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Antiepileptic activity of aqueous extract of *Tricosanthes dioica* Roxb.

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ABSTRACT

The antiepileptic efficacy of aqueous extract of fruits of Tricosanthes dioica was evaluated by hand limb extension induced by MES and PTZ induced seizures in mice models. The aqueous extract was found to possess significant antiepileptic activity in both models and it was found to be due to activity against generalized tonic- clonic and coritical focal seizures.

Key Words: *Tricosanthes dioica*, antiepilepsy, hand limb extension induced by MES method and PTZ induced seizures method.

INTRODUCTION

Tricosanthes dioica, a member of family Cucurbitaceae is well known as Parwal or Pointed Gourd. The plant is distributed wildly in the plains of North India from Punjab to Assam. It is also cultivated all over the warmer region of India particularly in Uttar Pradesh, West Bengal and Assam for its fruits [1]. Parwal fruits are source of vitamin-C, vit-A, tannins, saponins and tricosanthin [2, 3].

Tricosanthes dioica fruits are easily digestible and diuretic in nature. They have antiulcerous effects. The fruits & seeds have some haemagglutinating activities [4]. In indigenous system of medicines, parwal is used to treat epilepsy, alopecia, skin diseases and diabetes mellitus [5].

According to Ayurveda the plant is used as antiepileptic, laxative, cardiotonic, antifungal and antibacterial. There are some reports showing that te potential antioxidant, wound healing, hepatoprotective, antidiabetic activity of *Tricosanthes dioica* [6]. Since enough scientific data is not available on antiepileptic activity of fruits of Tricosanthes dioica, we have undertaken this work to validate the same.

MATERIALS AND METHODS

Plant material

The fruits of *Tricosanthes dioica* were collected from Meerut, Uttar Prades, India. It was identified and authenticated by Dr. Pradheep, Seniour Scientist, National Bureau of Plant Genetic Resources, New Delhi. The voucher specimen NHCP/NBPGR/2011-17/7261 was deposited at Department of Pharmaceutical Technology MIET, Meerut for future reference.

Animals

Albino mice(20-25g) of either sex were obtained from the animal house in Meerut Inst. of Eng. & Technology, Meerut. All the animals were maintained in a well ventilated room under ambient laboratory temperature and relative humidity, given access to feeds and water *adlibitum*. All experimental procedures were approved by the departmental animal use committee for the purpose of Control and Supervision on Experiments on Animals (CPCSEA) (Approval No. 711/02/a/CPCSEA).

Extract

The fruits of plant were dried in shade, separated and made to dry powder. It was then passed through 40 mesh sieve. A weighed quantity (300 mg) of the powder was macerated with hot water for 48 hours to get the aqueous extract of *Tricosanthes dioica* Roxb. fruits. The aqueous extract was concentrated to dryness using Rotary evaporator. Percentage yield was found to be 13.49 % w/w.

Preliminary Phytochemical Screening

The aqueous extract was then subjected to qualitative Phytochemical screening for the identification of different phytoconstituents. Aqueous extract showed positive tests for the presence of glycosides, saponins and alkaloids. As traditionally, the plant is used to cure epilepsy, the antiepileptic activity of the aqueous extract of the plant in different dose levels (100, 200 and 400 mg/kg) [7].

Anticonvulsant activity

Maximal ElectroShock induced seizures

Maximal electroshock seizure model was used to evaluate the anticonvulsant activity of aqueous extract. Seizures were induced in mice by delivering electroshock of 50 mA for 0.2 sec. by means of an electro- convulsometer through a pair of ear clip electrodes [8]. The test animal (n=6) received 400 mg/kg b.w. of aqueous extract orally and standard group received phenytoin (25 mg/kg) injected i.p [9] and tested after 30 minutes for MES induced seizure response. All the experimental groups were compared with the control treated with vehicle.

Pentylenetetrazole (PTZ) induced seizures

PTZ at the dose of 80 mg/kg was injected i.p. to induce tonic-clonic convulsions in mice. The animal (n=6) received 400 mg/kg if aqueous extract orally and standard group received Phenytoin (25 mg/kg) injected i.p. PTZ was injected i.p. 60 min. after the administration of drug. Occurrence of HLTE (Hind Limb Tonic Expens) and duration seizure were noted [8].

Statistical Analysis [10]

All the results obtained from various activities, as described above, were analyzed statistically by using Student's t test and $p<0.05$ were considered significant. The results are summarized in the tables given below.

RESULT

Table 1: Effect of different doses of aqueous extract of Tricosanthes dioica Roxb. fruits on hind limb extension induced by MES in mice

SI. No.	Group	Dose(mg/kg)	Hind Limb Extension (Mean± SEM)
1.	Control		13.83± 0.7924
2.	Phenytoin	25	1± 0.5164[a]
3.	Test	400	2.5± 0.4282[a]

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

[a] p <0.001 as compared to control.

Table 2: Effect of different doses of aqueous extract of Tricosanthes dioica Roxb. fruits on PTZ induced seizure in mice

SI No.	Group	Dose (mg/kg)	Onset time (sec.)	Duration of HLTE (sec.)
1.	Control		53.16± 1.0463	34.83± 1.7224
2.	Phenytoin	25	0± 00[b]	0± 00[b]
3.	Test	50	57.33± 0.7602	26.5± 0.7639[b]

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

[a] p <0.01, [b] p <0.001 as compared to control.

DISCUSSION

It was found from the above observations that *Tricosanthes dioica* Roxb. has shown anticonvulsant activity against seizures induced by MES. It was effective against MES induced seizures, since inhibition of the MES test predicts activity against generalized tonic-clonic seizure and coritical focal seizures [11]. The administration of PTZ in the present study induced Straub's tail phenomenon, followed by jerky movements of the whole body and convulsions in PTZ treated control group animals along with an increase on the percentage mortality of mice. PTZ is a chemoconvulsant, which induces seizures by the inhibition ob GABA-A receptors and it is widely accepted experimental model for absence seizure [10]. The results obtained from the study suggest that the aqueous extract of *Tricosanthes dioica* Roxb. fruits have anti-convulsant property and the results verify its traditional use in epilepsy.

CONCLUSION

Many people with epilepsy lead productivity and outwardly normal lives. Advanced brain scans and other techniques allow greater accuracy in diagnosing epilepsy and determining when a patient may be helped by a surgery. More than 20 different medications and a variety of surgical techniques are now available and provide good control of seizure for most people with epilepsy. Other treatment options include ketogenic diet and the first implantable device, the vagus nerve stimulator. Research on the underlying causes of epilepsy, including identification of genes for some forms of epilepsy and febrile seizures, had led to a greatly improved understanding of epilepsy that may lead to more effective treatment or even new ways of preventing epilepsy in the future. *Tricosanthes dioica* Roxb. fruits shows significant antiepileptic activity.

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