# *C. dactylon* (Linn.) Pers : An Anti-microbial study

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## ABSTRACT

*C.dactylon (Linn.) Pers. commonly known as Durvais well known traditional medicine and widely used throughout the world for its therapeutic use in a wide range of ailments. The aim of present work is to determine the antimicrobial potential of this plant. The two Gram positive andtwo Gram negative bacteria were used to evaluate the antimicrobial activity of water, methanol, chloroform, n-hexane and acetonitrile extract ofC.dactylon (Linn.) Pers.and has revealed that Methanol extract was found to inhibit the growth of S.aureus, B. subtilis, E.coli and S. typhi with a diameter of 7 mm,8 mm, 7.5mm and 7 mm respectively.Acetonitrile extract of C. dactylon(Linn.) Pers. was found to inhibit B. subtilis and their zone with a diameterof 7 mm.*

**KEY WORDS:-***C. dactylon (Linn.) Pers, Antimicrobial activity, gram positive, gram negative.*

## INTRODUCTION

The use of higher plants and their extracts for cure of localized and generalized human infections begin since antiquity. Over 300,000 species of plants are known to occur in nature, out of which more than 11,000 species of plants are known to grow in our country. Nearly 2,000 of these plants are attributed with certain medicinal properties. The knowledge assimilated by some of the great ayurvedsare based upon indigenous experiences of several generations and is passed on from one generation to the next. In certain cases where the knowledge was not passed on was often lost.

In the present era where scientists are more interested in synthesizing and increasing the number of new drugs, some scientists are also showing interest in plant based medicines. Extracts of plants belonging to 157 families have been reported to be microbiologically active. These activities may be distributed throughout all parts of the plant i.e. root, stem, leaf, flower, fruit and seed or in any of these individually or cumulatively. Antimicrobial activity exhibited may be due to some non-specific factors like tannins, vegetable acids, chlorophyll, essential oils, or some specific anti-microbial substance(s).

*C. dactylon*(Linn.) Pers. is well known traditional medicine, which is used clinically. Biological assays, including biochemical, immunological and microbiological assays are used to determine the activity of a variety of substances in plants.In these assays, the compounds being quantitated either depress or stimulate the growth of a sensitive test organism. These test organisms may include strains found in nature or strains that are mutated artificially for their use in an assay

The study was therefore undertaken to evaluate the antimicrobial activity of *Smilax glabra* rhizome extracts (methanol, chloroform, n-hexane and acetonitrile) of *S.glabra* were prepared and evaluate for their antimicrobial activity against Gram positive and Gram negative microorganisms.

## MATERIALS AND METHODS

**Plant material**

Freshly harvested plant of C.dactylon (Linn.) Pers. was used for the preparation of the extract. The plants were authenticated by NBRI (National Botanical Research Institute), Lucknow, India.

**Chemical and Reagents:**

Standard antibiotics Ciprofloxin and clotrimazole were purchased from chemist. Analytical grade solvents purchased from Merck India were used in this study.

**Preparation of Extract**

The extracts of C.dactylon (Linn.) Pers. powders were separately prepared in water, methanol, acetonitrile, chloroform and n- hexane (10 mg/ml). Briefly 10 milligrams of the plant powders was accurately weighed and suspended in 1 ml of organic solvents (water, methanol, acetonitrile, chloroform and n-hexane). The mixture was allowed to stand for 6 to 8 h and then filtered through Whatmann filter paper no.1. The filtrate was evaporated to dryness and the residue obtained was stored at 4oC.

**Microorganisms**

The antimicrobial activities of the extracts were tested individually against Gram positive and Gram negative bacterial strains (Table 1). The bacterial strains were obtained from NCIM, (NCL) Pune and clinical isolates.

**Table-1**Test Microorganisms Used To Test The Bioassay

| **Sr. No.** | **Microorganism** | **Grams character** | **NCIM No.** |
|---|---|---|---|
| 1. | *Bacillus subtilis* | Gram positive | Clinical isolate |
| 2. | *Staphylococcus aureus* | Gram positive | 5021 |
| 3. | *Escherichia coli* | Gram negative | 2256 |
| 4. | *Salmonella typhi* | Gram negative | Clinical isolate |

The test organisms used for antimicrobial study for C. dactylon (Linn.) Pers. were given in table 1. These organisms were maintained on the nutrient agar and sabaourd's agar slants. Subcultures were made on fresh medium when required. The master cultures were subcultured every month. The cultures were stored in the refrigerator. Purity of each culture was checked at the time of subculturing by examination of colonies, by microscopic examination of the stained slides and by using biochemical fermentation tests.

**Bacterial susceptibility testing**

In order to assess the antimicrobial activity of different extracts of C. dactylon (Linn.) Persthe residue was reconstituted in 0.5 ml of dimethyl sulphoxide (DMSO) it does not show any antimicrobial activity. Under sterile conditions, molten nutrient agar was prepared and poured into the petriplates. The plates were allowed to cool till the medium was solidified. The bacterial culture was inoculated on the surface of agar by sterile glass spreader then was allowed to dry. Small paper discs impregnated with test extracts were placed upon the surface of an inoculated plate. The plates were kept in the incubator at 370C for 24 h. The plates were then observed for any zones of inhibition surrounding the discs. The bioassay was done in triplicate and the average value was taken as zone of inhibition.The zone diameter of the disc used for the study was 5 mm. The standard antibiotic Ciprofloxcin and Clotrimazole also tested against the test bacteria used in the study.

**OBSERVATIONS**

**Table-2**Antimicrobial activity of C. dactylon (Linn.)Pers.

| Gram character | Organisms | Methanol | Chloroform | n-hexane | Acetonitrile | Water |
|---|---|---|---|---|---|---|
| ***Gram positive*** | ***S.aureus*** | 7 mm | - | - | - | - |
| | ***B.subtilis*** | 8 mm | - | - | 7 mm | - |
| ***Gram negative*** | ***E.coli*** | 7.5 mm | - | - | - | - |
| | ***S.typhi*** | 7 mm | - | - | - | - |

**Key ' –' = No growth**

**Zone of inhibition (mm) includes zone diameter of disc=5 mm**

**Table-3**ANTIMICROBIAL ACTIVITY OF ANTIBIOTICS

| Standard | Zone of Inhibition (mm) |
|---|---|
| Ciprofloxcin 1000µg/ml | 6.4 |
| Clotrimazole 1000µg/ml | 5.4 |

## RESULTS

The ability of the test substances to inhibit bacterial growth is indicated by the appearance of a zone of inhibition aroundthe disc containing the test solution. After specified incubation period, the agar plates were examined for growth. First, the positive control without C. dactylon (Linn.) Pers. extract was checked to ensure that each test strain was capable of providing adequate growth. The negative control was checked for the absence of growth thereby indicating the sterility of the medium. The remaining plates were examined for the presence or absence of growth. In reading the end points, a faint haze of growth of a single colony was evident for antimicrobial activity. A dense film of growth or more than one colony was considered as evidence that the extract failed to inhibit the growth. The zone of inhibition was measured by using vernier calipers. The results are discussed in Table 2 and Table 3

## CONCLUSION

Solvents of varying polarity were used in preparing the extracts of C. dactylon (Linn.) Pers.extracts showed varying effects on the test organisms.Methanol extract of C. dactylon (Linn.) Pers. was found to inhibit the growth of S.aureus zone diameter was 7 mm, B. subtilis zone diameter was 8 mm, E.coli zone diameter 7.5mm andS. typhi zone diameter was 7 mm .Acetonitrile extract of C. dactylon (Linn.) Pers. was found to inhibit B. subtilis and their zone diameters was 7 mm.Water extract of C. dactylon (Linn.) Pers. was found to have no anti-microbial action. The search for antimicrobial principles from and from microbial life shares a common philosophy. Researchers have extensively studied the microbial source. It can therefore be concluded that natural products of origin can be exploited for the search of natural pesticides as well as for medicinal products from plant origin.

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