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# PHARMACOGNOSTICAL AND BIOLOGICAL STUDIES OF LEAVES OF *CHROMOLAENA ODORATA*

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**ABSTRACT**

The present study deals with pharmacognostical studies which includes the study of powder characters, transverse sections of leaf of *Chromolaena odorata*. Anti-microbial activity of the isolated compounds/extracts by disc diffusion method using *Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa*, and *Bacillus cereus*.

**Key words**: *Chromolaena odorata*, Anti-microbial activity, Disc diffusion method.

## INTRODUCTION

*Chromolaena odorata* is also called as Siam weed [1] belongs to family Asteraceae is potentially distributed in Australia, Africa & Oceania, and it is also found in India (West Bengal, Nagaland). *Siam weed* is considered to be one of the world's most invasive weeds and has the potential to spread across northern Australia and down both the eastern and western coastlines. Siam weed was first identified in Australia in 1994, as several large infestations along the Tully River and at Bingil Bay near Mission Beach in Far North Queensland. The medicinal values [2] of plant lie in their component phytochemicals such as alkaloids, tannins, flavonoids, phenolic compounds and other nutrients [3,4] like as amino acid, proteins, which produce a definite physiological action on the human body. A systematic search for useful bioactivities from medicinal plants is now considered to be a rational approach in nutraceutical and drug research. In the traditional system of medicine plant is Beneficial for treatment of wounds [5], anti-inflammatory property, soft tissue repair, and other skin infection.

## MATERIALS AND METHODS

Fresh Leaves of *Chromolaena odorata* were collected and authenticated by Alva's education foundation Moodbidri. Leaf and stem sample was subjected for microscopy and macroscopical identification based on colour, odour, taste, form, size and fracture of the drug. Microscopical studies were done by preparing a thin hand section of bark. It was cleared, stained with phloroglucinol & HCL& mounted in glycerine and observed under microscope .the powder drug was separately heated with phloroglucinol HCl solution and mounted in glycerine for microscopical evaluations. All the chemicals and solvents used in experiment were of analytical grade.

The disc diffusion method was used to screen the antimicrobial activity. In vitro antimicrobial activity was screened by using nutrient agar media obtained from Himedia (Mumbai). These studies were performed in triplicate by using standard drugs (10 units/disc Penicillin; for bacteria) [6].

## RESULTS AND DISCUSSION

### Macroscopical characteristic

The leaves of Siam weed are soft, green, hairy and roughly triangular in shape with a distinctive pitchfork three-vein pattern. They can emit a distinctive odour when crushed. New leaf growth can have a purple colouration. *Siam weed* looks similar to blue top or Billy goat weed, but its leaves are generally softer, more triangular in shape, less hairy and less serrated (toothed) on the edges.

### Microscopical studies

Few dried leaves were soaked in water for some time (till it get soften). The leaf was placed in between 2 potato slices and with the help of a sharp blade thin transverse sections were taken and placed in a watch glass; the sections were cleared by warming in chloral hydrate solution and stained with staining reagents containing a mixture of phloroglucinol and concentrated hydrochloric acid. Dilute hydrochloric acid and glycerol were used as mounting fluids for stained and unstained sections respectively. The section showing parenchymatous cells, collenchymatous cells, sac shapes vascular bundle, covering trichome and starch grains.

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**Fig 1. Morphology of leaf**

**Powder microscopy**

The powder revealed the presence of starch grain, fibre bundle & covering trichome.

**Antimicrobial susceptibility test**

The disc diffusion method was used to screen the antimicrobial activity. In vitro antimicrobial activity was screened by using nutrient agar media obtained from Himedia (Mumbai). The nutrient agar plates were prepared by pouring 15 ml of molten media into sterile petriplates. The plates were allowed to solidify for 5 minutes and 0.1 % inoculum suspension was swabbed uniformly and the inoculum was allowed to dry for 5 minutes. The different extracts and isolated compounds were loaded on 3mm sterile disc till saturation. The loaded disc was placed on the surface of medium and the compound was allowed to diffuse for 5 minutes and the plates were kept for incubation at 37°C for 24 hrs. At the end of incubation, inhibition zones formed around the disc were measured with transparent ruler in millimeter. These studies were performed in triplicate by using standard drugs (10 units/disc Penicillin; for bacteria).

**Anti-microbial activity of extracts**

The extracts were subjected to anti-microbial activity using different micro organisms.

**Anti-microbial activity of isolated compounds**

The compounds were subjected for anti-microbial activity using different organisms. The zone of inhibition was not found against *Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus cereus, Escherichia coli* when compared with standard penicillin.

**Fig 2. T.S of the leaf**

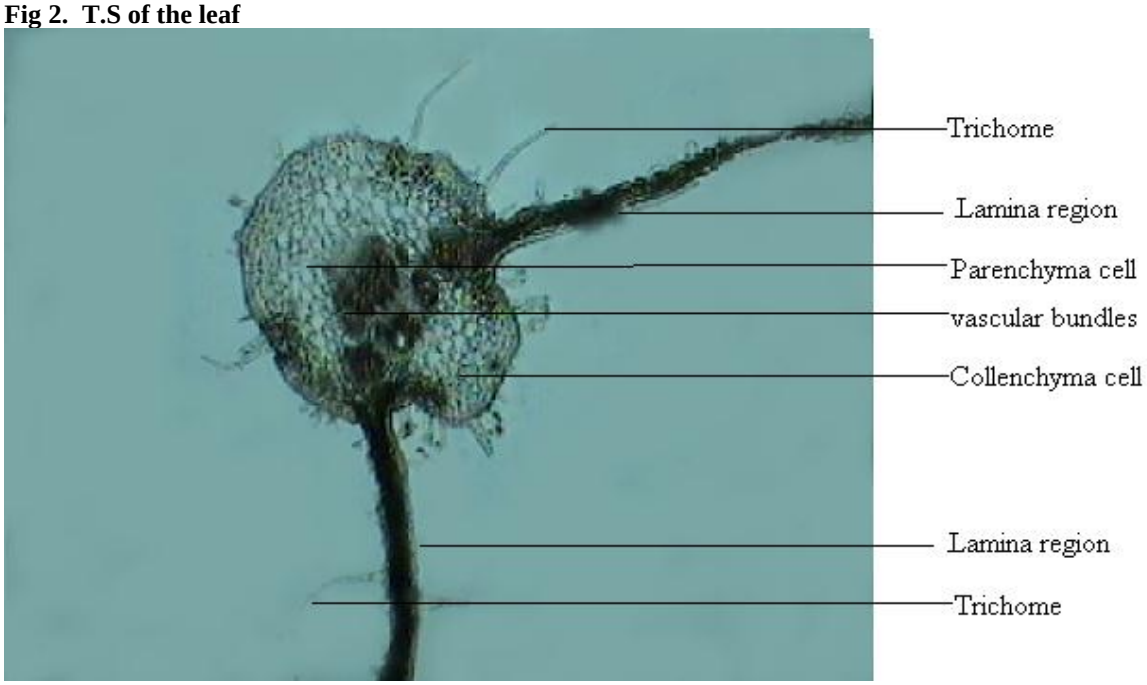



**Table 1. Zone of inhibition of different extracts**

| Organisms | Zone of inhibition of extracts in mm | | | | | STD |
|---|---|---|---|---|---|---|
| | P.E | B.E | C.E | Me.E | Aq.E | |
| *Staphylococcus* | 7 | 7 | 6 | 7 | NI | 10 |
| *Pseudomonas* | 7 | 6 | 6 | 6 | NI | 10 |
| *Bacillus* | NI | NI | NI | NI | NI | 10 |
| *E. coli* | NI | NI | NI | NI | NI | 10 |

NI=No Inhibition; P.E= Petroleum ether extract; B.E= Benzene extract; C.E= Chloroform extract; Me.E= Ethanolic extract; Aq.E= Aqueous extract; STD=Standard (Penicillin 10 units/disc)

**Fig. 3. Powder microscopy of leaf**

*(a) Covering trichome* *(b) Starch grain* *(c) Fiber Bundle*

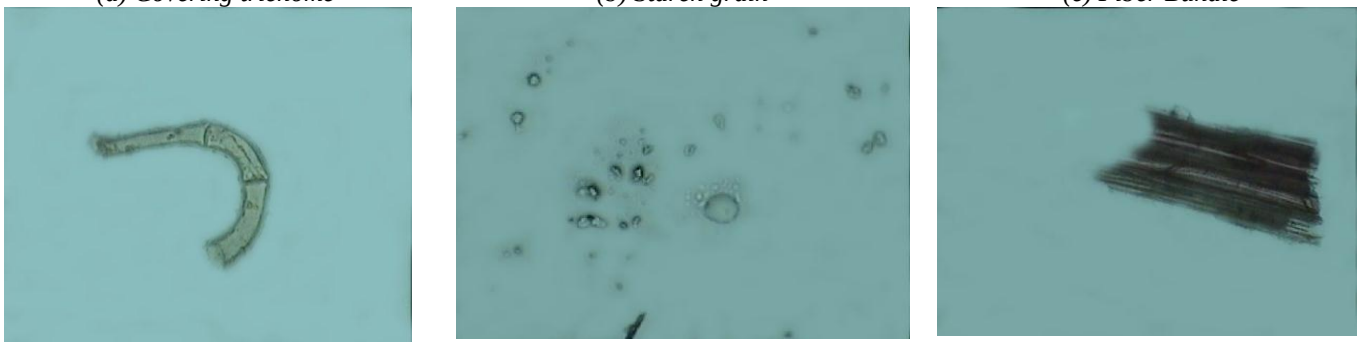
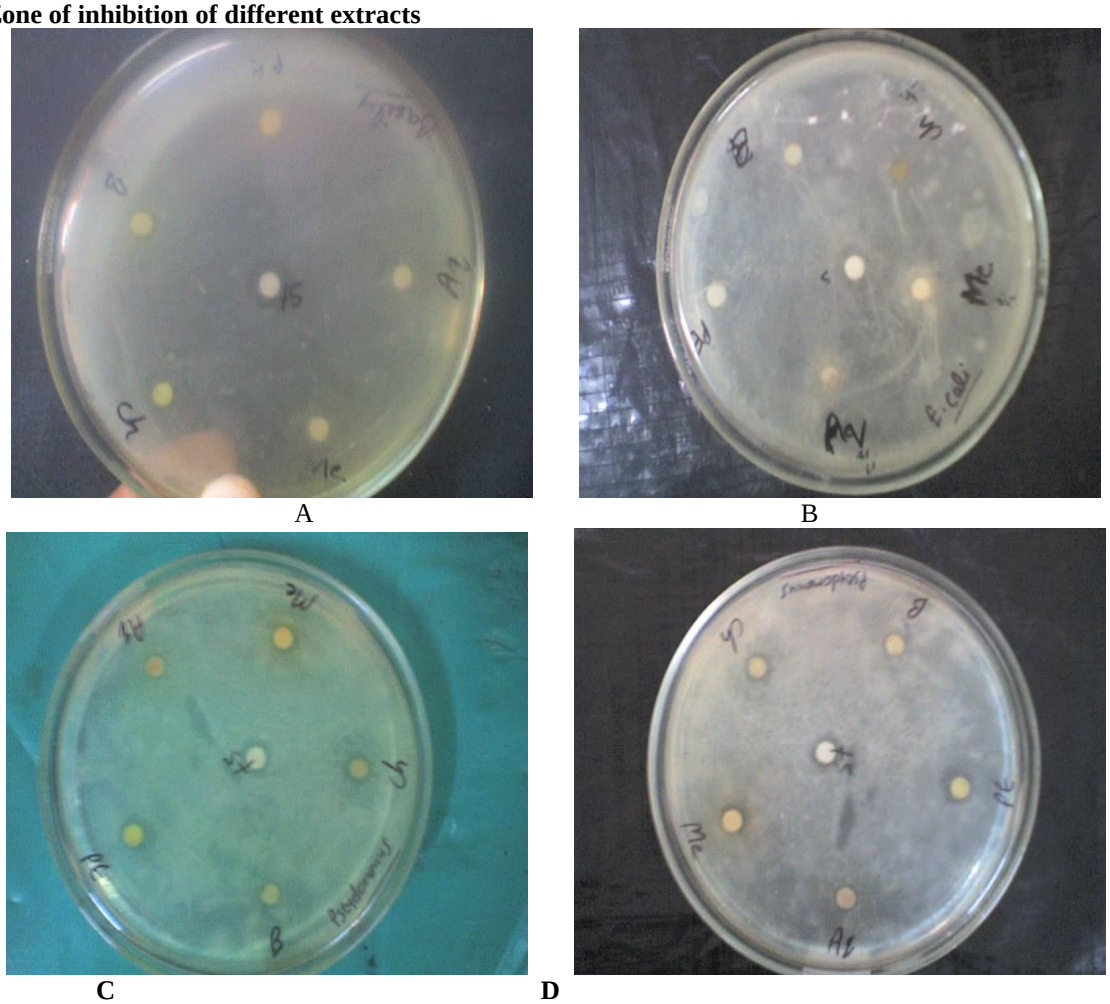


**Figure 4. Zone of inhibition of different extracts**



A B

**C** **D**

**Plates :** a – Bacillus; b – E.coli; c – Pseudomonas; d – Staphylococcus.
**Discs :** P E – Pet ether extract; Me – Methanolic extract; Ch – Chloroform extract; B – Benzene extract; Aq– Aqueous extract

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