Jaikumar S et al. / International Journal of Pharmacy & Therapeutics, 7(2), 2016, 53-56.

e- ISSN 0976-0342
Print ISSN 2229-7456

International Journal of Pharmacy & Therapeutics

Journal homepage: www.ijptjournal.com

IJPT

ANTICONVULSANT ACTIVIY OF OLEOGUM RESIN EXTRACT OF *COMMIPHORA WIGHTII* AGAINST PENTYLENETETRAZOLE INDUCED CONVULSION IN MICE

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ABSTRACT

The aim of the present study is to evaluate the anticonvulsant activity of oleogum resin extract of *Commiphora wightii* against Pentylenetetrazole (80mg/kg) induced convulsion in mice. The animals were divided into four groups of six animals each. Clonazepam (0.1mg/kg) was used as standard drug. 200 & 400 mg/kg of *Commiphora wightii* extract were tested against Pentylenetetrazole induced convulsion in mice. 30 minutes after the test drug administration, Pentylenetetrazole (80mg/kg) was administered by subcutaneous route to mice. The onset of convulsion, lethality and % protection were observed. The data's were analyzed using ANOVA followed by Dunnet's *t* test. The result showed that, 200 & 400 mg/kg of *Commiphora wightii* extract produced significant ($P<0.01$ and $P<0.001$, respectively) anticonvulsant property against Pentylenetetrazole induced convulsion in mice.

Key Words:- *Commiphora wightii*, Pentylenetetrazole, Anticonvulsant activity, Clonic Convulsion.

INTRODUCTION

Epilepsy is one of the most common afflictions of human beings (Muralidharan *et al*., 2009). It affects approximately 50 million people worldwide and accounts for about 1% of the global burden of disease (Reynolds, 2001). Epilepsy is coined from the Greek word "epilembanein" which means "to seize". It is a chronic neurological disorder affecting both sexes (Blume *et al*., 2001). It is characterized predominantly by recurrent and unpredictable interruptions of normal brain function, called epileptic seizures which arise due to sudden, excessive and rapid discharge of cerebral neurons in the grey matter of the brain.

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It is a diverse family of disorders, having in common an abnormally increased predisposition to seizures reflecting underlying brain dysfunction that may result from different causes (Fischer *et al*., 2005). Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral – based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well being (WHO, 2003). Natural products from folk remedies have contributed significantly in the discovery of modern drugs and are now considered an alternative source for the discovery of antiepileptic drugs with novel structures and better safety and efficacy profiles (Raza *et al*., 2003). *Commiphora wightii* (A.) Bhandari belonging to family Burseraceae. *Commiphora wightii* is a plant of immense medicinal importance. The name *Commiphora* riginates from the Greek words Kommi (meaning 'gum') and phero (meaning 'to bear').

The majority of the species yield a fragrant oleo-gum-resin following damage to the bark called "guggul". The plant is known as 'Indian bdellium' in English and as Guggal or Guggul in most of the Indian languages.

Traditional uses of guggul include anti-inflammatory, carminative, emmenagogue, hypoglycemic, antiseptic, apertif, astringent, sedative, stomachic, diaphoretic, diuretic, expectorant, anthelminthic, depurative, vulnerary, demulcent, aphrodisiac, liver tonic, anti-spasmodic and lithonotriptic (Watt, 1972). Modern therapeutic uses of guggul is targeted against rheumatoid arthritis, nervous diseases, hypercholesterolemia (Nityananda and Kapoor, 1971) leprosy, muscle spasms, skin disorders, hypertension, urinary disorders and as hypolipidemic and anti-oxidant (Singh et al.,1994). Research showed that oleo-gum-resin is effective against cardiovascular disease (Deng, 2007) and cancer (Xiao and Singh, 2008).

Despite the successful development of various new antiepileptic drugs in recent decades, the search for new therapies with better efficacy and tolerability remains an important goal. Due to the chronic nature of the disorder, compliance with therapy is a major problem for most patients because of the need for long term therapy coupled with unwanted effects ranging in severity from minimal effects like gingival hyperplasia to death from Aplastic anemia or hepatic failure (McNamara, 2006).

The treatment and control of diseases by the use of available medicinal plants in a locality will continue to play significant roles in medical health care implementation in the developing countries. It therefore becomes pertinent to validate the folkloric claims of *Commiphora wightii* as a potential antiepileptic agent and to provide scientific basis for its nervous disease claim.

MATERIALS & METHODS

Preparation of Oleogum Resin Extract

The resin from *Commiphora mukul* was collected by etching the bark during the month of December. The resin is then dried, ground and subjected to exhaustive extraction with ethyl acetate. The collected extracts are treated with an amount of charcoal equivalent to 5% of the starting weight of the resin. After charcoal elimination, the colourless solution is concentrated to obtain a thick paste, which is recovered with ethanol, and, after filtrating the insoluble matter, concentrated till complete solvent removal.

Animals: Healthy male Swiss albino mice weighing between 20 – 25 gm were used for this study. The animals were obtained from animal house, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry, India. 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 (932/a/06/CPCSEA) and were in accordance with the Institutional ethical guidelines.

Pentylenetetrazole (PTZ) Induced Seizures

Animals were divided in to four groups of six animals each. Group I referred as induced control received vehicle (1ml/kg). Group II served as reference control received Clonazepam (0.1mg/kg) as standard drug. Group III & IV served as test control, received 200 & 400 mg/kg of *Commiphora wightii* extract respectively. After 30 minutes of above drug treatment, clonic seizures were induced in mice by subcutaneous injection of 80mg/kg Pentylenetetrazole. The latency to the onset of clonic convulsions in non-protected mice and lethality during the following 24 hour was recorded and compared with those of vehicle treated control mice to assess the anticonvulsant activity (Bienvenu *et al*., 2002).

Statistical Analysis

The values were expresses as mean ± SEM. The data's were analyzed by ANOVA followed by Dunnet's *t* test using GraphPad version 3. $P<0.05$ was considered as significant.

RESULT

Anticonvulsant activity of *Commiphora wightii* oleogum resin extract on Pentylenetetrazole induced convulsion was studied in rats and the results were shown in table 1. The onset of clonic convulsion, number of animal survived and the percentage protection were observed in the study after the administration of test drugs. The occurrence of first convulsion was 227.29±8.32 seconds after Pentylenetetrazole administration and all the animals were died due to seizure. In clonazepam treated group, the convulsion was delayed and onset of clonic convulsion was 843.22±19.37 seconds and all the animals were survived which indicates that clonazepam protected the seizure induced by Pentylenetetrazole. The animals treated with 200 & 400 mg/kg of *Commiphora wightii* oleogum resin extracts delayed the onset of convulsion by 421.71±15.55 and 682.39±12.83 seconds respectively. Out of 6 animals in 200mg/kg and 400mg/kg of *Commiphora wightii* oleogum resin treated animals, 4 and 5 animals

respectively were survived. The percentage protection in reference control was 100%, in 200mg/kg of *Commiphora wightii* was 66.67% and in 400mg/kg of *Commiphora wightii* was 83.33%.

Table 1. Anticonvulsant activity of *Commiphora wightii* extract on Pentylenetetrazole induced convulsion in rats.

S.No	Drug Treatment	Onset of First Clonus (sec)	No of Animal Survived	% Protection
1	**Group I** Epileptic Control Pentylenetetrazole (80mg/kg)	227.29±8.32	0/6	-
2	**Group II** Reference Control PTZ + Clonazepam (0.1mg/kg)	843.22±19.37***	6/6	100
3	**Group III** PTZ +*Commiphora wightii* (200mg/kg)	421.71±15.55**	4/6	66.67
4	**Group IV** PTZ + *Commiphora wightii* (400mg/kg)	682.39±12.83***	5/6	83.33

Values are in Mean±SEM (n=6)
*P<0.05, *P<0.01, *P<0.001 Vs Epileptic Control

CONCLUSION

From the result it was concluded that, The *Commiphora wightii* oleo gum resin extract exhibited anticonvulsant property against Pentylenetetrazole induced convulsion in mice.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST:
The authors declare that they have no conflict of interest.

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