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Research Article

Antibacterial Activity in Extract of *Bauhinia. Vahlia*

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Abstract

Bauhinia species have a long history of traditional medicinal applications. The aim of the present study was to evaluate the antibacterial potential of the ethanol extracts of *B. vahlii* roots, barks, and seeds was tested for antimicrobial activity against bacterial water borne pathogens using agar well diffusion assay the antibacterial activities were found to be species independent. Effectiveness of the extracts against different bacterial strains was measured in terms of zone of inhibition in millimeters. The values determined were compared with the positive control (Ampicilin) with highest antimicrobial activity against all tested microorganisms.

Key Words: *Bauhinia. Vahlia*, Antibacterial activity, water borne pathogens.

Introduction

India is considered to be a country having rich emporia of medicinal plants and where ancient systems of medicine such as Ayurveda, Siddha, Unani medicines have been in practice for many years. Several rural communities depend on plant resources mainly for herbal medicines, food, forage, construction of dwellings, making household implements, sleeping mats and for fire and shade [1]. In recent times, there has been increasing interest in the study of bioactive compounds from peels, seeds, leaves, flowers and stem bark due to their antioxidative, antimicrobial and other health promoting properties. In rural and tribal area of

India, people still depend on traditional medicine for their health and treatment of diseases.

The relatively large *Bauhinia* genus consisting of trees, climbers and shrubs is distributed in a wide range of geographic location certain *Bauhinia* species have a long history of traditional medicinal applications [2]. *B.vahlia* is the largest creeper in India and is called *Adattige* in Telugu and *Asamantaka* in Sanskrit. It has been reported to contain amino acids, proteins, minerals and flavonoids [3]. The bark and tender shoots are crushed and rubbed over the wet skin and hairs. It produces bathing quality lather [4]. The seeds of *B.vahlia* contained higher contents of crude protein

and lipid [5]. In the tribal region of Visakhapatnam the roots and bark used as medicine it has control the dysentery [6]. Secondary metabolites or phytochemicals such as phenols, flavonoids, alkaloids, terpenoids, and essential oil are proved to be responsible for the antimicrobial activity of plants. These secondary metabolites are not essential for plant itself, however they play an important role in plant's defense system and give protection against pathogens and herbivores [7]. Despite the very encouraging traditional medicinal application of some species of Bauhinia, prior investigations to validate the traditional medicinal applications have not appeared in literature. The aim of the present study was to evaluate the antibacterial potential of the crude extracts of *B. vahlii* roots, barks, and seeds.

Materials and Methods

Collection of Plant Materials:

The roots, barks and seeds of *B.vahlii* were collected in July 2013 in Chinthapalli and Paderu Tribal area in Visakhapatnam. Botanical identification of the plants was done by Prof.M. Venkaiah, Department of Botany, Andhra University, Visakhapatnam. *B.vahlii* was conserved in A.U. University herbarium.

Extraction of Plant Materials:

For solvent extraction, 10g of air-dried powder was taken in 100ml of organic solvent (ethanol) in a conical flask, plugged with cotton wool and then kept on a rotary shaker at 190-220 rpm for 24h. After 24 hours the supernatant was collected and the solvent was evaporated to make the final volume one-fourth of the original volume [8] and stored at 4°C in airtight bottles.

Test Organisms:

Test pathogens microorganisms were isolated from drinking water used in tribal area of Chinthapalli with the help of environmental department of A U. Bacterial cultures of *E.col*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Salmonella typhi*, *Vibrio cholera*. The microbiological analysis was done from the P.G. department of microbiology, Visakha

Govt. Degree & P.G College [w] Visakhapatnam. The isolated bacterial cultures were sub cultures and maintained on nutrient agar media.

Antibacterial Assay:

The antimicrobial assay was performed by agar well diffusion method (Perez et al., 1990) for solvent extract. The molten Mueller Hinton Agar (HiMedia) was inoculated with the 100µl of the inoculums (1×10^8 Cfu) and poured into the sterile petri plates. In agar well diffusion method, a well was prepared in the plates with help of cork-borer (8mm). 100µl of test compound was introduced into well. The plates were incubated overnight at 37°C.

Results & Discussion

The results of the antibacterial assays are presented in Table.1. The values determined were compared with the positive control (Ampicilin) with highest antimicrobial activity against all tested microorganisms. In the present investigation ethanol extracts of root, bark and seeds were screened for their antibacterial activity against five human pathogenic bacteria. As can be seen in fig 1, varied degree of inhibitions of test bacteria were recorded of high zone of inhibition seen in *Salmonella typhi* seed extract. This is followed by *Vibrio cholera*, *Klebsiella pneumonia*, *Escherichia .coli* and *Staphylococcus aureus*. The low zone of inhibition was observed for *E.coli* in root & bark extract.

Our investigation showed that the antimicrobial activity of ethanol extract from *B.vahlii* roots might be related to the presence of flavonoids [9]. Flavonoids are known to exhibit antimicrobial through formation of a complex with the bacterial cell wall. The antimicrobial activity of the ethanol extracts from *B.vahlii* roots might be attributed to the presence of tannins the probable mechanism of these phenolic compounds activity includes enzyme inhibition by oxidized compounds, possibly through reaction with sulfhydryl group or through more nonspecific interactions with proteins

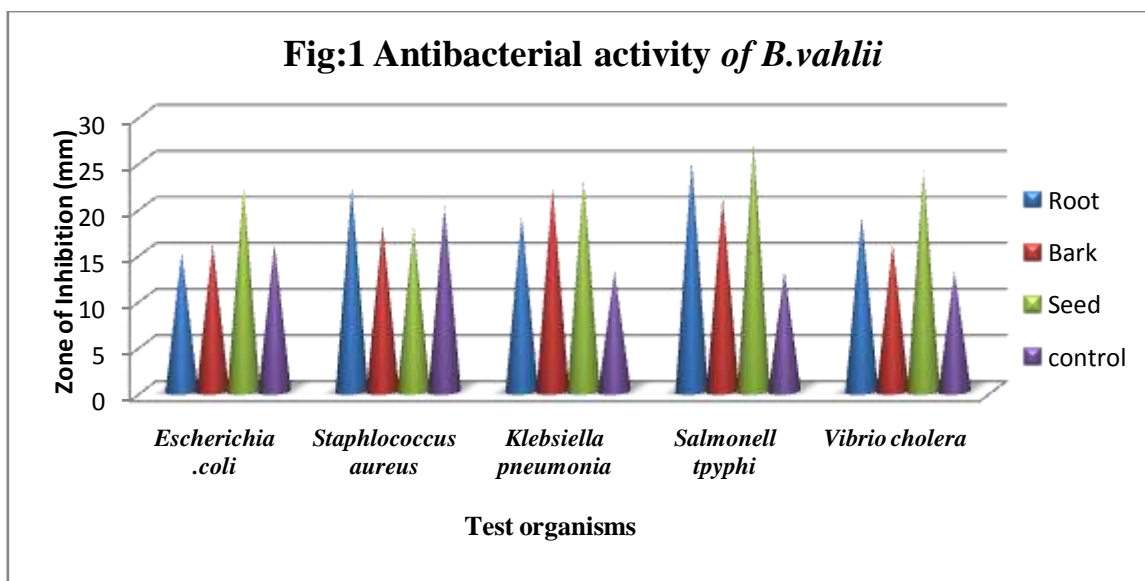


Table 1: Antibacterial Effect of *B.vahlii*.

S.No	Test Organisms	Zone of Inhibition (mm)			
		Root	Bark	Seed	Control
1	<i>Escherichia .coli</i>	15	16	22	16
2	<i>Staphylococcus aureus</i>	20	21	18	20
3	<i>Klebsiella pneumonia</i>	19	22	23	13
4	<i>Salmonella typhi</i>	22	18	27	13
5	<i>Vibrio cholera</i>	19	16	24	13

Conclusion

The presence of antibacterial substances in the higher plants is well established [10]. The present study provides an important basis for the use of extracts from these plants for the treatment of infections associated with the studied microorganism. Isolation and characterization and production of bioactive compounds from this *B.vahlii* are currently being carried out in our laboratory.

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