Macro-dilution Technique for MIC Determination**

1000 mcg/ml solution of each extract was prepared by dissolving in 6% DMF solution and by two fold serial dilution method a range of eight solutions from 7.8 to 1000 µg/ml was prepared using solvent. 0.5 ml each of above solutions was taken in test tubes. 0.5 ml of respective sterile broth was added to each followed by inoculation using 50µl of overnight respective broth culture of bacteria and yeast type fungus, inoculation was done by putting a 6mm diameter fungal disc in above test tube which was obtained from the culture of respective fungi on SDA plate. One test tube containing the inoculated broth with solvent as positive control and one without inoculation as negative control were used. All test tubes were incubated at 37°C for 24 hours for bacteria and at 27°C C for 72hours for fungi. The test tubes were observed for appearance of turbidity in comparison to both positive and negative controls. The minimum concentration showing no turbidity was considered as MIC.

**Disc Diffusion Method for Determination of Zone of Inhibition**

A comparison of all the extracts was done with the standards in terms of zone of inhibition. 100mg/ml

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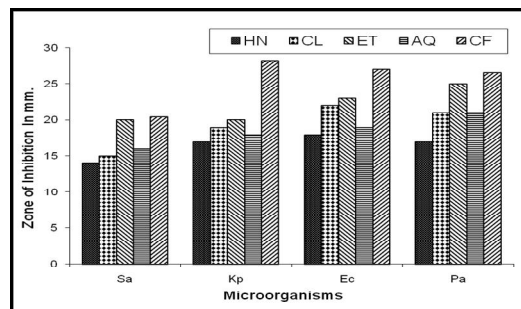
solutions of respective extracts were prepared using 6% DMF. Paper disc of 6mm diameter (Whatman No.1). Were sterilized, impregnated with 10 $\mu$ l (100 $\mu$ g/disc) of 6% DMF solution of extracts, were dried and placed on the surface of inoculated Petri plates (for bacteria NA plates and for fungi SDA plates were prepared and sterilized. The plates were inoculated using corresponding broth cultures of bacteria and fungi) and pressed down gently to ensure even contact. Disc of standards (HiMedia, Mumbai) such as Ciprofloxacin (CF) 10 $\mu$ g for bacteria and 10mcg of Clotrimazole (CT) for fungi were similarly placed on respective plates. The plates were kept in refrigerator for 2hour to allow diffusion followed by incubation at 37°C for 24 hour for bacteria and at 27°C C for 72hours for fungi. Diameter of zone of inhibition was measured. All above tests were carried out in aseptic environment and in triplicate and average values were recorded

## RESULTS AND DISCUSSION

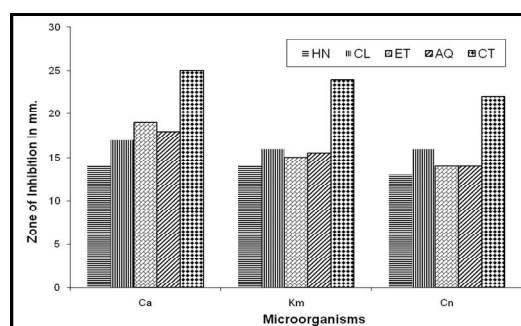
The results of the study indicate the presence of antimicrobial properties of various extracts of leaf of *Ipomoea sepiaria*. The organisms tested for antimicrobial activity under initial screening, appeared to be susceptible to all extracts. While comparing the zone of inhibition (Table 1) with the standard (Ciprofloxacin, 10mcg) the ethanolic extract showed 20-25 mm zone of inhibition against all bacteria with highest inhibition against *Pseudomonas aeruginosa* (25) and *Escherichia coli* (23). Ciprofloxacin showed 24.5-28.3 mm zone of inhibition. So the ethanolic extract showed maximum antibacterial activity. Similarly with standard {Clotrimazole, 10mcg) the ethanolic extract showed 14-19 mm zone of inhibition against all fungi with highest inhibition against *Candida albicans* (19).

**Table 1: Zone of Inhibition of various Extracts of *Ipomoea sepiaria* and Standards**

Extract 1 $\mu$ g/disc	Micro-organism (Zone of inhibition in mm)						
	Bacteria				Fungi		
	Sa	Kp	Ec	Pa	Ca	Km	Cn
HN	14	17	18	17	14	14	13
CL	15	19	22	21	17	16	16
ET	20	20	23	25	19	15	14
AQ	16	18	19	21	18	15.5	14
CF	20.4	28.3	27	26.6	NT		
CT	NT				25	24	22



**Fig. 1: Comparison of Zone of Inhibition of *Ipomoea Sepiaria* Roxb Extract with Standard Drug (Ciprofloxacin) Against Selected Microorganisms (Bacteria)**



**Fig. 2: Comparison of Zone Of Inhibition of *Ipomoea Sepiaria* Roxb Extract with Standard Drug (Clotrimazol) Against Selected Microorganisms (Fungi)**

## CONCLUSION

The Ethanolic extracts of leaf of *Ipomoea sepiaria* shows very good antibacterial activity. Further studies of different extracts needed to evaluate the same activity.

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