



EVALUATION OF ANTI-EPILEPTIC ACTIVITY OF SEED EXTRACT OF ENTADA PURSAETHA DC IN WISTAR RATS.

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ABSTRACT

There are substances or ingredients or drugs that are not specifically mentioned or categorized in classical Ayurvedic texts. These are called Extra pharmacopoeial drugs. *Entada pursaetha* DC is a large woody vine belonging to the family Mimosaceae. In some regions of India, it has been associated with folklore and traditional beliefs. In this study, the anti-epileptic activity of ethanolic seed extract of *Entada pursaetha* DC in the doses of 200mg/kg and 400mg/kg respectively using Maximal Electroshock induced convulsions (MES models) were investigated in Wistar rats. The ethanolic extract of Seed does not have any anti-epileptic property and did not show any significant results in either the doses 200mg/kg and 400mg/kg.

Keywords: Extra pharmacopoeial, *Entada pursaetha* DC, anti-epileptic, MES.

INTRODUCTION

There are substances or drugs which are unexpressed or unspecified and are not precisely documented in the classical texts of ayurveda and are known as Extra pharmacopoeial drugs. As Ayurveda evolves and comprise new findings, there are herbs that do not incline within the traditional categorization but are still considered beneficial for health. There are drugs which are not native to India and are not included in the Ayurvedic texts, but they are used as source of food, medicine and other life supporting activities by tribes of different parts of the country. These drugs can be included into ayurvedic pharmacopeia by interacting with the tribals, studying the way they use them and incorporate them in their food and medicinal regimen and later by evaluating the properties of drug scientifically and experimentally^[1].

Entada pursaetha DC belongs to the family Mimosaceae, which is commonly known as 'African dream herb or Snuff box sea bean', a gigantic trailing plant which produces long pods.

Synonyms of *Entada Pursaetha* DC:

1. *Entada scandens* auct. non Benth
2. *Entada monostachya* DC

Vernacular name of *Entada pursaetha* DC:

- English: African dream herb, Snuff box sea bean.
- Hindi: Garud Pustak
- Telugu: Gilla teega, Killa theega, Gurrupu kaya
- Marati: Garbi, Garambi
- Kannada: Gardaala
- Malayalam: Kakavalli
- Mizo: Kawi-hrui.

Morphology:

Habitat: common along river and stream sides of evergreen forests of south Africa, Sri Lanka, China, Malaysia. In India it is found in eastern and western ghats.

Habit: It is a gigantic climber with twisted angled stems.

Leaf: Dark green, bi-pinnate leaves, glabrous and grooved leaf-rachis ending with bifid tendril, pinnae 2-3 pairs, leaflets 3-4 pairs, up to 9*4 cm, ovate-oblong, obtuse of emarginated at apex.

Inflorescence: Spikes up to 30cms long from the axils of upper leaves or from nodes on the leafless branches.

Flowers: Small, polygamous, pale yellow in colour.

Fruit: Pod, huge up to 2 meters long, compressed, woody, 6-15 jointed.

Seed: Flat, round disc shaped, 5 cm in diameter, smooth glabrous brown, testa is hard.

Many tribal communities like Valmiki, Chenchus, Yanadi, Konda reddy, jatapus and others utilize this plant species for multiple purposes. The seeds are considered narcotic, tonic, emetic, anthelmintic, anti-pyretic. It is also used in the soap making industry. Raw cotyledons eaten for killing intestinal worms. Bark is used in skin diseases and ulcers, leaves are used to treat infantile cold, root paste is used in epilepsy. It is mentioned as an antiepileptic drug and specific plant part was not mentioned in S K Jain 2015. This experiment was done to evaluate the antiepileptic activity of seed of *Entada pursaetha* DC. [2,3,4,5]

Epilepsy is the condition of recurrent, unprovoked seizures. Epilepsy has numerous causes, each reflecting the underlying brain dysfunction. It is one of the most common neurological conditions, with an incidence of approximately 50 new cases per year per 100,000 population. Approximately 75% of epilepsy begins during childhood, reflecting the heightened and susceptibility of the developing brain to seizures [6].

Materials and methods:

Plant material:

In the present study, the seeds of *Entada pursaetha* DC were collected from Tirupati, thalakona region, chittoor district, Andhra Pradesh. The seeds are authenticated from Botanist Dr Goli P Pratap, National Research Institute of Unani Medicine for Skin Disorders, Hyderabad.

Toxicological Study:

Entada pursaetha DC ethanolic extract was previously evaluated for acute and sub-acute toxicity in wistar rats, which showed no toxicity haematologically and

physiologically. Ethanolic extract of the seed showed relative safety up to 2000mg/kg of body weight.^[8]

Preparation of extract:

Extraction was obtained by maceration procedure, where coarsely powdered seed was soaked in ethanol and kept macerating for 24 hours. Later the supernatant part is collected and heated in the rotavapor until the ethanol evaporated and the semi-solid extract is collected.

Animals:

Male Wistar rats weighing 200-250 g were housed in groups of 6 per cage at temperature 25° ± 1° C and relative humidity of 42.51%. A 12:12 light and dark cycle was followed during the experiment. Animals were kept for a period of 10 days for acclimatisation before carrying out the study. Animals had free access to food and water. The Institutional Animal Ethical Committee approved the protocol of the study. CCSEA Number:320.

Assessment of Anti-epileptic activity:

An imbalance between the excitatory and inhibitory neurotransmitters is responsible for seizures. The shift in the balance between the inhibitory GABA and the excitatory glutamate neurotransmission causes seizures^[11,12,13]. The MES is the best validated method for assessment of antiepileptic drugs in general tonic-clonic seizures.

Maximal electroshock induced seizures (MES)⁽¹⁴⁾

The animals were divided into four groups of 6 rats each. Group I received sodium CMC solution (p.o), group II received 100mg/kg of phenytoin (i.p), group III & IV received 200mg/kg and 400mg/kg of p.o ethanolic extract of seed of *Entada pursaetha* DC respectively. Maximal electroshock of 150mA current for 0.2 sec was administered through ear electrode to induce convulsions in all the groups of animals. MES produced various phases of convulsions i.e. Flexion, Extension, Clonus and Stupor & recovery. The reduction in the time or abolition of tonic extension of hind limb is taken as a protective action.

Statistical analysis:

The data are presented as Mean ± SEM. The data of MES test were analyzed by one way analysis of variance (ANOVA) followed by Tukey’s Multiple Comparison test.

RESULTS:

The result of anti-epileptic effect of *Entada pursaetha* DC plant against MES induced convulsions are shown in table no 1. The data resulted from anti-epileptic effect of 200mg/kg and 400mg/kg of doses of ethanolic extract of *Entada pursaetha* DC seed did not produce any significant change in any phase (flexion, extension, clonus) of MES induced seizures. On the basis of this observation *Entada pursaetha* seed had no effect in epilepsy.

Table No 1 – Effect of ethanolic extract seed of *Entada pursaetha* DC against MES induced convulsions.

Drug	Dose mg/Kg b.w	Time (Sec) in various phases of convulsions (Mean±SEM)				
		Flexion	Extension	Clonus	Stupor	Recovery
Control (Na CMC 1gm/Kg)	-	3.50 ± 0.342	11.0 ± 1.03	3.50 ± 0.670	185 ± 12.0	180 ± 15.5
Standard Phenytoin	100	4.50 ± 0.342	6.50 ± 0.428	9.66 ± 0.802	190 ± 18.4	190 ± 18.4
Ethanol extract (low dose)	200	4.67 ± 0.494	10.2 ± 0.833	7.00 ± 1.03	190 ± 24.1	250 ± 24.1
Ethanol extract (high dose)	400	2.50 ± 1.15	4.33 ± 2.03	3.83 ± 1.83	120 ± 15.5	120 ± 15.5

Values are expressed as Mean ± SEM one way ANOVA followed by Tukey’s post hac test. Here n = 6 in each group.

DISCUSSION

Most of the ayurvedic herbs mentioned in the classical ayurvedic texts are extinct or critically endangered, there is need to replace them with the herbs having same medicinal properties. The drugs or substances which are not mentioned in ayurvedic texts but are used for food and medicinal purposes in some diseases by some tribes of India, with those references, some plants can be used as substitutes for classical ayurvedic herbs after assessing them through ayurvedic ancient research techniques, extensive literature studies, toxicological studies, pre-clinical and clinical studies. *Entada pursaetha* DC plants which belong to the family Mimosaceae are used in many conditions like skin diseases, wounds, cough and epilepsy by the tribal communities. There are 5 phases in MES induced epilepsy 1. Tonic Convulsion 2. Tonic Extension 3. Clonic Convulsion 4. Stupor 5. Recovery. A drug is said to have anti-epileptic property if it reduces or abolishes the time spent in Tonic extension phase. In this study the Ethanolic extract of seed of *Entada pursaetha* DC did not reduce or abolish the tonic extension phase in both low (200mg/kg) and high (400mg/kg). Hence, ethanolic seed extract of seed of *Entada pursaetha* DC did not exhibit any significant anti-epileptic activity when tested in Wistar rats.

CONCLUSION

Ethanolic extract of seed of *Entada pursaetha* DC did not show any statistically significant anti-epileptic activity in Wistar rats. Hence, there is a need to evaluate the activity in other extracts of the seed and other parts of the plant in different doses and animal models.

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