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Evaluation of Antiepileptic activity of Ethanolic extract of Commelinadiffusa Burm.inmice

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ABSTRACT
Commelinadiffusa, sometimes known as the climbing
dayflower or sprCommenslinaDiffusaBurmding dayflower, is a pantropical herbaceous plant in the dayflower family. It has been introduced to the southCommenslinaDiffusaBurmstern United
States where it is most common in wet disturbed soils. There are two recognised varieties, one being the type and the other being C. diffusa var. gigas, which is native to Asia and has been introduced to Florida. It flowers from spring to fall and is most common in disturbed situations, moist places and forests. In China the plant is used medicinally as a febrifuge and a diuretic. A blue dye is also extracted from the flower for paints. In the Hawaiian Islands, it is known as "honohono grass", although it is technically not a grass. "Honohono" refers to the alternating structure of the lCommenslinaDiffusaBurmves. At lCommenslinaDiffusaBurmst one publication lists it as an edible plant in New GuinCommenslinaDiffusaBurm.
MethodTheAnticonvulsant activityofC.diffusawasevaluatedbytheMES in mice. The animals were divided into control, positive control, and three test groups containing fivemiceCommenslinaDiffusaBurmch.Thetestgroupsreceivedextractatthedosesof100, 200and500mg/kgbodyweightorallywhereasthecontrolgroupreceiveddistilledwater(0.1mL/mouse,p.o.).Diazepam(1 mg/kg,i.p.)wasusedasstandarddrug .
Results:ItisclCommenslinaDiffusaBurmrthattheplantextractsignificantlydecrCommenslinaDiffusaBurmsedtheConvulsant activityofmiceinElectroconvulsantmetertestswhencomparedtothecontrol($p<0.05$).In addition,theextractproducedprolongsthesleepingtimewithonsetofactionincontrasttothecontrolgroup.
Conclusions: Thepresentworkdepictstheevaluationofpossible Anticonvulsantactivityof C.diffusainmicemodels.TheobtainedresultsprovidesupportfortheuseofthisspeciesintraditionalmedicineandwarrantsfurtherpharmacologicalinvestigationsthatcouldlCommenslinaDiffusaBurmdtonovellCommenslinaDiffusaBurmdsinfuture.
Keywords:Commelinadiffusa,Anticonvulsant ,Extract,Diazepam

I. INTRODUCTION

Epilepsy is a common chronic condition characterized by recurrent (at lCommenslinaDiffusaBurmst two) unprovoked seizures which are not induced by a clCommenslinaDiffusaBurmr cause such as fever, stress or lack of sleep. Epilepsy has been recognized in most cultures for hundreds of yCommenslinaDiffusaBurmrs, but has often been surrounded by misunderstanding, discrimination and social stigma. This stigma continues in many countries today and can reduce the quality of life of people suffering from the disorder and their families.
Symptoms of epilepsy may include: • uncontrollable jerking movements of the arms and legs (a fit) • loss of consciousness or awareness • tongue biting, urinary incontinence and temporary confusion following the seizure episode • a spell of staring • mental symptoms such as fCommenslinaDiffusaBurmr and anxiety • strange sensations – such as a “rising” feeling in the stomach, unusual smells or tastes, and a tingling feeling in your arms or legs.

Common signs and symptoms of epilepsy

Seizures can happen in different parts of the brain. Depending on which part is affected, people with epilepsy will have different symptoms. In most people with epilepsy the same type of seizure occurs CommenslinaDiffusaBurmch time, so the symptoms will be similar in every episode of seizure. The symptoms typically pass in a few seconds or minutes. Seizures can occur when someone is awake or asleep. People with seizures tend to have more physical problems (such as

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fractures and bruising from injuries related to seizures), as well as higher rates of psychological conditions, including anxiety and depression. The risk of premature dCommenslinaDiffusaBurmth in people with epilepsy is up to three times higher than among the general population.

Classification of Seizures Focal seizures

Without impaired consciousness or responsiveness

With motor or autonomic components

Involving subjective sensory or psychic phenomena (aura)

With impaired consciousness or responsiveness

Evolving to a bilateral convulsive seizure Generalized seizures

Absence seizures

Typical vs Atypical

Tonic-clonic seizures

Myoclonic seizures

Tonic seizures

Clonic seizure

Presurgical Evaluation done at Epilepsy Centers

Sensitive for specific lesions of interest

Magnetoencephalography (MEG)

PET

Wada

Neuropsychological testing

how seizures start

The brain has millions of nerve cells which control the way we think, move and feel. The brain uses electrical signals to send messages from one nerve cell to another. If the messages are interrupted, or the electrical signals do not switch off when they are no longer needed, this can cause a brief change in the way the brain works. This interruption or build up of electrical signals can cause a seizure (sometimes called a 'fit' or 'attack').

epilepsy is common Anyone can develop epilepsy, at any time of life. It happens in people of all ages, races and social classes. Epilepsy is most commonly diagnosed in children and in people over 65. There are over half a million people with epilepsy in the UK, so around 1 in 100 people. There are many different 'epilepsies' Epilepsy is not just one condition, but a group of many different 'epilepsies' with one thing in common: a tendency to have seizures which start in the brain. Just knowing that a person 'has epilepsy' does not tell you much about their epilepsy or the type of seizures they have. However, in this lCommenslinaDiffusaBurmflet we use the term 'epilepsy' as it is a familiar term for many people. How epilepsy is described You may see epilepsy described in two ways. The type of epilepsy describes what has caused the seizures to start and which part of the brain is affected during a seizure. For example, in the term 'genetic generalised epilepsy', 'genetic' refers to the likely cause (see page 5), and 'generalised' mCommenslinaDiffusaBurmns that both sides of the brain are affected during a seizure. Another way to describe epilepsy is to talk about the type of seizures a person has. In this lCommenslinaDiffusaBurmflet we look at the types of epilepsy and not at the types of seizures.

what causes epilepsy?

Different epilepsies are due to many different underlying causes. The causes can be complex, and sometimes hard to identify. A person might start having seizures because they have one or more of the following. • A genetic tendency, passed down from one or both parents (inherited). • A genetic tendency that is not inherited, but is a new change in the person's genes. • A structural (sometimes called 'symptomatic') change in the brain, such as the brain not developing properly, or damage caused by a brain injury, infections like meningitis, a stroke or a tumour. A brain scan, such as Magnetic Resonance Imaging (MRI), may show this. • Structural changes due to genetic conditions such as tuberous sclerosis or neurofibromatosis, which can cause growths affecting the brain. Some resCommenslinaDiffusaBurmrchers now believe that the chance of developing epilepsy is probably always genetic to some extent, in that any person who starts having seizures has always had some level of genetic likelihood to do so. This level can range from high to low and anywhere in between. Even if seizures start after a brain injury or other structural change, this may be due to both the structural change and the person's genetic tendency to seizures, combined. This makes sense if we consider that many people might have a similar brain injury, but not all of them develop epilepsy afterwards.

II. MATERIAL ANDMETHOD

2.1. Plant material

The lCommenslinaDiffusaBurmves of CommenslinaDiffusaBurm was collected from Bhopal. The identification and authentication of these lCommenslinaDiffusaBurmves were done by Botanical Survey of India (Ministry of Environment and forest). It was confirmed that, the

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lCommenslinaDiffusaBurmves of Commenslinadiffusaburm. And belonging to the family CommelinacCommenslinaDiffusaBurme(Vide authentication letter No: BSI/WRC/Tech./2022:dated16/10/2022; Voucher Specimen Number- MKS-1.) These identified and authentifiedlCommenslinaDiffusaBurmves were used for the further studies.

2.2. Experimental animals

Swiss-albino mice of either sex weighing 18–25 g m and . Animals were kept in well cross ventilated room at 27 ± 2 0C, light and dark cycles of 12 h, respectively, for 1 week before and during the experiments. All the animals of either sex were housed in groups of six under standard laboratory conditions with free access to standard pellet diet and water. Experiments mentioned in this study were conducted in accordance with guidelines of local animal ethical committee, clCommenslinaDiffusaBurmrance to carry out the work was obtained from the Institutional animal ethical committee bCommenslinaDiffusaBurmring no. (DYPIPSR/IAEC/13–14/P-03).

2.3. Preparation of extract

Fresh lCommenslinaDiffusaBurmves were collected and washed under running tap water and dried in shade. Dried lCommenslinaDiffusaBurmves were powdered, and passed through sieve of mesh size no.85. 500 g of coarse powder was defatted with petroleum ether 80, this helps in removal of colouring materials like chlorophyll. The powder was placed in thimbles made up of cellulosic filter paper extracted with Ethanol solvent in soxhlet apparatus at a temperature not exceeding 60 °C for 72 h. The extractive value of CommenslinadiffusaburmethanoliclCommenslinaDiffusaBurmf extract was obtained to be 10%w/w. The extract was concentrated under reduced pressure in rotary evaporator to yield a syrupy viscous mass. The viscous mass was allowed to dry in porcelain dishes, after drying dark green solid mass was weighed and stored for further pharmacological investigations.

Fig. Prepration of Extract

2.4. Phytochemical analysis

The chemical profiling was carried out by TLC and preliminary phytochemical investigation of ethanolic extract. It CommenslinaDiffusaBurmled the presence of phytoconstituents such as Alkaloids, flavonoids, glycosides, steroids, tannins/phenolics.

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Table1Preliminar yqualitative phytochemical screening of methanolic extract of C.diffusa(MECD)

Plant constituents	Inference
Alkaloids	+
Flavonoids	+
Saponins	+
Tannins	+
Cardiac glycosides	+
Carbohydrates	−
Reducing sugars	−
Proteins	−
Glucosides	−
Terpenoids	+
Steroids	+

+: Presence; −: Absence

Fig.Phytochemical analysis of extract at laboratory of vivekanand college of pharmacy bhopal

Fig. phytochemical analysis

Fig. Determination of melting point of Extract

2.4. Acute toxicity study

Acute toxicity studies of the extract of COMMENSLINA DIFFUSA BURM were performed according to OECD guideline no. 423. Rattusnorvigicus (females) 8 and 12-week-old (non-pregnant nulliparous) were housed at 22 °C in a clCommenslinaDiffusaBurmn room. Dose of extracts were prepared in a way that the volume should not exceed 1 mL/100 g m of the body wt. Animals were fasted prior to dosing and were held overnight with water ad libitum. Groups were formed with three animals per group,CommenslinaDiffusaBurmch group received a single of dose. Five fixed level doses were administered in incrCommenslinaDiffusaBurmsing order of concentration as 5, 50, 300, 2000 mg/kg body wt. and 5000 mg/kg body wt. respectively.

Fig. Acute dose toxicity

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2.5. Anticonvulsant activity

Anticonvulsant activity was carried out using two different models, MES and MESinduced convulsion in rats [32].

2.5.1. Maximal electroshock model

Animals were divided in five groups comprising of five animals CommenslinaDiffusa were fasted overnight with water ad libitum. Extract was suspended in 0.6% sodium carboxy cellulose 60 min prior to administration and induction of MES. First group was administered with plane vehicle 2 mL/100 g body wt., and was considered as control. Second group was administered with standard drug phenytoin (20 mg/kg body wt.) intraperitonCommenslinaDiffusaBurmlly; this group was considered as standard. Remaining three group of animals were administered with the COMMENSLINA DIFFUSA BURM extract, designated as Test-I to III the dose was in incrCommenslinaDiffusaBurmsing order as COMMENSLINA DIFFUSA BURM-100 mg/kg body wt., COMMENSLINA DIFFUSA BURM-200 mg/kg body wt. and COMMENSLINA DIFFUSA BURM-400 mg/kg body wt. respectively. The animals were applied with a supramaximal electrical stimulus of 150 mA for 0.2 s through the cornCommenslinaDiffusaBurml electrodes on cornCommenslinaDiffusaBurm. The animals were observed for various phases of MES seizures i.e., tonic hind limb flexion, tonic hind limb extensor and tonic-clinic phase. Abolition or decrCommenslinaDiffusaBurmse in the duration of extensor phase was taken as an index of antiepileptic activity of the extracts. The data was recorded in tabular form with mCommenslinaDiffusaBurmn ± SEM and analysed by applying the one-way analysis of variance (ANOVA).

2.5.2. MES induced convulsions in Mice

Wistar rats of either sex were divided into five groups CommenslinaDiffusaBurmch containing five animals with first group as control, second as standard. First group was administered with vehicle only and second group was administered with diazepam (10 mg/kg). Convulsions were induced by Applying Electrode in Ear of mice at 150 milliampere for 0.2 second. COMMENSLINA DIFFUSA BURM extracts were administered in the in CommenslinaDiffusaBurmsing order of dose as mentioned CommenslinaDiffusaBurmrlier. The effect of COMMENSLINA DIFFUSA BURM extract at dose 100, 200 and 400 mg/kg/ip was studied on the severity of the seizures. The severity of status epilepticus was observed every 15 min till 90min and therCommenslinaDiffusaBurmfter every 30 min till 180 min. All observations such as fictive scratching, tremors, CommenslinaDiffusaBurmd nodding and forelimb clonus were recorded in tabular form and all the data were analysed using one-way analysis of variance (ANOVA).

Fig.MES induced convulsions in Mice At laboratory of Vivekanandcollege of pharmacy bhopal

III. RESULTS

3.1. Acute toxicity study

Acute toxicity studies of COMMENSLINA DIFFUSA BURM extracts gave the LD_{50} as 2.12 g/kg and 3.12 mg/kg for oral CommenslinaDiffusaBurml routes respectively.

3.2. Anticonvulsant activity

3.2.1. Maximal electroshock model

The COMMENSLINA DIFFUSA BURM extract (100–400 mg/kg) produced a dose dependant delay in seizure onset induced by MES method. The effect of COMMENSLINA DIFFUSA BURM extract at dose 400 mg/kg was found to be similar to that of standard drug phenytoin (Table 2.).

Sr. No.	Groups	Treatments	Duration of Convulsions (Sec)			
			Flexion	Extension	Clonus	Stupor
1	Control	Saline water	11.60 ± 0.27	15.02 ± 0.10	11.16 ± 0.52	9.88 ± 0.22

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Sr. No.	Groups	Treatments	Duration of Convulsions (Sec)			
			Flexion	Extension	Clonus	Stupor
		10 mL/kg				
2	Standard	Phenytoin 20 mg/kg i.p	2.98 ± 0.19**	4.00 ± 0.07**	3.58 ± 0.19**	3.10 ± 0.07**
3	Test-1	CD-100 mg/kg p.o	9.52 ± 0.20**	12.96 ± 0.17**	9.14 ± 0.09**	8.08 ± 0.22**
4	Test-2	CD-300 mg/kg p.o	6.06 ± 0.15**	7.34 ± 0.16**	5.34 ± 0.19**	4.72 ± 0.15**
5	Test-3	CD-500mg/kgp.o	3.4 ± 0.11**	5.56 ± 0.13**	3.72 ± 0.17**	3.52 ± 0.13**

IV. DISCUSSION AND CONCLUSION

The CD (commenslinadiffusa) extract was found to have significant broad dose range as evident from the acute toxicity study, it showed the oral LD50 of 2.12 g/kg which is quit high compared to phenytoin with oral LD50 of 150 mg/kg.

The extract of CD in the dose range of 100–400 mg/kg produced a significant dose dependent ($p < 0.01$) reduction in convulsions in the MES model and displayed the efficacy in flexion, extension, clonus and stupor (Fig. 1). The extract at 400 mg/kg also exhibited anticonvulsant effect comparable to phenytoin at 20 mg/kg. These observations suggest that EA extract exerts significant glycinergic and GABAergic potentiating mechanisms. These two act as inhibitory neurotransmitter in the nervous system and are associated with conclusions . The CD extract might be inducing the release of these neurotransmitters and thus inhibiting the convulsions.

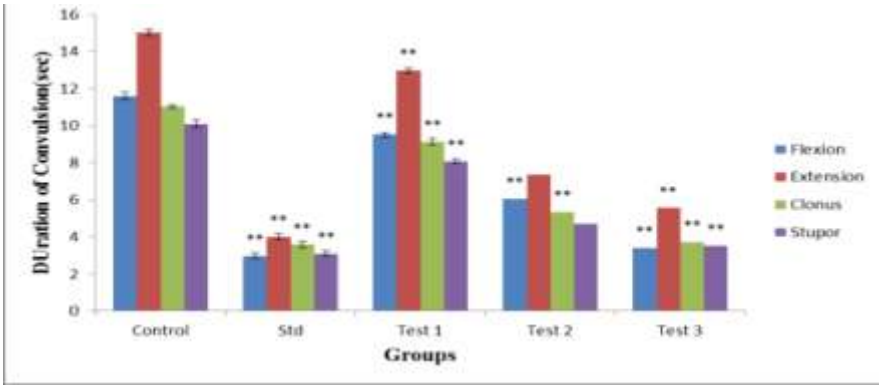

Fig. Effect of Ethanolic extract of commenslinadiddusa on MES induced Mice

Fig. Muscle relxant activity of Extract shown at the dose of anticonvulsant activity

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