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## **Anthelmintic Activity of Ethanolic Extract of *Streblus Asper* against *Pheretima Posthuma***

**Anil Kumar\*, K. Saravanan***Bhagwant University, Shikar Road, Ajmer, Rajasthan, India*

### **ABSTRACT**

Among the most common infections of digestive system in human beings are helminth infections. In developing countries they pose a large threat to the society. Such parasitic diseases cause severe morbidity, including lymphatic Filariasis, onchocerciasis and schistosomiasis. The present paper deals with anthelmintic activity of leaves of *Streblus asper* belonging to family Moraceae, a potential medicinal plant. The plant is used in traditional medicine for folk medicine for the treatment of different ailments such as Filariasis, Leprosy, Tooth ache, Diarrhea, Dysentery, and Cancer. The ethanolic and aqueous extracts were evaluated for its anthelmintic activity against adult Indian earth Worms (*Pheretima posthuma*). Three concentrations (25, 50 and 100 mg/ml) of each extract were studied, which involved for the determination of time of paralysis and time of death of the test worms. It was found that ethanolic extracts exhibited significant anthelmintic activity while aqueous extract show least activity. The bioassay involved determination of the time of paralysis and time of death control. Piperazine citrate (10 mg/mL) was used as standard reference drug

**Keywords:** Anthelmintic activity, *Pheretima posthuma*, Piperazine citrate, *Streblus asper*,

\*Corresponding Author Email: [howruakpatel@gmail.com](mailto:howruakpatel@gmail.com)

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## INTRODUCTION

*Streblus asper* (family-Moraceae) is a small tree which is indigenous to tropical countries such as India, Srilanka, Philippines and Thailand. In India it is distributed in the Himalayas from Himachal Pradesh to West Bengal and in hills and plains of Assam and Tripura. It is also found in the drier parts of India. Various parts of this plant are used in Ayurveda and other folk medicine for the treatment of different ailments such as Filariasis, Leprosy, Tooth ache, Diarrhea, Dysentery, and Cancer. Root is used as an application to the unhealthy ulcers and sinuses, and as antidote to snakebite, in epilepsy and obesity. Stem is used in toothache, Stem bark is given in fever, dysentery, diarrhea, stomach ache, urinary complaints, piles, edema and wounds. Decoction is effective against lymphodema, chylurea, and other effects of Filariasis. Leaves are used in eye complaints; milky juice is used as antiseptic, astringent, applied to chapped hand and sore feet, in pneumonia and swells of cheeks. The other part which is not specified is used in cancer, cholera, colic, diarrhea, dysentery, epilepsy and inflammatory swellings. The branch of *Streblus asper* has been used as tooth brush for strengthening teeth and gums. *Streblus asper* extracts thus has the potential for being used as a natural product for controlling dental carries. *Streblus asper* is a rigid shrub or gnarled evergreen tree; bark light grey and a rich source of cardiac glycosides. More than 20 cardiac glycosides from the root bark of *Streblus asper* have been reported and were able to structurally characterize about 15 such compounds, kamloside, asperosides, trebloside, glucokamloside, glucostrebloside, Strebloside, and  $\beta$ -sitosterol were reported.

## MATERIAL AND METHOD

### Collection of Plant Material:

The leaves of *Streblus asper* were collected in locally from local area of Azamgarh, Uttar-Pradesh, India in the month of September and were authenticated by Professor Dr. N. K. Dubey Taxonomist, centre of Advanced study in botany, institute of science, Banaras Hindu University, Varanasi (India) as *Streblus asper* (Moraceae) leaves. A voucher specimen has been kept in the herbarium (voucher specimen no. mora. 2019/1). Department of botany. The leaves were dried under shade and coarsely powdered.

### Drugs and chemicals

All the chemicals and reagents were procured from S. D. Fine Chemicals (Mumbai, India). All the chemicals were of analytical grade. The drug Piperazine citrate was procured from Glaxo Smithkline Ltd, Mumbai.

### Preparation of extracts

The *Streblus* leaves were cut into small pieces and air dried for 48-72 h. Dried leaves were ground into a fine powder. Coarsely powdered material (500 g) was extracted successively with

ethanol and water by maceration process at room temperature for three days. Then all the extracts were filtered and concentrated with a rotary evaporator and kept in a refrigerator.

#### Animal:

Healthy adult Indian earthworms, *Pheretima posthuma*, due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings were used in the present study. All earthworms were of approximately equal size (15 cm). They were collected from local moist place, washed and kept in water.

#### Study of Anthelmintic activity

The assay was performed on adult Indian earthworm *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal round worm parasite of human being. Five groups of Indian earth worms each containing six earthworms approximately of equal size was used for the study. Each group of earth worms were tested with different extract conc. (25, 50 and 100 mg/mL), distilled water (Control), and reference standard Piperazine citrate (10 mg/mL in distilled water). Observations were made for the time taken for paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water at 50 °C followed with fading of their body color.

## RESULTS AND DISCUSSION

Preliminary phytochemical screening of different extracts of leaves of *Streblus asper* revealed the presence of alkaloids, flavonoids, tannins and Saponins. Tannins and polyphenolic compounds were shown to produce anthelmintic activities. In the present study, it was observed that all the extracts of *Streblus asper* leaf have exhibited positive response to certain degree of anthelmintic activity. Extracts exhibited more potent activity at higher concentration (100 mg/mL) against *Pheretima posthuma* (earthworm). Evaluation of anthelmintic activity was compared with reference standard Piperazine citrate as shown in Table.1.

**Table 1: Anthelmintic activity was compared with reference standard Piperazine citrate**

| S. No | Extract            | Conc. (mg/ml) | Paralysis (min) | Death (min)  |
|-------|--------------------|---------------|-----------------|--------------|
| 1     | Vehicle            | .....         | .....           | .....        |
| 2     | Piperazine citrate | 10            | 19.36 ± 0.87    | 61 ± 0.68    |
| 3     | Ethanolic          | 25            | 18.16 ± 0.65    | 61.83 ± 1.32 |
|       |                    | 50            | 11.32 ± 0.51    | 28.10 ± 0.81 |
|       |                    | 100           | 5.47 ± 0.40     | 15.06 ± 0.40 |
| 4     | Aqueous            | 25            | 29.53 ± 0.79    | 86.83 ± 1.72 |
|       |                    | 50            | 19.5 ± 0.42     | 42.83 ± 1.16 |
|       |                    | 100           | 14 ± 0.25       | 33.66 ± 1.43 |

Values are expressed as Mean ± SEM (n = 6)

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