

**ANTIBACTERIAL EFFECT OF BULBOPHYLLUM
NEILGHERRENSE WT. (ORCHIDACEAE).
AN INVITRO STUDY**

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ABSTRACT

The antibacterial activity of *Bulbophyllum neilgherrense* was tested against five species of bacteria, viz., *Escherichia coli*, *Staphylococcus aureus*, *Bacillus pumilus*, *Pseudomonas aeruginosa* and *Pseudomonas putida*. Aqueous, ethanolic and chloroform soluble extracts of leaf and pseudobulb (5.50 w/v) were screened for their antibacterial potential. The zone of inhibition was seen to be largest when alcoholic extract was used.

INTRODUCTION :

In India, a large number of medicinal plants occur in the wild state. Since antibiotics are found to have enormous side effects substitutes for them are needed.

Orchids rouse our highest admiration not only with their bewildering range of flowers but also their horticultural and mainly medicinal values. They are rich in alkaloids and other phytochemical contents and are extensively used in indigenous system of medicine for over 3000 years. The parts like leaves, pseudobulbs and flowers of orchids are of great ethnobotanical importance and used for various ailments, for external application and internal administration by the tribal. The members of Orchidaceae have been reported for their pharmacognostic, antiviral, anticancerous,

antibacterial and antiinflammatory activities.¹⁻⁴

In the present paper, an attempt has been made to test invitro antibacterial efficacy of *Bulbophyllum neilgherrense* against five bacterial strains – *Escherichia coli*, *Staphylococcus aureus*, *Bacillus pumilus*, *Pseudomonas aeruginosa* and *Pseudomonas putida*.

MATERIALS AND METHODS:

Fresh leaves and pseudobulbs of *Bulbophyllum neilgherrense* were thoroughly cleaned in distilled sterilized water so as to remove dust and soil particles. The leaves and pseudobulbs were homogenized separately in 50 ml distilled

water, Ethanol and Chloroform to make a concentration of 5.50 (W/v) for aqueous, ethanolic and chloroform allowed to evaporate. The remaining plant material extracted in 50 ml of distilled water. These aqueous, ethanol and chloroform were allowed to evaporate. These aqueous, ethanolic and chloroform mixtures were filtered using muslin cloth and filter paper. The filtrates were centrifuged at 10,000 rpm for 20 min. The resultant supernatant was filtered through whatman's filter paper and sterilized by passing through 0.2 μ m filters and were used for invitro investigations.

The test organisms *Escherichia coli*, *Staphylococcus aureus*, *Bacillus pumilus*, *Pseudomonas aeruginosa* and *Pseudomonas putida* used in the present study were grown on the recommended nutrient agar slants. These cultures were revived from time to time. The disc diffusion method (Antimicrobial sensitivity testing / Kirby – Bauer method⁵) was used for testing the antibacterial potential of *Bulbophyllum neilgherrense*.

The suspension of the test organisms was poured into adequate quantity of the melted medium (at 30 – 35^o c) and was mixed thoroughly for the uniform distribution of the microbial colonies. This inoculated medium was then poured into the sterilized petriplates and left for solidification at room temperature. Filter paper discs of 5 mm diameter were used to test the antibacterial potential of the various aqueous, ethanolic and chloroform extracts

and compared with that of antibiotic sterilized distilled water, ethanol and chloroform that served as controls. The discs, saturated with respective liquids were equidistantly placed in the inoculated petriplates to allow diffusion for 30 min. at room temperature under aseptic conditions. The plates were then incubated at 35^o C for 24 hours. After the incubation period, the effective zone of inhibition was noted.

Results and Discussion:

The results, summarized in Table.1. reveals that the extracts, though less effective than streptomycin, proved inhibitory to bacterial growth in vitro. The growth inhibitory effect was more pronounced in ethanolic extracts of leaf and pseudobulb followed by chloroform and aqueous extracts. The ethanolic leaf extract was found more effective against *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* than *Bacillus pumilus* and *Pseudomonas putida*. The pseudobulb extract was found more effective against *Pseudomonas aeruginosa* and *Pseudomonas putida*.

Inhibitory effect of various plant part extracts including the leaf extracts of some orchids have been reported⁶. The bactericidal and fungicidal activity has been variously attributed to anthocyanins, alkaloids and other phytochemicals that are antimicrobial in nature⁷. Further indepth studies are, however needed to assess the clinical nature of components of the orchids studied.

Table – 1

S. No.	Micro Organisms	AVERAGE ZONE OF INHIBITION (mm)						
		LEAF			PSEUDOBULB			STREPTOMYCIN
		W	E	C	W	E	C	
1	<i>E-coli</i>	6.0	8.0	8.0	5.0	4.0	4.0	12.0
2	<i>S.aureus</i>	5.0	7.5	6.0	4.0	4.0	4.0	12.0
3	<i>B pumilus</i>	4.0	7.0	5.0	3.0	6.0	4.0	12.0
4	<i>P. aeruginosa</i>	3.0	7.5	6.0	5.0	6.0	6.0	10.0
5	<i>P.putida</i>	5.0	6.0	4.0	3.0	6.0	6.0	10.0

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