



# INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND DEVELOPMENT (IJPRD)

Platform for Pharmaceutical Researches & Innovative Ideas

[www.ijprd.com](http://www.ijprd.com)

## EVALUATION OF PRELIMINARY PHYTOCHEMICAL PROPERTIES AND ANTIBACTERIAL ACTIVITY OF THE EXTRACT OF *MUSA ROSACEA*

Srikanth.M<sup>1\*</sup>, Ganga Rao.B<sup>1</sup>

<sup>1</sup>A.U College of Pharmaceutical Sciences, Andhra University, Visakhapatnam 530 003.

### ABSTRACT

The plant *Musa rosacea* belongs to the family, *Musaceae* grows in certain moist regions. The plant was collected from Katika waterfalls near Aruku Valley, Andhra Pradesh, India. In the present study we have investigated antibacterial activity and preliminary phytochemical screening of ethanolic extract of *Musa rosacea*. Six bacterial strains; three gram positive (*Bacillus megaterium*, *Staphylococcus epidermidis* and *Lactobacillus acidophilus*) and three gram negative (*Escherichia coli*, *Salmonella typhi* and *Klebsiella pneumonia*) were tested for antibacterial activity. The preliminary phytochemical screening showed the presence of compounds like steroids, terpenoids, alkaloids, glycoside, amino acids and carbohydrates. The results of antimicrobial activity suggested that the extract possessed the activity significantly against all bacterial strains compared to Rifampicin, a standard anti-bacterial drug.

**Keywords:** *Musa rosacea*, Preliminary phytochemical screening and antibacterial activity.

### Correspondence to Author



Srikanth.M

C/o. Prof. B. Ganga Rao A.U. College of Pharmaceutical Sciences Andhra University, Viskahpatnam-530003

**Email:** [srikanthmuppaneni@gmail.com](mailto:srikanthmuppaneni@gmail.com)

### INTRODUCTION

India is Botanical Garden of the world and one of the leading biodiversity centers which contain different plant species, out of this some species are with medicinal properties of which only about few are being used by traditional practitioners. Present in the world herbal medicinal industry is more lucrative. The Siddha, Ayurveda, Unani and modern medicine systems uses medicinal plant species. Herbal technology is India's biggest revenue source <sup>[1]</sup>. Now a day's herbal medicine is effective in treatment of various

ailments, very often these drugs are not scientifically exploited or improperly used. Therefore, these plant drugs deserve detailed studies in the light of modern science.

Numerous studies have shown that medicinal plants are sources of diverse nutrient and non nutrient molecules, many of which display antimicrobial properties which can protect the human body against pathogens <sup>[2-4]</sup>. Medicinal plants are known to produce certain bioactive molecules which inhibiting bacterial or fungal growth (antimicrobial activity) <sup>[5-7]</sup>.

A detailed investigation and documentation of plants used in local health traditions and pharmacological evaluation of these plants and their taxonomical relatives can lead to the development of invaluable plant drugs for many dreadful diseases. Now, in present study we have extracted dried plant *Musa rosacea* in ethanol (70%v/v). These extracts were checked out for their phytochemical screening and In-vitro antibacterial activity. The extracts were found to be potent antibacterial activity.

## MATERIAL AND METHODS

### Collection and Preparation of Extract

For screening of phytochemical constituents and antibacterial activity of *Musa rosacea* was collected from Katika waterfalls, Aruku valley, Visakhapatnam District, Andhra Pradesh, India in the month of December and were identified by Taxonomical expert, Department of Botany, Andhra University. The collected Plant was washed with distilled water and then shade dried at room temperature for 10 days. The shade dried Plant material was pulverized into coarse powder and extracted by maceration process by using ethanol (70%) solvent. The extract was filtered and concentrated to crude extract in a rotary vacuum evaporator (Buchi) at 40°C. Then the extract was subjected to preliminary phytochemical screening and tested for antibacterial activity.

### Test organisms used

To testing antibacterial activity of selected algae six bacterial species were selected and they were collected from National Collection of Industrial Micro-Organisms (NCIM), Pune, India. The bacterial species were maintained in nutrient broth medium placing on shaker in separate culture tubes for each species. Out of six three are gram positive bacteria (*Bacillus megaterium*, *Staphylococcus epidermidis*, *Lactobacillus acidophilus*) and three are gram negative (*Escherichia coli*, *Salmonella typhi*, *Klebsiella pneumoniae*).

### Culture media

For Anti bacterial activity the selected bacterial species were maintained with Muller-Hinton Agar media (Solid and Broth).

### Phyto-chemical Screening

Phyto-chemical constituent's analysis was carried out qualitatively for the presence of steroids, terpenoids, tannins, flavanoids, saponins, phenols, alkaloids, carbohydrates, glycosides, oils, amino acids etc following the described procedures [8-10].

### Anti-Bacterial Activity

The extract of *Musa rosacea* was tested by using cup plate method for antibacterial activity. Different concentrations of the extracts were prepared by reconstituting with dimethyl sulphoxide (DMSO). The prepared Muller-Hinton Agar medium was heated at 45°C to get liquid state. The Muller-Hinton Agar (MHA) medium was cooled at room temperature. Then, 20ml of Muller-Hinton Agar medium is taken in the eight test tubes, to those test tubes subjected to testing bacterial inoculums (20µl). After adding inoculums to the test tubes were mixed well for equal distribution of Bacterial species in the MHA medium. After proper mixing, the medium was poured into the autoclaved Petri dishes. These Petri dishes were placed in undisturbed condition for solidifying the medium. After solidification of the medium wells (4mm) were prepared by using metal steel borer. Different concentrations of algal extract were placed in the wells of solidified Petri dishes. Then plates were incubated in incubator for 24hrs at 36°C. After incubation the zones of inhibitions were measured in mm.

## RESULT AND DISCUSSION

Many studies were reported on different biological activities of plant extracts from different regions around the world. Earlier many studies were reported on the presence of different bio-active compounds and their antibacterial activity of plants [11-14]. The tested *Musa rosacea* plant extract gave positive results for different phytochemical constituents like steroids, alkaloids, terpenoids, glycosides, phenols and flavonoids but gave

negative results for amino acids and oils. The presence or absences of different chemical constituents in extracts were responsible for different biological activities. In this background, *Musa rosacea* plant extract tested for their antibacterial activity. The extract showed good antibacterial activity (zone of inhibition) against tested bacterial species. The results of anti bacterial activity and phytochemical constituents screening of three algae were showed in Tables 1 and 2. The results obtained in this present study

supports that the plants contain biological active compounds with effective in resisting the growth of the pathogenic bacteria. The extract showed concentration dependent antibacterial activity same against both gram positive and negative organisms. The medicinal plants are best owed with large number of pharmaceutically useful compounds which can be studying for investigation of new drugs for many serious diseases like cancer, tumors, AIDS, and many human degenerative diseases.

**Table 1:** Phytochemical constituents present in different extracts of ethanol (70%) extract of *Musa rosacea*

compounds	Ethanollic extract of <i>Musa rosacea</i>
Phytosterols	+
Terpinoids	+
Glycosides	+
Saponins	-
Flavonoids	+
Tannins	+
Carbohydrates	+
Alkaloids	+
Amino acids	-
Oils	-
Phenols	+

+ = Present, - = Absent

**Table 2:** Antibacterial Activity of *Musa rosacea*

Sl.No.	Name of Organism	Zone of inhibition in mm				
		Positive Control (Rifampicin) 50µg/100 µl	50µg/100µl	100µg/100µl	150µg/100µl	200µg/100µl
1	<i>Bacillus megaterium</i>	12	6	9	12	15
2	<i>Staphylococcus epidermidis</i>	16	5	8	11	14
3	<i>Lactobacillus acidophilus</i>	12	7	10	12	16
4	<i>Escherishia coli</i>	12	6	10	13	17
5	<i>Salmonella typhi</i>	14	6	9	11	14
6	<i>Klebsilla pneumonia</i>	22	5	8	12	15

## CONCLUSION

*Musa rosacea* plant extract showed satisfactory antibacterial activity (zone of inhibition) against tested bacterial organisms. The results obtained in the present study supports the plants contain biological active compounds with effective in resisting the growth of the bacteria.

## ACKNOWLEDGEMENTS

Authors are grateful to the A.U. College of Pharmacy, Andhra University, Visakhapatnam for their help during our work.

## REFERENCES

1. Sharma A, Shanker C, Tyagi L, Singh M, Rao CV. 2008. Herbal medicine for market potential in India: An Overview. *Academic Journal of Plant Sciences*.1(2): 26-36.
2. Gupta K C, Viswanathan R 1956. Antituberculous substances from plants. *Antibiot and chemother*. 6:194-5.
3. Singh P k, Roy S, Dev S. 2008. Antimicrobial activity of *Andrographis paniculata*. *Fitoterapia* 74: 692-694.
4. Manjusha G.V, Rajathi K, J.K Mini Alphonse, Meera K.S, 2011. Antioxidant Potential and Antimicrobial activity of *Andrographis paniculata* and *Tinospora Cordifolia* against pathogenic organisms. *Journal of Pharmacy Research*. 4(2):452-455.
5. Sharma, B. and P. Kamar. 2009. In vitro antifungal potency of some plant extracts against *Fusarium oxysporum*. *Int. J. G. Pharmacy*, 3(1): 63-65.
6. Mothana, R.A.A. and U. Lindequist. 2005. Antimicrobial activity of some medicinal plants of the island Soqotra. *J. Ethnopharmacol*. 96: 177-181.
7. F. C. Gerretsen & Netty haagsma. 1951. *Brassica oleracea* and *Beta vulgaris*. *Letters to Nature (London)*. 168-659.
8. Faraz M, Mohammad K, Naysaneh G, Hamid RV. 2003. Phytochemical screening of 8 some species of Iranian plants, *Iranian J of Pharmaceutical Research*. 77-82.
9. Harborne B. 1998. *Phytochemical Methods: A Guide to Modern Techniques of Plants Analysis*, 3<sup>rd</sup> Edition. Chapman & Hall, London, England.
10. Edeoga HO, Okwu DE, Mbaebre BO. 2005. Phytochemical constituent of some Nigerian Medicinal Plants. *Afr.J. Biotechnol*. 4 (7): 685-688.
11. Bennett, R.N., and Wallsgrave, R.M. 1994. Secondary metabolites in plant defense mechanisms. *New Phytol*. 127: 617-633.
12. Marjorie Murphy Cowan, 1999. Plant Products as Antimicrobial agents. *Clin Microbiol Rev*. 12(4): 564-582.
13. VanEtten, H.D., Mansfield, J.W., Bailey, J.A., and Farmer, E.E. 1994. Two classes of plant antibiotics: Phytoalexins versus "phytoanticipins.". *Plant Cell*. 6: 1191-1192.

\*\*\*\*\*