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ANTIBACTERIAL ACTIVITY OF DIFFERENT PARTS OF *IPOMOEA PALMETA, PARTHENIUM, LANTANA CAMARA* AND *CATHARANTHUS ROSEUS* AGAINST SOME BACTERIAL STRAINS

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ABSTRACT:
In present study the antimicrobial activity of various parts of plants *Ipomoea palmeta, Parthenium,* and *Lantana camara and Catharanthus roseus* against *E. coli, Pseudomonas* sp. and *Streptococci* sp. Root, leave, flower and stem of plants collected, dried and extract preparation was done in two different solvent methanol and ethanol. Results of antimicrobial assay shown that ethanol extract of various plants have more antibacterial activity as compare to methanol extract. Ethanol extract of *Ipomoea palmeta* root (10.0mm), *Parthenium* sp. flower (11.0mm), *Catharanthus roseus* stem(10mm) and *Lantana camara* leaf (20mm) were shown maximum zone of inhibition against *Streptococci,* than *Pseudomonas* whereas less effective against *E. coli.* Only methanol extract of *Parthenium* sp. stem shown maximum zone of inhibition against *E. coli* (15mm). The result of this work indicates that the differences in the zones of inhibition of different plants extracts might be related to the susceptibility of each test organisms to the extracts tested. These plants cannot ingested and cytotoxic but they have high microbial activity due to their alkaloid content that why it can be used for ointment for external uses, in some where as anti tumor and other traditional medicines.

Keywords: Antibacterial, Antitumor, Leukemia, *Ipomoea palmeta*, *Parthenium*, *Lantana camara*, *Catharanthus roseus.*

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INTRODUCTION

Plants could be described as a wonderful kitchen or chemical cabinets filled with attractive things. The ancient Egyptians were familiar with many medicinal herbs and were aware of their usefulness in the treatment of various diseases[1]. The development of bacterial resistance to presently available antibiotics has necessitated the search for new antibacterial agents. It has been observed however, that many plants contain one or more chemical substances with antimicrobial activities. Some of the wild plant parts are used as a medicinal purpose as they are mostly cultivated for their ornamental purpose because of their flowers which can be pink, orange, yellow, white lilac depending on the variety. *Lantana camara* leaves have been reported to make animals ill after ingestion and its berries are toxic before they become ripe[2,3]. Extracts from the leaves have been reported to have antimicrobial, fungicidal, insecticidal and nematicidal activity[4-7]. Antimicrobial compounds of plant origin may be found in plant stems, roots, leaves, bark, flowers, or fruits[8]. *Parthenium hysterophorus* L., (Asteraceae) is a common weed distributed worldwide. It´s decoction has been used in traditional medicine to treat fever, diarrhea, neurologic disorders, urinary infections, dysentery and malaria and as emmenagogue[9]. *Ipomoea asarifolia* (*Convolvulaceae*) is a glabrous succulent perennial plant trailing on the ground. It is found throughout West Africa and is a common weed of hydromorphic soils, low lying and inland valleys, streams and river banks. In Nigeria, the traditional names include "*Duman kada*" in Hausa and "*Gboro ayaba*" in Yoruba[10]. *Catharanthus roseus* is an important medicinal plant of family Apocynaceae. It is cultivated mainly for its alkaloids, which are having anticancer activities[11]. The antibacterial potential in crude extracts of different parts (*viz.,* leaves, stem, root and flower) of *C. roseus* against clinically significant bacterial strains[12]. Bacterial resistance to antibiotics is a

major therapeutic problem and the rate at which new antibiotics are being produced is slowing[13]. Thus, the search for novel antimicrobial agents is of the utmost importance[14]. Global attention has been shifted towards finding new chemicals, specifically herbals, for the development of new drugs.

MATERIALS AND METHOD

Source

The antimicrobial activity of four wild plants *Ipomea palmeta, Parthenium* sp.*, Lantana camara* and *Catharanthus roseus* were tested against three bacterial strains *E. coli, Psuedomonas* sp.*, Strreptococci* sp.*.* The three bacterial strains *i.e. E. coli, Pseudomonas* sp. and *Strreptococci* sp. were provided from Bhilai Mahila Mahavidyalaya, Bhilai.

Plant collection

The aerial parts of the four selected plants were collected from Sector area of Bhilai regions in the summer season of 2011.

Preparation of plant extracts

After collection, the fresh root, leave, shoot, floweral, parts were cleaned with water, air dried and coarsely powdered using a mortar and pestle, and then further reduced to powder using electric blender with different polarities, and powdered plant materials were extracted with ethanol and methanol. Extraction with each solvent was done along a period of two weeks under occasional shaking. Each sample extract was collected and concentrated to dryness using rotary evaporator at 40°C. The dried extracts were weighed and then stored in air tight container and kept at 4°C until it was used for further analysis.

Antibacterial activity

Activity was screened by agar well diffusion method[15]. Agar (HiMedia) was inoculated with the 100µl of the inoculums (1 x 108Cfu) and poured into the sterile Petri plates (Himedia). For agar well diffusion method, a well was prepared in the plates with the help of a cork-borer (4mm). 100µl of the test compound was introduced into the well. The plates were incubated overnight at 37 °C. Microbial growth was determined by measuring the diameter of zone of inhibition. For each bacterial strain controls were maintained where pure solvents were used instead of the extract. The result was obtained by measuring the zone diameter.

RESULTS AND DISSCUSIONS

In present study different parts of four wild plants *Ipomea palmeta, Parthenium* sp.*, Lantana camara* and *Catharanthus roseus* were taken for antimicrobial activity against 3 bacterial strains (*E. coli, Psuedomonas* sp.*,* and *Streptococci* sp.). For this experiment root, stem, flower and leaf extract is used for antimicrobial activity. Two solvents ethanol, methanol were used for extraction and it is considered as a control and zone of inhibition recorded (1mm).

- In case of *Ipomea palmeta* root extraction in ethanol shows maximum zone of inhibition (10mm) against *Streptococci* sp. whereas leaf extract shows minimum zone of inhibition against *E. coli* (2mm).
- In ethanol extract of *Parthenium* sp. shows maximum zone of inhibition (11mm) observed in flower extract against *Streptococci* sp. whereas stem extract shows minimum zone of inhibition against *E. coli* (2mm).
- In ethanol extract of leaf of *Lantana camara* shows maximum zone of inhibition (20mm) against *Streptococci* sp. whereas root extract shows no antibacterial activity against *E. coli*.
- In ethanol stem extract of *Catharanthus roseus* shows maximum zone of inhibition (10mm) against *Streptococci* sp. whereas flower extract shows no antibacterial activity against *E. coli*. (Table-1)
- In case of *Ipomea palmeta* flower extraction in methanol shows maximum zone of inhibition (5mm) against *Streptococci* sp. whereas leaf extract against *Streptococci* sp. and *Psuedomonas* sp.*,* and flower, stem and root extracts against *E. coli* shows no zone of inhibition.
- In methanol extract of *Parthenium* sp. shows maximum zone of inhibition (15mm) observed in stem extract against *E. coli* whereas leaf and flower extract shows no zone of inhibition against *E. coli*.
- In methanol extract of root of *Lantana camara* shows maximum zone of inhibition (5mm) against *Streptococci* sp. whereas root and stem, extract against *E. coli* and flower extract against all bacterial strains, leaf extract against *E. coli* and *Streptococci* sp. shows no antibacterial activity.
- In methanol stem extract of *Catharanthus roseus* shows maximum zone of inhibition (5mm) against *Streptococci* sp. whereas root extract against *E. coli*, stem and leaf extract against *Pseudomonas* sp. and *E. coli*, and flower extract against *E. coli* shows no antibacterial activity (Table-2).

From the above study revealed that ethanolic extract of different plants parts of four wild plants shows maximum zone of inhibition against *E. coli, Psuedomonas* sp.*,* and *Streptococci* sp. bacterial strains than methanolic extract. In case of ethanolic extract *Streptococci* sp. shows mostly sensitivity and inhibited its growth whereas *E. coli,* shows maximum resistance against all taken part of four wild plants. But in case of methanolic extract *E.coli* shows maximum sensitivity for stem of *Parthenium* sp.

In the present work, in vitro studies concluded that the plant extract inhibited bacterial growth but their effectiveness varied. The antimicrobial activity has been attributed to the presence of some active constituents in the extracts. This antibacterial study of the plant extracts demonstrated that folk medicine can be as effective as modern medicine to combat pathogenic microorganisms. The millenarian use of these plants in folk medicine suggests that they represent an economic and safe alternative to treat infectious diseases.

Previous studies revealed that extracts from the leaves have been reported to have antimicrobial, fungicidal, insecticidal and nematicidal activity[4-7]. Antimicrobial compounds of plant origin may be found in plant stems, roots, leaves, bark, flowers, or fruits[8]. *Parthenium hysterophorus* L., (Asteraceae) has been used in traditional medicine to treat fever, diarrhoea, neurologic disorders, urinary infections, dysentery and malaria and as emmenagogue[10]. *Catharanthus roseus* are having anticancer activities[11.] The antibacterial potential in crude extracts of different parts (*viz.,* leaves, stem, root and flower) of *C. roseus* against clinically significant bacterial strains[12,13]. Related previous studies supported present study.

Table 1: Antimicrobial activity of various parts of plants against different microorganisms using Ethanol as solvent.

Microorganisms	Zone of Inhibition (mm)															
	Root				Stem				Flower				Leaf			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
E. coli	-	3	5	-	3	2	3	4	-	5	1	2	2	3	4.5	5
***Pseudomonas* sp.**	4	3.5	6	6	6	3	7	4.3	2	8	4	3	6	4	5	12
***Streptococci* sp.**	10	7	8	8	8	6	10	5	6	11	5	5	9	8	6	20

Table 2: Antimicrobial activity of various parts of plants against different microorganisms using methanol as solventWhere; *A) Ipomoea palmeta* B) *Parthenium* sp. C) *Catharantus roseus* and D) *Lantana camara*

Microorganisms	Zone of Inhibition (mm)															
	Root				Stem				Flower				Leaf			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
E. coli	-	6	-	-	-	15	-	-	-	-	-	-	-	-	-	-
***Pseudomonas* sp.**	1	5	4	2	2	5	2	-	4	2	-	4	-	1	3	-
***Streptococci* sp.**	3	2	5	3	2	2	1	5	5	3	-	3	1	6	-	3

CONCLUSION

In present study different parts of four wild plants *Ipomea palmeta, Parthenium* sp.*, Lantana camara* and *Catharanthus roseus* were taken for antimicrobial activity against 3 bacterial strains (*E.coli, Psuedomonas* sp.*,* and *Streptococci* sp.) with respect to two different extraction solvent ethanol and methanol.

Present investigation concluded that Streptococci sp. shows maximum sensitivity for all part of four wild plants, followed by *Psuedomonas* sp. and *E.coli shows* maximum resistance. Ethanol extract have more antibacterial activity as compare to methanol extract of all plants. Ethanol extract of *Ipomoea palmeta* root (10.0mm), *Parthenium* sp. flower (11.0mm), *Catharanthus roseus* stem(10mm) and *Lantana camara* leaf (20mm) were shown maximum zone of inhibition against *Streptococci,* than *Pseudomonas* whereas less effective against *E. coli.* Only methanol extract of *Parthenium* sp. stem shown maximum zone of inhibition against *E.coli* (15mm). Only Methanol extract of stem of *Parthenium* sp. shows antibacterial activity against *E. coli* (15mm).

The folkloric usage of the studied plants and suggests that some of the plant extracts possess compounds with antibacterial properties that can be used as antimicrobial agents in new drugs for the therapy of infectious diseases caused by pathogens. The most active extracts can be subjected to isolation of the therapeutic antimicrobials and further pharmacological evaluation. These findings support the traditional knowledge of local users and it is a preliminary, scientific, validation for the use of these plants for antibacterial activity to promote proper conservation and sustainable use of such plant resources.

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