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Research Article

Comparison of the Antiepileptic Activity of *Commiphora Molmol* Leaves by Different Methods

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ABSTRACT

The objective of this study was to evaluate the antiepileptic activity of the leaves of *Commiphora molmol* in animal models. Acute toxicity studies were performed in rats after administration of the extract orally in graded doses. Antiepileptic activity was evaluated by using Maximum electroshock-induced convulsion and Pentylenetetrazole-induced convulsion at 250 mg/kg and 500 mg/kg dose. The phytochemical study of plant revealed the presence of carbohydrate, flavonoids, saponins and alkaloids and suggests that plant had antiepileptic property. The 500mg/kg dose showed more antiepileptic property than 250 mg/ kg of *C. molmol*. The present study concludes that leaf extract of *Commiphora molmol* showed more antiepileptic activity by Pentylenetetrazole-induced convulsion method in compared to Maximum electroshock-induced convulsion method.

Keywords: Antiepileptic activity, Maximum electroshock-induced convulsion, Pentylenetetrazole-induced convulsion

1. INTRODUCTION

Commiphora molmol is a tree in the Burseraceae family. It is one of the primary trees used in the production of myrrh, a resin made from dried tree sap. The tree is native to the Arabian peninsula [1].The oleo gum resin obtained from the stem of various species of *Commiphora* is traditionally used in incense and perfumes for treatment of various diseases.Commiphora resin is commonly called as "mur" or "myrrh". It is widely used for treatment of some inflammatory conditions [2] as an antipyretic, antiseptic, stimulant [3] and mouth wash.Anti-histaminic studies [4] were also verified on *Commiphora molmol*.

Commiphora contains volatile oil which contains heerabolene, acadinene, elemol, eugenol, cuminaldehyde, terpenes including furanodiene, furanodienone, curzerenone, lindestrene, 2-methoxyfuranodiene, and 3-epi-alpha-amyrin and a few other compounds [5]. Myrcene and *a*-camphorene, as well as a few steroids including Z-guggulsterol and I, II, III guggulsterol are also present [6]. The resin in myrrh is made up of alpha-, beta-, and gamma-commiphoric acids, heeraboresene, alpha-, and beta-heerabomyrrhols and commiferin [7]. The water soluble gum or mucilage content in myrrh is about 30 to 60 % [8]. It is mainly composed of acidic polysaccharide with galactose, 4-O-methyl-glucuronicacid, and arabinose in a ratio of 8:7:2, with approximately 18 to 20% proteins.It also contains ash, salts, sulphates, benzoates, malates, acetates of potassium [9], formic acid, acetic acid and many more constituents (Chem). Tannins are also found in myrrh [10]. According to the *PDR for Herbal Medicines, 2nd Edition*, some of the chief components in myrrh are sesquiterpenes. Sesquiterpenes are a large family of C15 -isoprenoid molecules found in plants, microbes, and some marine organisms.

2. MATERIAL AND METHODS

2.1. PlantMaterial

The leaves of *Commiphora molmol* were collected from local markets of Lucknow, Uttar Pradesh and were authenticated by CSIR recognized institute, National Botanical Research Institute (NBRI), Lucknow.

2.2. Animals

Healthy adult Wistar albino rats between 2 and 3 months of age and weighing about 200-250 g were used for the study. The animals were housed in polypropylene cages, maintained under standard conditions (12 h light: 12 h dark cycle; 27±1°C; 60% humidity). They were fed with standard rat pellet diet and water ad libitum. The Protocol followed was approved by Institutional Animal Ethics Committee (IAEC) under CPCSEA (NIECGEI/IAEC/05/2011) committee was taken before animal experimentation.

2.3. Preparation of extract

The leaves were dried, crushed to moderately coarse powder and stored in airtight container. The dried powdered drug was macerated using ethanol. Solvent from the extract was eliminated under reduced pressure and then dried extract was collected.

2.4. Acute toxicity studies

Acute toxicity study was carried out as per the guidelines set by Organization for Economic Cooperation and Development

(OECD) revised draft guidelines received from committee for the purpose of control and supervision of Experimental Animals (CPCSEA), Ministry of Social Justice and Empowerment, Govt of India. 1/10th of the LD-50 was taken as therapeutic dose [11].

2.5. Antiepileptic study

2.5.1. Maximum electroshock-induced convulsion in rats

The animals were divided into four groups (n=5) and Group I animals served as control receiving 1 ml of 5 % CMC p.o, Group II served as drug control receiving phenytoin 20 mg/kg, p.o and Group III and IV animals were administered with the polyherbal extract (PHE) at doses of 250mg/kg and 500mg/kg p.o for 15 days respectively. On the 15th day, seizures were induced to all the groups of animals using electro convulsometer. A 60 Hz alternating current of 150 milliamps intensity elicited maximal electro shock (MES) seizures for 0.2 second. A drop of electrolyte solution (0.9% NaCl) with lignocaine was applied to the corneal electrodes prior to application to the rats. This increases the contact and reduces the incidence of fatalities [12].

2.5.2. Pentylenetetrazole-induced convulsion in rats

Pentynyl tetrazole is a GABA-antagonist [13]. The method was given by Bastian in 1959.This method is the screening method of clonic convulsions. The PHE (250 and 500 mg/kg, p.o.), diazepam (4mg/kg,i.m.) and normal saline (10ml/kg, p.o.) was administered to groups of rats(n =5), 30 min before PTZ (85mg/kg, i.p.) and onset to forelimb clonic, as well as hind limb extension was recorded. The onset and number of deaths after showing tonic hind limb extension were also recorded. Animals were kept individually in different cages under observation for 1h [14].

3. RESULTS AND DISCUSSION

Phytochemical studies of the plant reported the presence of carbohydrate, flavonoids, saponins and alkaloids. Both maximum electroshock-induced convulsion and pentylenetetrazole-induced convulsion methods are very commonly used methods. The results obtained from these methods showed that oil extracted from the leaves of *Commiphora molmol* showed antiepileptic activity.

Table 1: Effect of leaf extract of Commiphora molmol and Phenytoin on Maximal Electroshock-induced Seizures in rats

Treatment(mg/kg)	Mean Onset of seizures (sec.)	Mean Recovery time (sec.)	Quantal Protection	% Protection
Control	130.6±4.02	184.4	1/10	10
Phenytoin(20mg/kg)	135.08	120.5	8/10	80
PHE(250mg/kg)	156.4±4.02 *	135.5±3.0*	5/10	50
PHE(500mg/kg)	170.5±6.02*	175±4.0*	5/10	50

Table 2: Effect of leaf extract of Commiphora molmol and Diazepam on pentylenetetrazole-Induced Convulsions in rats

Treatment(mg/kg)	Mean Onset of seizures (sec.)	Mean duration of seizure(sec.)	Quantal Protection	% Protection
Control	120.6±6.02	58.5	2/10	20
Diazepam(4mg/kg)	187.0±2.56	4	10/10	100
PHE(250mg/kg)	165±3.04*	20	8/10	80
PHE(500mg/kg)	175±4.00*	10	8/10	80

4. CONCLUSION

In conclusion, *C. molmol* extract was found to have marked anticonvulsant activity against pentylenetetrazole-induced convulsions, but was quite ineffective against MES-induced convulsions, it is possible that the bioactivity is mediated by a combination of two or more molecules. Further experiments are required to identify the active molecules(s) and their mechanism(s) of action.

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