SCREENING OF ANTIMICROBIAL ACTIVITY OF OCIMUM SANCTUM LINN. AGAINST CERTAIN HUMAN PATHOGENS

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ABSTRACT

The beneficial health effects of extracts from different types of plants that are used for many purposes have been claimed for centuries. The purpose of the present study was to examine the effectiveness of three extracts of Ocimum sanctum for control of growth and survival of microorganisms. Inhibition of growth was tested by the paper disc agar diffusion method. Antibiotic susceptibility discs were used as control. Three bacterial strains viz. Staphylococcus aureus, Klebsiella pneumoniae and Escherichia coli were used as test microorganisms for the antibacterial activity of O. sanctum. Some of the extracts were found to be active against some bacterial strains. The methanolic extract exhibited a higher level of antibacterial activity.

Keywords: Antimicrobial activity, Ocimum sanctum Linn., S. aureus, K. pneumoniae and E. coli, Zone of Inhibition.

INTRODUCTION

There is nothing more important in the world than the health of a person. Throughout the ages plants have been used by humans as a source of food, cosmetics, medicines, clothing and even shelter. It has been estimated by the World Health Organization that about 80% of the world’s inhabitants rely mainly on traditional medicines for their primary health care. The United States National Cancer Institute (NCI) has screened well over 100,000 plant extracts for anticancer activity and over 30,000 for anti-AIDS activity. A number of workers have carried out investigations pertaining to antimicrobial action of plant extracts against an array of pathogens.

Ocimum sanctum Linn. a member of Labiatae family commonly known as ‘Tulsi’. A genus of aromatic herbs, under shrubs or shrubs distributed in the tropical and warm temperate regions of the world. Nine species are found in India of which three are exotic. Several Ocimum species yield essential oils which are valued in medicine and perfumery.
EXPERIMENTAL

Preparation of Extracts

Aqueous extract:
Fresh leaves of *Ocimum sanctum* Linn. were collected and shade dried at room temperature. 30g of dry leaves were extracted with 150ml of distilled water in a Soxhlet apparatus and the extract obtained was concentrated and evaporated under reduced pressure at 50°C using a rotavapor apparatus.

Methanolic extract:
30g of dry leaves of *O. sanctum* were macerated in 150ml of 80% methanol and extracted and concentrated as described above.

Petroleum ether extract:
30g of dry leaves of *O. sanctum* were extracted with 150ml of petroleum ether in a Soxhlet apparatus and the extract obtained was concentrated as described above.

In each case, one petriplate served as control and was provided with a filter paper disc impregnated with double distilled water.

Microbial strains:
The microorganism used in the study were *Staphylococcus aureus, Klebsiella pneumoniae* and *Escherichia coli*.

| Table - 1 : Antibacterial activity of *Ocimum sanctum* against human pathogens |
|-------------------------------------------------|------------------|------------------|
| Bacterial Strain | *Staphylococcus aureus* | *Klebsiella pneumoniae* | *Escherichia coli* |
| Aqueous extract  | 12 | 10 | 9 |
| Methanolic extract | 16 | 13 | 15 |
| Petroleum ether extract | 14 | 12 | 12 |
| Control          | 0 | 0 | 0 |

Microbial assay:
The antibacterial activity of the extracts was evaluated by the paper disc agar diffusion method. Tests plates were prepared with Nutrient Agar medium. Paper discs of size (5.2mm) were impregnated with the extract and deposited on the surface of the inoculated plates. After 24 hours of incubation at 37°C, positive results were established by the presence of clear zones of inhibition around the active extracts.

RESULTS AND DISCUSSION

The antibacterial activity shown in Table - 1 and Fig.-1 indicates that the different extracts of *Ocimum sanctum* inhibit the growth of bacterial strains to a great extent. Methanolic extract of the plant show a great degree of activity against the pathogens selected for the investigation. Methanolic extract show a maximum zone of inhibition of 16mm against *S. aureus*, which is higher than any of the extracts selected against *K. pneumoniae* and *E. coli*.

It is a well known fact that a number of ailments are cured with the help of herbal drugs the world over. The practitioners of indigenous Unani, Ayurvedic and Homeopathic systems of medicine in general and tribals in particular heavily and solely rely on the therapeutic efficacy of herbs for the treatment of all sorts of human ailments. In the present investigation, *O. sanctum* leaf extracts (Aqueous, Methanolic and Petroleum ether) have been tested against three bacterial strains *i.e. S. aureus, K. pneumoniae* and *E. coli* for its antimicrobial activity. All the above mentioned strains were found to be more sensitive to methanolic extract which is evident from the diameter of ZOI (Table -1). It is followed by Petroleum ether extract and least effect was aqueous extract of this plant. This inhibitory effect is of crude extract and further investigations are needed to find out or isolate the active principle.
which can be attributed with antimicrobial potential. It is likely, that the active principle when administered alone in pure form may exercise higher degree of bactericidal or bacteriostatic action.

In our country, majority of the people live below poverty line and therefore, in case of suffering from an ailment cannot afford the sky rocketing prices of chemotherapeutic mode of treatment. Therefore, if found effective, the herbal drugs may be alternative source of treatment which are within the reach of a common man. Such investigations should be encouraged because of abundance of medicinal herbs available at hand which can relieve the ailing humanity.

The results reported here can be affected by factors such as extraction method, yield of extract, antibacterial test methods etc.

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REFERENCES


