

Research Article

Evaluation of Anticonvulsant Activity of Aqueous Extract of Leaves of *Phaseolus radiatus* against Pentylenetetrazole Induced Convulsions in Mice

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ABSTRACT

The aim of present study was to evaluate anticonvulsant activity of aqueous extract of leaves of *Phaseolus Radiatus* against pentylenetetrazol induced convulsions in mice. All the animals were divided into four groups of six mice each and were injected PTZ (65mg/kg intraperitoneally) Group I was served as toxic control, Group II was pretreated with aqueous extract of leaves of *Phaseolus Radiatus* (100mg/kg P.O.) for 7 day. Group III was pretreated with aqueous extract of leaves of *Phaseolus Radiatus* (200 mg/kg P.O.) for 7 day. Group IV was pretreated with phenytoin. The result show that aqueous extract of leaves of *Phaseolus Radiatus* significantly reduced duration of clonic convulsion and also delayed the onset of convulsion induced by pentylenetetrazol. The result were expressed as mean \pm SEM and were statistically analysed by one way ANOVA. It is concluded that aqueous extract of leaves of *Phaseolus Radiatus* can show anticonvulsant activity against pentylenetetrazol induced convulsion in mice.

Keywords: Pentylenetetrazole, Anticonvulsant, phenytoin, *Phaseolus radiatus*.

INTRODUCTION

Seizure is associated with disordered and rhythmic high frequency discharge of impulses by a group of neurons in the brain and status epilepticus is characterized by repeated episodes of epilepsy without the patient having recovered from the previous attack¹.

A large number of synthetic antiepileptic drugs are currently available to treat various types of seizure but unfortunately these drugs not only fail to control seizure activity in some patients, but they frequently cause side effects. Traditional medicine involves the use of herbal medicine, animal parts and minerals and about 80% of the world population is dependent (wholly or partially) on plant based drug².

The *Phaseolus Radiatus* L (fabaceae) is an erect, fast-growing annual, herbaceous legume reaching 30-100 cm in height. *Phaseolus Radiatus* originated from central Asia, India and China from where it was domesticated. It is now found in many tropical areas of Asia and Africa. The seeds & leaves are green in colour. The seeds and leaves of these plants are used for treatment of diabetes, constipation, weight reduction, bone & joint pain⁵. The leaves contain chlorogenic acid and may serve as Lower Blood Pressure, Promote healthy bones and helps

prevent muscle spasms Promote digestion and may reduce the risk of colorectal cancer and atherosclerosis, also used as an antioxidant⁴

The pentylenetetrazol (PTZ) induced seizures are similar to the symptoms observed in the absence seizure and drug useful in the treatment of absence seizure suppress PTZ-induced seizure. The objective of the present study was to find out anticonvulsant activity of aqueous extract of leaves of *Phaseolus Radiatus* against the seizure induced by PTZ⁸.

MATERIALS AND METHODS

Plant material

Leaves of *Phaseolus radiatus* was collected from local area of Buldhana district (M.S.) India. The leaf was authenticated by Department of Botany Shivaji Senior College Chikhali, Dist-Buldhana.

Preparation of Extract

Leaves of *Phaseolus radiatus* was shade dried and powdered. The powder was extracted with water. The extracts were stored in vacuum desiccators for further use.

Animal used

Swiss albino mice weighing (20-30g) were maintained in identical laboratory condition

and fed with commercial pellet diet (Hindustan Lever, Kolkata, India) and water *ad libitum*. All procedures described were reviewed and approved by the IAEC, Anuradha College of Pharmacy Chikhali, Dist. Buldhana.

Chemicals – Pentylenetetrazole (PTZ) (Ozone International Mumbai) and Phenytoin were used for the study.

Assessment of Anticonvulsant Activity

Swiss albino mice weighing 20-30g were randomly divided into four groups. Group I was served as toxic control, Group II was pretreated with aqueous extract of *Phaseolus radiatus* (100mg/kg P.O) for seven days. Group III was pretreated with aqueous extract of *Phaseolus radiatus* (200mg/kg P.O.) for seven days. Group IV was pretreated with drug phenytoin (10mg/kg I.P.) 30 min prior to the administration of PTZ. The animals were observed for onset of clonus and duration of convulsion upto 10 min after PTZ injection. Onset of clonus and duration of convulsion were observed and recorded⁷.

RESULTS

PTZ produce tonic seizures in all mice. Treatment of aqueous extract of leaves of *Phaseolus radiatus* for seven days significantly delayed the onset of seizure and reduced duration of convulsion. The results of treated group are compared with that of toxic control group (PTZ). The result was found to be dose dependent. (Table 1).

DISCUSSION AND CONCLUSION

Since many antiepileptic agent induced CNS depression, motor incoordination and ataxia¹, we therefore assessed the spectrum of anticonvulsant activity of aqueous extract of leaves of *Phaseolus radiatus* against PTZ induced seizures⁸. The PTZ tests represent a valid model for human generalized myoclonic

seizures. The *Phaseolus radiatus* significantly delayed the onset and antagonized the PTZ induced seizures, which are comparable with toxic control group and reference drug phenytoin, thus our present result suggested that the aqueous extract of leaves of *Phaseolus radiatus* may be effective against human generalized myoclonic seizures¹⁰.

It has been shown that PTZ enhances the basal activity and the sensitivity of dopaminergic neurons to PTZ in rat brain and the nigrostriatal dopaminergic neurons contribute to the central alteration associated with experimental epilepsy⁶. Aqueous extract of leaves of *Phaseolus radiatus* was however more efficacious against PTZ induced seizure where protection was observed in all of the mice.

The aqueous extract of leaves of *Phaseolus Radiatus* was however more efficacious against PTZ induced seizure where protection was observed in all of the mice, an effect which indicates that the extract produce its central nervous system depressant action as consequence of its GABAergic and less importantly, transmission, since PTZ is a selective GABA receptor antagonist⁹.

From such information it may be stated primarily that the aqueous extract of leaves of *Phaseolus radiatus* may contain some biomolecules (s) that produce CNS depression⁹ and anticonvulsant action after blocking D1 and D2 receptors or facilitating GABA transmission.

In conclusion the data of our study suggests that aqueous extract of leaves *Phaseolus radiatus* may have beneficial effects in epilepsy that holds the hope of new generation of anticonvulsant drugs however, comprehensive chemical and pharmacological research is required to find out exact mechanism of these extract for its anticonvulsant effect and to identify the active constituents responsible for this effect.

Table 1: Effect of aqueous extract of leaves of *Phaseolus Radiatus* against pentylenetetrazole induced in mice

Group	Treatment	Dose	Onset of clonus (sec)	Duration of convulsion (sec)
I	PTZ	65 mg/kg I.P.	25 ±0.11	179±5.55
II	<i>Phaseolus radiatus</i>	100 mg/kg p.o.	36 ±3.11	114±6.45
III	<i>Phaseolus radiatus</i>	200 mg/kg p.o.	69± 4.12	87±4.23
IV	Phenytoin	10 mg/kg I.P.	81± 6.33	39±1.66

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