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## Antibacterial Studies on the Flowers of *Urticularia reticulata*

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### ABSTRACT

The antibacterial properties of the *Urticularia reticulata* flowers were tested against ten human pathogens by using four different solvents namely, chloroform, ethyl acetate, acetone and methanol. The maximum antibacterial activity recorded in methanol extracts against *Vibrio cholerae* and *Staphylococcus aureus*. Minimum activity was noted in chloroform extracts against *Pseudomonas aeruginosa*, no inhibition zone present in chloroform extract against *Escherichia coli*.

**Keywords:** *Urticularia reticulata*, Anti bacterial activity, Dimethyl Sulphoxide, Disc-diffusion method.

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## INTRODUCTION

Plants are valuable source of the therapeutic agents in the armory of modern medicine. The method of drug development from plant sources is based on a sequence of operation leading mainly towards the isolation of pure natural products. The use of modern isolation technique and pharmacological testing procedure means that new plant drugs may find their way in to medicine as purified substances rather than in the form of galenical preparations. Herbs play a significant role in modern times when the damaging effects of food processing and over medication have assumed alarming proportion. The skill of herbalist is to use their benefits to balance and strengthen the body's own healing mechanism instead of suppressing or disturbing it as many modern drugs tend to do. Herbs are now being used in cosmetics, food, as well as alternative medicine. while most herbs have little or no harmful side effects, some herb may cause slightly undesirable actions in some persons. Pharmacognostic investigations of plants are carried out to find novel drugs or templates for the development of new therapeutic agents [1].

## MATERIALS AND METHODS

### *Source of Plant*

Matured flowers of *Utricularia reticulata* were collected from the hilly areas of Madaippara, Pazhayangadi, Kannur District, Kerala State, south India in the month of October-November 2012 . It was then shade dried and its botanical identity was confirmed and the specimen of bearing voucher no. UR (Flwr.) 01 has been deposited in the Department of Pharmacognosy, Academy of Pharmaceutical Sciences, Pariyaram Medical College, Kannur District, Kerala State, South India.

### *Preparation of Plant Extract*

The shade dried coarsely powdered flowers were subjected to cold extraction using chloroform, ethyl acetate, acetone and methanol, After 10-15 days the mixture was filtered through Whatman No 1 filter paper. The extract was used for antibacterial activity.

### *Bacterial Stains*

The test organisms were supplied by the department of Microbiology, Pariyaram Medical College and also from the department of Microbiology, Academy of Pharmaceutical Sciences, Pariyaram. Two Gram-positive (*Enterococcus faecalis* and *Staphylococcus aureus*) and eight Gram negative (*Escherchia coli*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Salmonella paratyphi*, *Shigella boydii* and *Vibrio cholera*) bacterial stains were used in the evaluation. The organisms were sub cultured on Muller Hinton Agar medium and incubated at 37<sup>0</sup> C for 24 hrs. and stored at 4<sup>0</sup>C in the refrigeration to maintain stock culture.<sup>4</sup>

### Antibacterial Assay

The assay was carried out by using Disc diffusion method. Plates were prepared by using 20ml of sterile Muller Hinton Agar. The tested cultures were applied on top of the solidified media and allowed to dry for 15 minutes. The concentrated crude flower extract was dissolved in Dimethyl sulphoxide. The test was conducted at three different concentration of the crude extract like 25, 50 and 75 micro liter per disc with three replicates. The loading disc were placed on the surface of the medium and left for 30minutes at room temperature for compound diffusion. Zone of inhibition was recorded in millimeters and the experiment was repeated in three replicates [2].

### RESULTS AND DISCUSSION

*Urticularia reticulata* is endemic to India and Sri Lanka. Large populations are seen on open rocky waterlogged areas and in secondary habitats such as irrigated fields. It has large area of occupancy and extent of occurrence and although biotic pressures are leading to habitat degradation, the species is still seen throughout the range in large numbers. Ongoing decline in the population is inferred due to habitat loss and it will continue to occur as the pressures will not reduce. However, the large populations, large area of occupancy and extent of occurrence are well above the critical limits. The species is therefore listed as Least Concern.

The medicinal properties and pharmacological actions of *Urticularia reticulata* is well documented and utilized in Indian traditional medicine. This plant is known to contain various active principles of therapeutic value and to possess biological activity against many diseases.<sup>3</sup> The extract of *Urticularia reticulata* inhibited *Staphylococcus aureus* and *Pseudomonas aeruginosa* at concentrations of 100 and 200 micro grams per milli litre respectively. Methanol extract was effective against the organism *Staphylococcus aureus*. In the present study, ethyl acetate, acetone and methanol extracts were showed significant zone of inhibition against *Enterococcus faecalis*, *Salmonella paratyphi* and *Shigella boydii* but other Gram-negative bacteria were less inhibited. The results were also showed that the crude drug extract tested possess a remarkable antibacterial action against the Gram-positive bacteria. While comparing the four extracts which were tested at three different doses the ethanol, acetone and ethyl acetate extracts at 75micro liter per disc dose were more potent in their anti bacterial property. (Table -1)

**Table – 1 Antibacterial activity of *Urticularia reticulata***

Microorganisms	Control	Chloroform			Ethyl acetatae			Acetone			Methanol		
		A	B	C	A	B	C	A	B	C	A	B	C
<i>Vibrio cholera</i>	---	---	17	14	11	16	17	15	18	18	17	17	19
<i>Enterococcus faecalis</i>	---	---	---	---	13	14	14	14	14	14	14	14	18
<i>Staphylococcus aureus</i>	---	9	---	---	12	14	16	15	15	18	15	16	19
<i>Salmonella typhii</i>	---	11	---	---	---	13	---	---	13	13	---	12	13
<i>Salmonella paratyphi</i>	---	---	9	9	12	13	13	13	14	15	13	15	16
<i>Shigella boydi</i>	---	---	8	9	8	8	12	8	9	12	9	10	12
<i>Proteus vulgaris</i>	---	---	8	11	9	---	12	11	13	12	11	13	14
<i>Pseudomonas aeruginosa</i>	---	---	---	8	10	11	12	8	10	11	12	12	13
<i>Escherichia coli</i>	---	---	---	---	12	13	15	14	15	15	17	15	16
<i>Klebsiella pneumoniae</i>	---	8	9	10	9	8	10	8	---	9	---	9	11

Zone of inhibition in mm/diameter,  
A= 25microlitre, B= 50microlitre, C= 75microlitre

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