

## EVALUATION OF THE ANTI-BACTERIAL AND ANTI-FUNGAL ACTIVITY OF IPOMOEA HEDERACEA

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### Article Info

Received 29/02/2015

Revised 16/03/2015

Accepted 19/04/2015

### Keywords :-

Antifungal,  
Antibacterial, *Ipomoea hederacea*.

### ABSTRACT

In the present scenario, antimicrobial resistance is a major problem in the treatment of Infections. Hence the search for an Ideal anti -microbial continues in the plant kingdom. Plants have always been a rich source of antimicrobials: turmeric, and tulsi to name a few. Several *Ipomoea* species have been found to possess antimicrobial properties. The purpose of the present study is to evaluate the antibacterial and antifungal activities of the hydro alcoholic extract (70% alcohol in water) of its Aerial parts of one such species, *Ipomoea hederacea* (Ivy leaf morning glory) by determination of the zone of inhibition by the cup plate method. It was found that *Ipomoea hederacea* (IPO) exhibited moderately significant antifungal activities against *Candida albicans*, *Aspergillus niger*, *Aspergillus oryzae*, *Penicillium chrysogenum* and, antibacterial activity against both gram positive bacteria, that is, Gram Positive bacteria -*Staphylococcus aureus*, *Bacillus subtilis* Gram Negative bacteria- *Proteus vulgaris*, *Escherichia coli*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, as compared to that of the standard.

### INTRODUCTION

In the present scenario, antimicrobial resistance is a major problem in the treatment of Infections. As the media would phrase it, the "SUPER BUG" seems to be invincible. In spite of several million dollars spent, the new age antibiotics have been found to be ineffective in eradicating the microbes. Plants have always been a rich source of antimicrobials: turmeric, and tulsi to name a few. Hence the search for an Ideal anti -microbial continues in the plant kingdom [1]. *Ipomoea* species *F: Convolvulaceae* (morning glory, sweet potato) occurs throughout the tropical and subtropical regions of the world [2,3]. Several species of *Ipomoea* have been reported to possess antimicrobial activity (*Ipomoea batatas*, *Ipomoea indica*). One such species, is *Ipomoea hederacea* (Ivy leaf morning glory) a climbing vine naturalised and runs wild throughout India, whose antimicrobial potential remains unexplored [4,5].

The purpose of the present study is to evaluate the antibacterial and antifungal activities of the hydro alcoholic extract (70% alcohol in water) of its aerial parts by determination of the zone of inhibition by the cup plate method.

### MATERIALS AND METHODS

**Collection of the Plant material:** The fresh leaves of the plant were collected from Araku valley Paderu region, Vishakhapatnam district of Andhra Pradesh, India.

**Preparation of the Extract:** The plant material was dried in shade, powdered, subjected to Soxhlet extraction using 70% ethanol in water for 72 hours. The extract was evaporated to dryness on a water bath. The plant material was identified by Dr.M.Venkaiiah, Professor of Botany, Andhra University, Visakhapatnam. A Herbarium was prepared and a voucher specimen of the same, bearing no 21108 was deposited in the A.U. (B.D.H).

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Research Article



### Evaluation of Anti- Microbial Activity [6]

The evaluation was carried out by determination of the zone of inhibition by cup plate method, summarized as follows

	Antibacterial Activity	Antifungal activity
Medium used	Nutrient agar	Sabouraud's dextrose agar
Test organisms	: Gram Positive bacteria - <i>Staphylococcus aureus</i> , <i>Bacillus subtilis</i> . Gram Negative bacteria- <i>Proteus vulgaris</i> , <i>Escherichia coli</i> , <i>Klebsiella pneumonia</i> , <i>Pseudomonas aeruginosa</i>	Fungal strains: <i>Candida albicans</i> , <i>Aspergillus niger</i> , <i>Aspergillus oryzae</i> , <i>Penicillium chrysogenum</i>
standard	Amikacin (0.01mg/ml)	Fluconazole (0.01mg/ml)
vehicle	Ethyl acetate	Ethyl acetate
Bore size	6mm	6mm
Incubation temperature	37degree centigrade	37degree centigrade
Incubation time	24 hours	48 hours

### RESULTS

Table 1. Anti -bacterial activity of *Ipomoea hederacea*(IPO)

Sample	Con- mg/ml	Zones of Inhibition(diameter in mm)					
		Gram positive			Gram negative		
		<i>S. aureus</i>	<i>B.subtilis</i>	<i>P.vulgaris</i>	<i>E.coli</i>	<i>K.pneumoniae</i>	<i>P. aeruginosa</i>
IPO100	100	24	26	22	20	23	27
IPO200	200	26	25	20	24	24	22
IPO300	300	27	27	26	25	27	24
Amikacin	0.01	45	45	42	42	42	42
Ethyl Acetate		-	-	-	-	-	-

Figure 1. Anti -bacterial properties of *Ipomoea hederacea* (IPO)

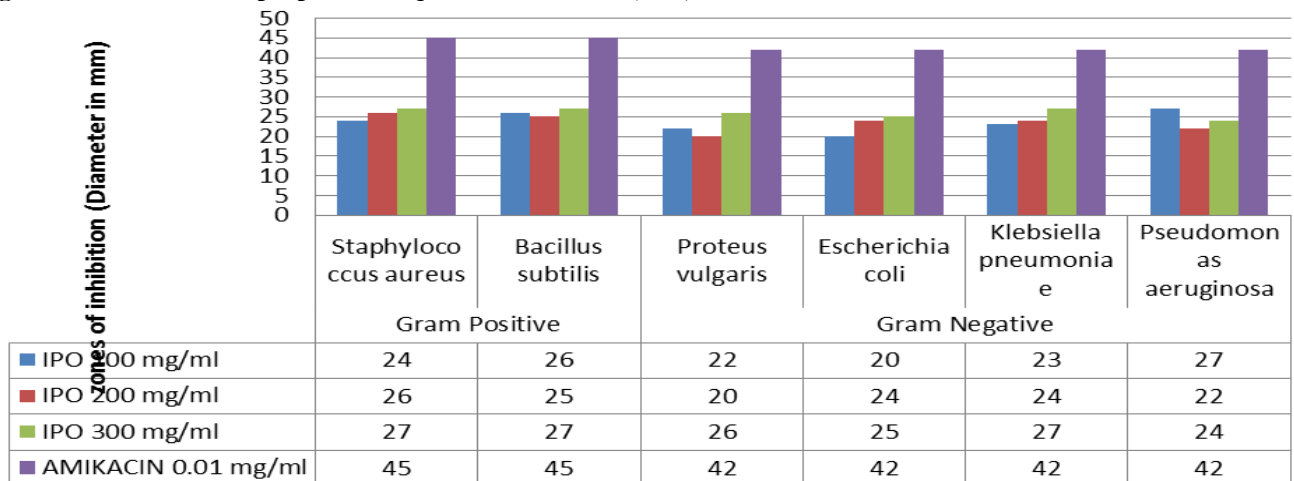
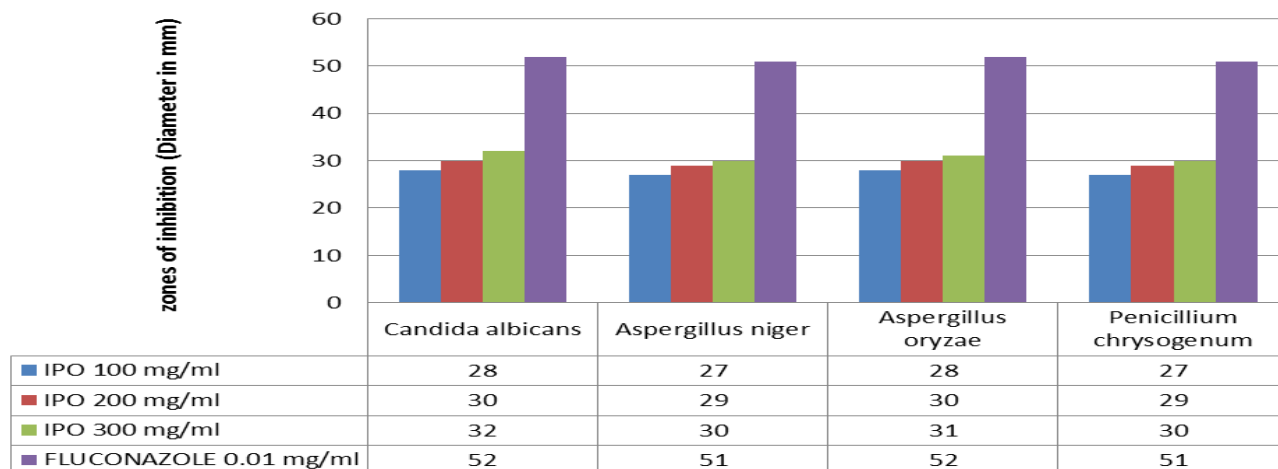


Table 2. Antifungal activity of *Ipomoea hederacea* (IPO)

Sample	Con mg/ml	Zones of Inhibition(diameter in mm)			
		<i>Candida albicans</i>	<i>Aspergillus niger</i>	<i>Aspergillus oryzae</i>	<i>Penicillium chrysogenum</i>
IPO100	100	28	27	28	27
IPO200	200	30	29	30	29
IPO300	300	32	30	31	30
Fluconazole	0.01	52	51	52	51
ethyl acetate		-	-	-	-



**Figure 2. Antifungal activity of *Ipomoea hederacea* (IPO)****CONCLUSION**

From the above results, it can be concluded that the hydro alcoholic extract (70% alcohol in water) of the dried aerial parts of *Ipomoea hederacea* exhibited significant antifungal as well as antibacterial activity against both gram positive and gram negative bacteria, in a dose dependent manner as compared to that of the standard.

**DISCUSSION**

The plant *Ipomoea hederacea* may be further explored for the antimicrobial activity against antibiotic resistant strains of microbes which may hold promise in the fight against the SUPER BUG.

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