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Studies on antibacterial activity of some plant extracts

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Abstract
The antibacterial activity of the extracts of *Melia azedarch* (L), *Spilanthes paniculata* (L, f), *Oxalis Corniculata, Colocassic esculenta* (L), and *Hyptis suaveolens* (L) were evaluated against five bacteria isolated from semen samples (*E. coli., S. aureus, P. vulgaris, P. aeruginosa* and *B. subtilis*). These plants are used in medicine to treat infections of microbial origin.

Keywords: Antibacterial activity, Medicinal plants.

INTRODUCTION

Medicinal plants represents a rich source of antimicrobial agents. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. Traditionally used medicinal plants produce a variety of compounds of known therapeutic properties (Iyenger, 1985; Harborne and Baxter, 1999). The substance that can either inhibit the growth of pathogens or kill them and have no or least toxicity to host cells are considered candidates for developing new antimicrobial drugs.

The aim of this study was to evaluate the antimicrobial activity of some medicinal plant used in Ayurveda and traditional medicinal system for treatment of maninfestations caused by microorganisms. Therefore, extracts of the following five plants form different families were tested for their potential activity against microbial pathogens isolated from semen samples. *Melia azedarch, Colocassia esculents, Spilanthes paniculata, Hyptis suaveolens* and *Oxalis corniculata.*

MATERIALS AND METHODS

Plant Material

The different parts of plants used in Ayurveda and traditional systems of medicine were collected from various region of Akola district. Plants were identified by Dr. S. P. Rothe (Botanist) at Shri. Shivaji College, Akola. The plant material was dried in shade.

Table 1. Five different medicinal plants

Sl. No.	Plants	Family	Parts used
1	*Collocassia esculenta*	Areaceae	Leaves
2	*Melia azedarch*	Meliaceae	Leaves
3	*Spilanthes paniculata*	Asteraceae	Stems, flowers
4	*Oxalis corniculata*	Oxiladiaceae	Leaves
5	*Hyptis suaveolens*	Lamiaceae	Leaves

Preparation of Plant Extracts

The powdered plant materials were extracted successively with water, acetone and 90% methanol. The extract was prepared at room temperature by simple extraction method (Daneil, 1975) was used with slight modification.

Microorganisms

Bacterial cultures were isolated from semen samples used along with the standard strains. Quality control strains of *S. aureus* (ATCC 6538), *E. coli* (NCIM 2931), *P. vulgaris* (NCIM 2027), *B. substilis* (MTCC 441) and *P. aeruginosa* (NCIM 2036).

Antibacterial screening

Antibacterial screening were preformed by agar well diffusion method (Perez *et al.,* 1990) with some modification 1 ml of inoculums (prepared as described in 4.2) was transferred aseptically to each sterilized Petridis (90mm diameter) sterilized and cooled (45°C) sensitivity test agar (15 ml) was poured into this Petridis. The inoculums was mixed roughly with the agar medium so as to get uniform distribution and then the agar was allowed to solidify wells were cut out in the solid medium with flamed 5 mm cork borer equidistantly from each other and the center. The wells were sealed at the bottom with melted agar. Different concentrations of the plants extracts and solvent blank (50 µl each) were transferred to the wells. The plates were kept in refrigerator at 4°C for 40 min and then incubated at 37°C for 18-24 hrs. Zone of inhibition, if any was measured for each concentration as diameter in mm. The experiments were carried out in duplicates and the average diameter of the zone of inhibition was recorded.

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RESULT AND DISCUSSION

Table 2. Antibacterial Potential of Aqueous extract of selected plants

Sr. No.	Plants and their parts Used	*E. coli*	*S. aureus*	*P. areuginosa*	*P. vulgaris*	*B. subtilis*
1	*Melia azedarch* (L)	8	9.5	8	10	10
2	*Spilanthes paniculata* (L,F)	10	11	12	13	8
3.	*Oxalis corniculata* (L)	8	12	8	11	10
4	*Colocassia esculenta* (L)	R	10	9.5	7	8
5	*Hyptis suaveolens* (L)	11	12	12	10	10

Table 3. Antibacterial potential of plant extract.

Sr. No.	Plants and their parts Used	Extract	*E. coli*	*S. aureus*	*P. areuginosa*	*P. vulgaris*	*B. subtilis*
1	*Melia azedarch* (L)	A	06	06	5.5	9	7
		M	08	6.7	6.6	10	8.4
2	*Spilanthes paniculata* (L,F)	A	NR	8	10	NR	10
		M	8	10	12	NR	12
3.	*Oxalis corniculata* (L)	A	6	11	10	6	12
		M	8	14	12	6.5	14
4	*Colocassia esculenta* (L)	A	11	12	11	10	14
		M	12	14	12	12	16
5	*Hyptis suaveolens* (L)	A	11	14	6.5	10.5	10
		M	12	12	9.5	12	12

DISCUSSION

In present investigations, 5 plants weer screened for antibacterial activity against five standard bacterial cultures. Since leaves of *S. paniculata* and *H. suaveokns* possess strong antibacterial activity between zone size 8 – 12 mm followed by *O. corniculata, M. azedarch* and *C. esculenta*. Aqueous extract of *C. esculenta* does not showed activity against *E. coli.*

In present study the acetone and methanal extract of *M. azedarch, O. corniculata, C. esculata* and *H. suaveolens* shows significant antibacterial activity. *S. paniculata* also shows antibacterial activity but does not showed activity against *P. vulgaris.*

Results suggests that all five plants possess significant antibacterial activity.

CONCLUSION

Population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several allopathic drugs and development of resistance to diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. Global estimates indicate that 80% of about 4 million population cannot afford the products of the Western Pharmaceutical Industry and have to rely upon the use of traditional medicines which are mainly derived from plant material.

Both herbs and herbal products are known to have antibacterial potential (De Boer *et al.,* 2005; Adwan *et al.,* 2006). Herbal treatments become very popular because it is easily available, cheaper and less toxic than synthetic drugs.

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