

SCREENING OF *TRICHOSANTHES DIOICA* FRUITS
FOR ITS ANALGESIC ACTIVITY

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Summary

The present study was taken to give the scientific validation of folklore medicinal use of *Trichosanthes dioica*. The analgesic activity of methanolic and aqueous extract of fruit of *Trichosanthes dioica* was evaluated using tail immersion method in rats. The rats were evaluated for the pain threshold at different interval of time up to 180 minutes. The methanolic extract shows moderate activity at 180 min (5.46 ± 0.014) while aqueous extract shows significant activity at 180 min (5.94 ± 0.004). The results support the traditional use of this plant in some painful and inflammatory conditions.

Key words: *Trichosanthes dioica*, Analgesic, Tail immersion method.

Introduction

Trichosanthes dioica Roxb. (Cucurbitaceae), called pointed gourd in English, *Potol* in Bengali, *Palval* in Hindi and *Patola* in Sanskrit is a dioecious climber found wild throughout the plains of North and North-East India from Punjab to Assam and Tripura. It is cultivated for its fruits, a common culinary vegetable in India. In India all parts of this plant has been traditionally used for various medicinal purposes. According to Ayurveda, the leaves are antipyretic, anthelmintic, aphrodisiac, cholagogue, aperient, tonic, digestive and antibilious and used as expectorant, bitter tonic, laxative, alternative and in the cases of bilious fever, in sub-acute cases of enlarged liver and spleen, haemorrhage, fistula-in-ano, fevers, leprosy, intrinsic haemorrhage, erysipelas, alopecia, diseases of mouth, inflammations and wounds¹⁻⁴. The leaves and tender shoots are used as culinary spinach in West Bengal and Assam, called as *Palta* in Bengali.

Fruits of *Trichosanthes dioica* are a rich source of vitamin C and minerals such as 9.0 mg Mg, 2.6 mg Na, 83.0 mg K, 1.1 mg Cu, and 17.0 mg S per 100 g. In addition, fruits and other parts such as leaves and tender shoots have been used in the indigenous system of medicine since ancient times⁵. Recently, in normal animals, some specific medicinal properties have also been identified, viz., hypocholesterolemic, hypoglyceridimic, and hypophospholipidemic, by mixing shade-dried fruits of *Trichosanthes dioica* in animal food^{6, 7} and, also, by direct intake of fruit and pulp in normal and diabetic human volunteers⁵. Direct feeding of seeds of the plant was also found to be effective on serum lipid profile of normal and mild diabetic human subjects⁸ and albino rabbits⁹. Effect of the seed fruit powder of *Trichosanthes dioica* has also been studied on blood sugar and lipid profile of normal albino rabbits¹⁰. Seeds of the plant were also found to possess antifungal and antibacterial activity and are widely used in the treatment of acid dyspeptic diseases¹¹.

The purpose of the present study was, therefore, to evaluate the analgesic effect of the *Trichosanthes dioica* fruit extract using tail immersion method of pain in rats. The extract was also studied for its acute toxicity effects and preliminary phytochemical screening.

Materials and Methods

Collection of Plant material:

The fruits of *Trichosanthes dioica* were collected from the local area of Bardoli, India and were authenticated by the botanist. The voucher specimen was kept in the college museum.

Extraction of Fruits:

The shade dried fruits of *Trichosanthes dioica* were reduced to fine powder (# 40 size mesh) and around 200 gm of powder was subjected to successive hot continuous extraction (soxhlet) with methanol. Finally the drug was macerated with chloroform water. After the effective extraction, the solvents were distilled off, the extract was then concentrated on water bath and the extract obtained with each solvent will be preserved.

Animal selection:

Albino rats of either sex weighing 150 to 200 g were selected for the experiment. They were employed for assessing analgesic activity. Rats were divided into four groups, each group having six animals. The bedding material of the cages was changed every day.

Materials:

Extract used

- a) Methanol extract of *Trichosanthes dioica*
- b) Aqueous extract of *Trichosanthes dioica*
- c) Standard: Pentazocin. (FORTWIN ,Ranbaxy, India)

Dose selection:

- a) Methanol extract of *Trichosanthes dioica* (300 mg/kg b.wt)
- b) Aqueous extract of *Trichosanthes dioica* (300 mg/kg b.wt)
- c) Control: 5 ml/kg of 5% gum acacia. (p.o.)
- d) Standard: Pentazocin 5 mg/kg body weight (i.p.)

Method:

The analgesic responses of the given samples of extracts were evaluated using the Tail immersion method¹² using analgesiometer.

In this method the rats were divided into four groups (each group containing six animals). The first group was served as control and received 5% acacia solution only (5ml/kg bd wt, orally.), second group of animals was served as standard and administered standard drug Pentazocin (5 mg/kg bd wt., i.p.). The animals of remaining groups were treated with different extracts. The analgesic responses of the fruit extracts were evaluated using the tail immersion method. In this procedure the albino rats were weighed and marked. They are placed into individual restraining cages leaving the tail hanging out freely. The animals are allowed to adapt to the cages for 30 min before testing. The lowest 5 cm portion of the tail is marked. This part of the tail is immersed in a cup of freshly filled water of exactly 55 °C. Within a few seconds the rat reacts by withdrawing the tail. The standard, test and control doses were injected to the animals and the reaction time was noted at 0, 30, 60, 90, 120 and 180 minutes.

All data were expressed as Mean \pm SEM and analyzed statistically by using Dunnett's *t*-test. A difference was considered significant at P value less than 0.05.

The results have been shown in Table No.1 and Figure No.1.

Result and Discussion

This present study was carried out to assess the validity of the folkloric use of this plant in the management of pain threshold. Both *in-vivo* and *in-vitro* methods are available for the evaluation of analgesic agents but among the *in-vivo* methods tail immersion method is believed to be one of the most reliable and also the most widely used.

From the results obtained it is concluded that aqueous extract of *Trichosanthes dioica* and methanolic extract of *Trichosanthes dioica* shows moderate activity, while after 90 min aqueous extract of *Trichosanthes dioica* shows the significant activity while in case of methanolic extract of *Trichosanthes dioica* shows moderate analgesic activity. Still it is a preliminary study it requires the molecular level study to find out the responsible chemical constituent for the analgesic effect.

Table No.1 Analgesic activity of various extracts of *Trichosanthes dioica*.

SL. NO.	GROUP	0 min.	30 mins.	60 mins.	90 mins.	120 mins.	180 mins.
		MEAN ± SEM					
1	Control	1.49 ± 0.012	1.47 ± 0.023	1.48 ± 0.015	1.43 ± 0.020	1.85 ± 0.019	2.78 ± 0.031
2	Standard	1.71 ± 0.030	1.83 ± 0.020	2.11 ± 0.017	2.39 ± 0.026	3.26 ± 0.006	5.73 ± 0.071
3	Methanol extract of TD	1.51 ± 0.011	1.74 ± 0.009	1.96 ± 0.018	2.24 ± 0.016	3.28 ± 0.030	5.46 ± 0.014
4	Aqueous extract of TD	1.28 ± 0.027	1.65 ± 0.007	2.02 ± 0.015	2.64 ± 0.039	3.21 ± 0.009	5.94 ± 0.004

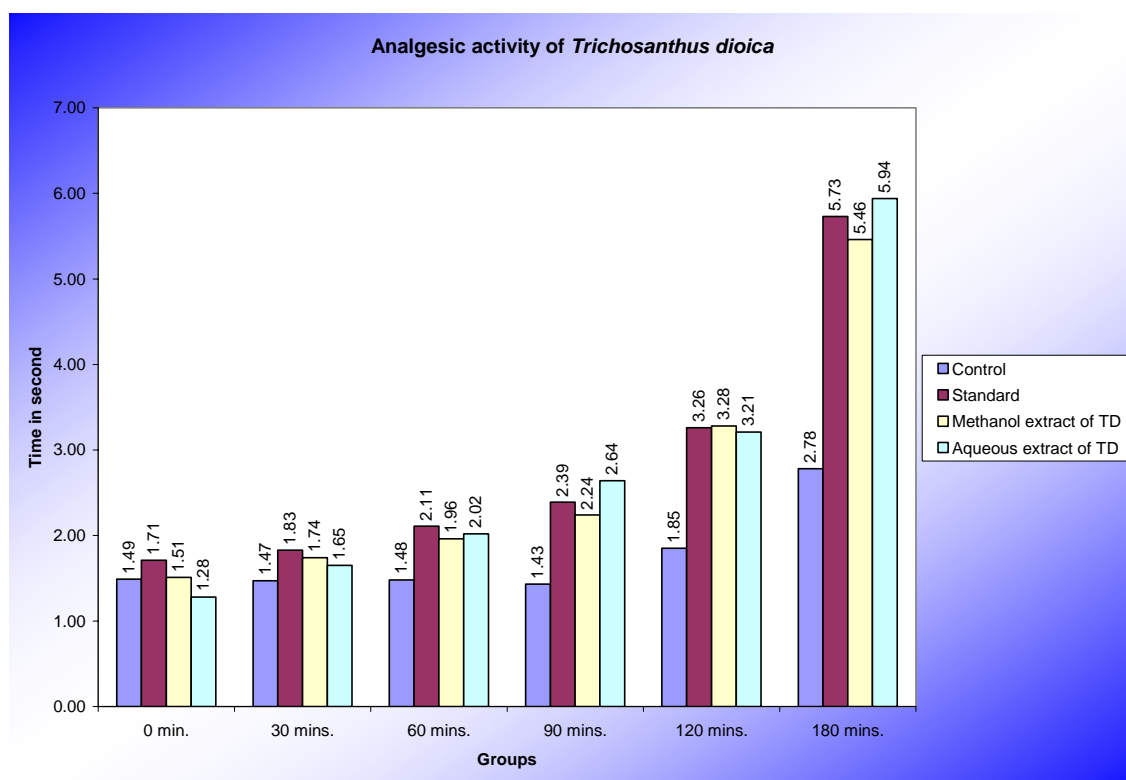


Figure 1: Analgesic activity of *Trichosanthes dioica*

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