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www.mcmed.us/journal/abs **Research Article**

ANTICONVULSANT ACTIVITY OF *CARYOTA URENS* LEAF EXTRACT AGAINST MAXIMAL ELECTROSHOCK INDUCED CONVULSION

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ABSTRACT

This study was aimed to evaluate the anticonvulsant activity of ethanolic leaf extract of *Caryota urens* maximal electroshock induced convulsion in mice. Ethanol (70%) was used as solvent to extract the phytoconstituents from *Caryota urens* leaves. The anticonvulsant activity was evaluated by MES model using 200 and 400mg/kg of ethanolic leaf extract of *Caryota urens*. Onset and duration of clonus seizure was observed after administration of *Caryota urens* before exposing the animals to MES. Diazepam was used as reference control. Both the doses of *Caryota urens* significantly reduced the onset and duration of clonus seizure and the percentage protection was also enhanced. Form the result it was concluded that, ethanolic leaf extract of *Caryota urens* exhibited anticonvulsant activity in mice against MES induced convulsion.

Keywords :- *Caryota urens*, Diazepam, Clonus seizure and Anticonvulsant.

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INTRODUCTION

Central nervous system plays a vital role in the physiological organization of the completely human body. In modern world, everyday people suffered by depression, anxiety, epilepsy and restlessness due to stress [1]. According to WHO report, about 450 million people suffer from a mental or behavioral disorder. This amounts to 12.3 % of the global burden of disease, and predicted to rise up to 15 % by 2020 [2]. While, majority of modern drugs synthetic agents causes side effects on like tiredness, weight gain, nausea, dry mouth, sexual dysfunction, amnesia, sedation, headache and wooziness [3]. The affinity towards the herbal drugs has been grown by utilization of traditional medicinal plant due to its safety and better alternative to synthetic drugs that assure numerous side effects during prolonged treatment [4]. Use of herbal medicine has been increased due to its safety and plays vital role in CNS disorders [5]. *Caryota urens*. Family: Arecaceae, is a underutilized palm species mainly distributed in several countries in south Asia: India, Sri Lanka, Malaysia and Indonesia to Philippines [6]. The

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palms are the most beneficial plants to people in the tropics. The urens is the principle phytoconstituent present in the *Caryota urens*, and others are flavanoids, phenolic compounds, amino acids, alkaloids, proteins and carbohydrate which may be responsible for the medical potential of the herb [7]. It is used in the treatment various neurodegenerative disorders, digestive system disorders, snake bite poisoning [8]. So far there is no scientific evidence for its use in central nervous functions especially as anticonvulsant. Current study is conducted to assess the influence of *Caryota urens* leaf extract on experimentally induced convulsion in laboratory animals.

MATERIALS AND METHODS

Plant Materials

Collection & Identification

The leaves of *Caryota urens* was collected from outskirts of Pondicherry. The plant was identified as *Caryota urens*and authenticated by the botanist, Botanical Survey of India, Agricultural University, Coimbatore. The voucher specimen (BSI/SRC/11/72/2017-18/Sci/01308) has been deposited in the herbarium for future reference.

Extraction of Plant Material

The collected *Caryota urens* leaves were, shade dried and grounded using mechanical blender to get coarse powder. The 200gm of coarsely powdered leaves of *Caryota urens* was soaked in one litre of ethanol (70%) in a tightly sealed flat bottom flask at room temperature, protected from sun light for 72 hrs with occasional shaking. After 72 hrs the mixture was filtered through muslin cloth and the solvent was evaporated by rotary evaporator at 40^{o}C to get dry mass. The dried ethanolic leaf extract of *Caryota urens* was stored in desiccators and used for further pharmacological studies.

Animals

The Swiss albino mice (18-22 g) of either sex were used for the study. The animals were obtained from animal house, of Kerala Veterinary and Animal Science University, Mannuthy. On arrival, the animals were placed at random and allocated to treatment groups in polypropylene cages with paddy husk as bedding. Animals were housed at a temperature of 24±2^{o}C and relative humidity of 30 – 70 %. A 12:12 light: day cycle was followed. All animals were allowed to free access to water and fed with standard commercial pelleted rat chaw (M/s. Hindustan Lever Ltd, Mumbai). All the experimental procedures and protocols used in this study were reviewed by the Institutional Animal Ethics Committee and were in accordance with the Institutional ethical guidelines.

Anticonvulsant Activity

Maximal Electro Shock Induced Convulsions:

The mice were considered a model of human absence epilepsy and myoclonic seizure. Thirty two Swiss albino mice were divided into four groups of six animals in each group. Group I, control animals were administered orally with 10ml/kg of 0.1% Carboxy methyl cellulose (CMC) solution and group II animals served as reference control, received diazepam (1 mg/kg, i.p). The animals of group III and IV were treated with ethanolic leaf extract of *Caryota urens* (200 & 400mg/kg) respectively through oral route. All the test drugs were administered 30 minutes before the commencement of the study. The electroshock induced in animals through passing a current of 45 mA for 0.2 sec duration through electro convulsion meter (Techno, India) using corneal electrodes. After treatment, the animals noticed for duration of convulsion induced by MES was recorded [9].

Statistical Analysis

Results are expressed as mean ± SEM. The datas are analyzed by using one way analysis of variance (ANOVA) followed by Dunnet's '*t*' test using GraphPad version 3. P values < 0.05 is considered as significant.

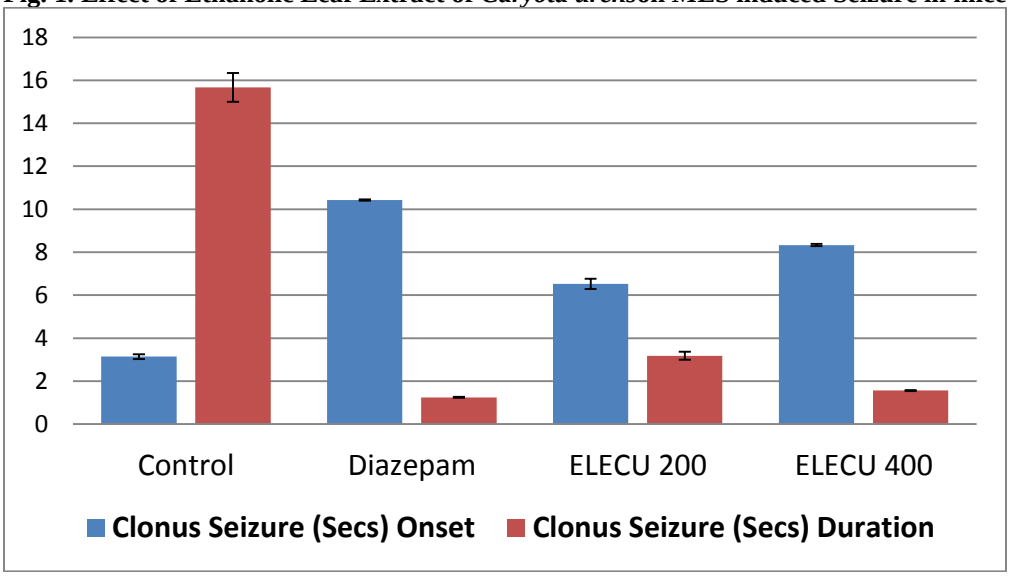
RESULTS

Table 1. Effect of Ethanolic Leaf Extract of *Caryota urens*on MES induced Seizure in mice

Groups	Drug Treatment	No. of Animals Survived / Total Animals Used	Clonus Seizure (secs)		% Protection
			Onset	Duration	
I	Control 0.1% CMC (10ml/kg, p.o)	0/8	3.14±0.11	15.67±0.67	Nil
II	Diazepam (4mg/kg, i.p)	8/8	10.42±0.03***	1.24±0.02***	100%
III	ELECU (200mg/kg, p.o)	3/8	6.52±0.24**	3.18±0.19***	62.5%
IV	ELECU (400mg/kg, p.o)	0/8	8.33±0.05***	1.56±0.02***	100%

Values are in mean ± SEM (n=8);
*P<0.05 , **P<0.01, ***P<0.001 Vs Control

Fig. 1. Effect of Ethanolic Leaf Extract of *Caryota urens*on MES induced Seizure in mice



The anticonvulsant activity of ethanolic leaf extract of *Caryota urens* on MES induced seizure was studied in mice and the results were given in the table 1 and Figure 1. In control group, the onset and durations of was 3.14±0.11 and 15.67±0.67 seconds respectively. All the animals showed convulsion and no animals survived in control group. In the reference control, all the animals survived and only in 2 animals the initial symptoms of clonus seizure was noticed with the duration of 1.24±0.02 seconds hind limb tonic extension. The diazepam significantly (P<0.001) decreases the both onset and duration of clonus seizure as compared to non treated groups. The Animals treated with ethanolic leaf extract of *Caryota urens* 200mg/kg , 3 animals were survived out of 8 animals and the % protection was 62.5%. In the 200mg/kg of ethanolic leaf extract of *Caryota urens*, The onset of clonus seizure was 6.52±0.24 and the duration of hind limb tonic extension was found to be 3.18±0.19 seconds. Ethanolic leaf extract of *Caryota urens* 200mg/kg, also significantly decreased onset (P<0.01) and duration (P<0.001) of seizure as compared to control group. In the animals treated with 400mg/kg of ethanolic leaf extract of *Caryota urens*, all the 8 animals were survived, and the % protections was 100%. In this group, the onset of clonus seizure was significantly increased (P<0.001) to 8.33±0.05 and it significantly reduced (P<0.001) the duration of hind limb tonic extension to 1.56±0.02 seconds. The effect produced by the ethanolic leaf extract of *Caryota urens* 400mg/kg was comparable with the effect of reference control diazepam.

CONCLUSION

From the result, it was concluded that, ethanolic leaf extract of *Caryota urens* exhibited anticonvulsant activity induced by Maximal Electroshock induced convulsion in mice.

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