

Short Communication

Preliminary Phytochemical and Anti-bacterial activity of hydro alcoholic extract of *Typha angustata*.(L). Rhizome

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Typha angustata is a commonly identified wild plant at ponds, lakes and wet lands. It has potential uses from the literature. The different extracts of the aerial parts of the plant are reported with anti-inflammatory activity of extracts of leaves, inflorescence, catatonic activity of methanolic extract of leaves and osteoinductive potential of the pollen extract along with diuretic, astringent, desiccant and haemostatic activities while the underground parts of this plant like rhizomes and roots make this plant a useful agent for waste disposal agent and effluent treating agent from the sugar industry. The rootstock of this plant is used as an astringent and diuretic. The starchy rhizomes are nutritious with good protein content. In our present study the hydro alcoholic extract of rhizomes was prepared and screened anti-microbial activity by agar plate diffusion method invitro. It showed significant activity against all the microorganisms used in the test.

Key words: *Typha angustata*, aerial parts, rhizomes, anti-microbial.

Typha angustata is perennial plant and grows as aquatic weed widely in water logged areas and belongs to the Typhaceae family in plant kingdom. *Typha* is a genus of *Typha angustata*. It contains eleven species of monocotyledonous flowering plants in the family Typhaceae. The Genus has a largely northern hemisphere distribution but it essentially cosmopolitan. *Typha angustata* is an important plant of tropical regions & mainly distributed in India, Japan and china (Ashok Kumar et al., 2013). It is used in the preparation of paper, in the manufacture of chairs, boats along with its culinary uses of rhizomes of the plant. It is also used in waste water purification (Debing et al., 2009). The various extracts of leaves of this plant have anti-inflammatory effect in rats using carrageenan induced hind paw edema and

Histamine included hind paw edema method (Kolhe et al., 2011). It is also considered as bioenergy crop.

The plant has the following uses: (Ashok Kumar et al., 2013). The leaves are used as diuretic. The pollen is Astringent, Desiccant, Diuretic, Haemostatic and it is used in the treatment of nose bleeds, Haematemesis, Haematuria, Uterine, Bleeding, Dysmenorrheal, Post Partum Abdominal Pain and Gastralgia, Scrofula and Abscesses. The root stock is astringent and diuretic and it is contraindicated for pregnant women. The seed down is Haemostatic and it is used for inducing labor and it is also used in acute experimental Myocardial Infarction in rabbits. The extract of the pollen from *Typha angustata* has ability to enhance the osteoinductive potential of demineralized

bone matrix. *Typha angustata* used in the study of acid mine water of wetlands.

In our present study we aimed to prepare a hydroalcoholic extract of rhizomes of the plant followed by preliminary phytochemical screening to identify different phytoconstituents and evaluating the antimicrobial activity of the extract by agar plate diffusion method using amoxicillin as the standard.

Materials and methods

All the chemicals were obtained from various chemical industries from Mumbai and Borosil glassware were used.

Extraction of Phytochemicals

A hydro alcoholic extract of rhizomes of this plant was prepared by soxhlet method using a mixture of equal quantity of ethanol and water (50:50). The solvent was distilled off and the crude extract was dried in a dessicator for overnight to get it in powdered form. This powder was subjected to preliminary phytochemical screening as per the standard protocol followed in practical pharmacognosy book (Kokate .,2005) to identify the phytoconstituents which were listed in (Table 1) and to perform antibacterial activity.

Screening for anti-microbial activity:

The potato dextrose agar medium plates were prepared and inoculated with strains of gram positive bacteria *Staphylococcus aureus*, *Bacillus subtilis* and gram negative bacteria *Escherichia coli*, *Pseudomonas aeruginosa*. The extract was added to these plates in 500 mcg/ml, 750 mcg/ml and 1000 mcg/ml using DMSO as the solvent against Amoxicilline as the standard. These plates were incubated at 37°C for 24 hours in an incubator. After the incubation period the plates were taken out of the incubator and zones of inhibition were measured in millimeter. The results were as shown in (Table 2 & Figures[A-H]).

Results and Discussion

The preliminary phytochemical screening of hydroalcoholic extract of selected species showed the presence of alkaloid, steroid, tannins, saponins and vitamin c mentioned in table 1.

Table 1: Phytoconstituents present in the Hydro alcoholic extract

Name of the Phytoconstituents	Hydro alcoholic extract
Carbohydrates	+++
Proteins/ Amino acids	–
Volatile oils	–
Steroids	+++
Glycosides	–
Alkaloids	+++
Flavanoids	–
Phenol/ Tannins	+++
Saponins	+++
Vitamin A	–
Vitamin D	–
Vitamin C	+++

(+) present; (–) = absent.

The hydroalcoholic extract of rhizomes of *Typha angustata* is taken for the antibacterial against *B.subtilis*, *P.aureginosa*, *E.coli* and *S.aureus*. The agar-plate method was adopted to screen the activity at various concentrations. The study observed that 1000µg/ml of extract showed comparable and significant activity against the microorganism used in this study. The results were shown in table 2 and figures A, B, C, D, E, F, G and H. Here, the study confirms that the saponin and tannins may be attributed for the antibacterial activity of the *Typha angustata* (Jeffrey, 2003).

Conclusion

The hydro alcoholic extract of rhizomes of *Typha angustata* was prepared by soxhlet method and subjected to phytochemical screening for the confirmation of phytoconstituents. The extract was screened for

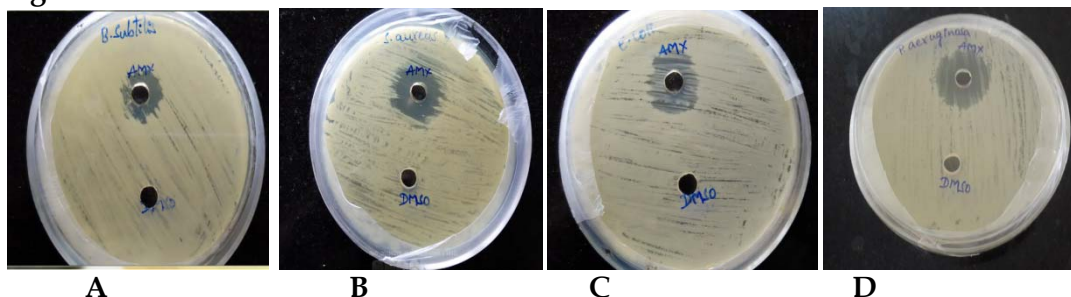
anti-microbial activity in vitro at different concentrations. The extract showed significant anti-microbial activity at 1000 µg/ml against gram positive and gram

negative bacteria used in the study to indicate the antimicrobial activity of rhizomes.

Table 2: Zone of inhibition of growth of micro-organisms

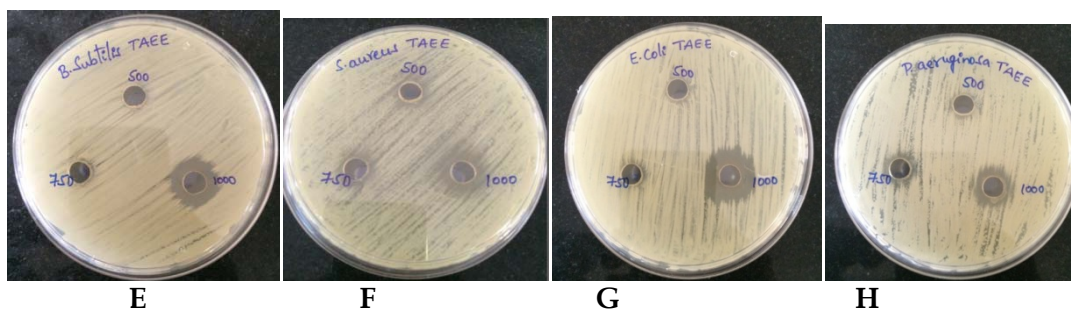
Organism	500 µg/ml	750 µg/ml	1000 µg/ml	Amoxicilline (100 µg/ml)
<i>B. subtilis</i>	7mm	10mm	17mm	30
<i>S. aureus</i>	13mm	14mm	16mm	18
<i>E. coli</i>	9mm	11mm	20mm	23
<i>P. aeruginosa</i>	8mm	11mm	16mm	25

Figures:



Zone of inhibition of standard (positive control), DMSO (solvent negative control).

- A: Zone of inhibition of growth of *B.subtilis* against Amoxicillin, solvent DMSO
- B: Zone of inhibition of growth of *S.aureus* against Amoxicillin, solvent DMSO
- C: Zone of inhibition of growth of *E.coli* against Amoxicillin, solvent DMSO
- D: Zone of inhibition of growth of *P.aureginosa* against Amoxicillin, solvent DMSO



Comparative zone of inhibition of *Typha angustata* (L.) rhizome.

- E: Zone of inhibition of growth of *B.subtilis* against hydro alcoholic extract of rhizomes of *Typha angustata* at 500, 750 and 1000mcg/mL.
- F: Zone of inhibition of growth of *S.aureus* against hydro alcoholic extract of rhizomes of *Typha angustata* at 500, 750 and 1000 mcg/mL.
- G: Zone of inhibition of growth of *E.coli* against hydro alcoholic extract of rhizomes of *Typha angustata* at 500, 750 and 1000mcg/mL.
- H: Zone of inhibition of growth of *P.aureginosa* against hydroalcoholic extract of rhizomes of *Typha angustata* at 500, 750 and 1000 mcg/mL.

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