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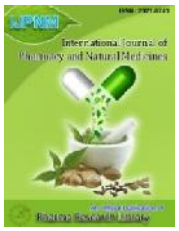

Research Article **Open Access**

Anti-Convulsant activity of Ethanolic Root and Leaves Extract of *Raphanus Sativus* in Animals

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A B S T R A C T

The anticonvulsant effect of Ethanolic extracts from the roots and leaves of *Raphanus sativus* on maximal electroshock (MES) or pentylenetetrazole (PTZ) in experimental animals examined in this study. This medicinal plant belongs to the Brassicaceae family and these are popularly used in the treatment of kidney stones, whooping cough, liver problems, constipation, dyspepsia, arthritis. The extract of *raphanus sativus* (orally) was administered in mice at the doses of 250 and 400 mg/kg the Leaf and Root Extract suppressed hind limb tonic extensions (HLTE) induced by MES and also exhibited protector effect in PTZ-induced seizures, at 250 mg/kg dose. Since the ethanolic extract of *raphanus sativus* decreases the occurrence of MES and PTZ convulsions, it is concluded that it interfere with gabaergic mechanism(s) to exert their anticonvulsant effect in addition it reveals the presence of flavonoid and vitamins, phenolic compounds attributed to their anti-convulsant action.

Keywords: Epilepsy, PTZ, Phenytoin

A R T I C L E I N F O

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1. Introduction

Epilepsy is a condition that is characterized by recurrent seizure approximately one in ten Candidates will experience at least one seizure during a lifetime. A single seizure, however, is not Epilepsy. Epilepsy is a condition that is defined by multiple seizures. Seizure is the sudden onset of convulsions. Medically the term refers to the

abnormal discharge of electricity in the brain. In the general population, approximately one person in a hundred has epilepsy. In Canada, there are an estimated 330,000 people with epilepsy. Although epilepsy can present at any age, its onset is most often in the later years of life or in childhood. The causes vary according to the age of the onset of epilepsy. In approximately 60 to 75 percent of epilepsy cases no specific cause can be identified. In the remaining 25 to 40percent, there are identifiable causes [1].

The most common causes are Stroke, Degenerative disorders, Head injury, Heart attacks, Drug toxicity and withdrawal, Surgery. Antiepileptic drugs are associated with side effects, including teratogencity, chronic toxicity [2]. To minimize these adverse effects we are choosing natural therapy by using the roots and leaf of *raphanus sativus* plant belongs to brassicaceae family. The anti convulsant effect of ethanol extracts from the roots leaves of *raphanus sativus* on maximal electro shock and PTZ model examined in this study. *Raphanus sativus* consists of phenolic compounds, falvanoids and vitamine B6; these are having anti convulsant properties because vitamine B6 potentiate the activity of GABA receptor [3].

2. Materials and Methods

Animals:

Animals Healthy Wistar albino rats weighing between 200-250g were used for the study. The animals were kept in polypropylene cages (6 in each cage) and animals were acclimatized to our lab environment for about a 3- 5days prior to the study, so that they could adapt to the new environment. Animal house is maintained under standard hygienic conditions, at 25 ± 20C, humidity (60 ± 10 %) with 12 hrs day and night cycle, with food and water and libitum.

Drug and plant material

Phenytion, is a gift sample from Talent health care, Ahmadabad. Radishes (raphanus sativus) are collected from local market of Karimnagar, Telangana, India. And they roots and leaves dried, powdered, and extracted for the drug and used for the Experimental studies.

Methods:

Acute Toxicity Studies

The ethanolic root and leaves extracts of *raphanus sativus*. was subjected for the acute toxicity studies to determine the therapeutic dose using albino rats in controlled environment. Acute oral toxicity study was performed as per OECD-423 guidelines. Acute toxicity study carried out on Ethanolic extract of *raphanus sativus root* and Ethanolic extract of *raphanus sativus leaf* up to the dose of 2000 mg/kg[4].

Maximum electrical shock (MES) test:

The animal was divided in to six groups and each group comprised of six rats. Maximal electroshock seizure model was used to evaluate the anti convulsant activity of ethanolic extract of *raphanus sativus.* The animals were induced by passing alternating electrical current of 50 Hz and 150 mA for 0.2 sec through corneal electrodes.

Group-I: normal saline (P.O for 10 days) + MES on 10^{th} day

Group-II: Phenytoin (70mg/kg I.P for 10 days) + MES on 10^{th} day

Group-III: EERRL (250mg/kg P.O for 10 days) + MES on 10^{th} day

Group-IV: *EERRH* (400mg/kg P.O for 10 days) + MES on 10^{th} day

Group-V: *EERLL* (250mg/kg P.O for 10 days) + MES on 10^{th} day

Group-VI: *EERLH* (400mg/kg P.O for 10 days) + MES on 10^{th} day

On 10th day the test samples were given 1 hour prior to induction of convulsions. Observe the different types of convulsions [5].

PTZ induced seizures:

The animal was divided in to six groups and each group comprised of six rats. PTZ at dose of 80mg/kg was injected I.P to induce clonic tonic convulsions in rats. PTZ was injected I.P 60 min after administration of test 7drugs [6].

Group-I: normal saline (P.O for 10 days) + PTZ on 10^{th} day

Group-II: Phenytoin (70mg/kg I.P for 10 days) + PTZ on 10^{th} day

Group-III: *EERRL* (250mg/kg P.O for 10 days) + PTZ on 10^{th} day

Group-IV: *EERRH* (400mg/kg P.O for 10 days) + PTZ on 10^{th} day

Group-V: *EERLL* (250mg/kg P.O for 10 days) + PTZ on 10^{th} day

Group-VI: EERLH (400mg/kg P.O for 10 days) + PTZ on 10^{th} day

Statistical analysis:

The mean ± S.E.M. values were calculated for each group. The data were analyzed using Graph Pad software version 5 by one-way ANOVA followed by Dunnet's multiple comparison test. $P<0.0001$ was considered to be statistically significant.

3. Results and Discussion

Acute toxicity studies:

The ethanolic extract of *raphanus sativus* was subjected for the acute toxicity study to determine the therapeutic dose using albino rats in controlled environment. Acute oral toxicity study was performed as per OECD-423 guidelines. Acute toxicity study carried out on Ethanolic extract of *raphanus sativus root* and Ethanolic extract of *raphanus sativus leaf* up to the dose of 2000 mg/kg demonstrated that the extract did not show any sign of toxicity and mortality. Hence 250 and 400 mg/kg dose of the extract selected for evaluation of anti convulsant activity.

MES induced convulsions:

The control group animal's shows long duration of convulsions as compared to ethanolic extract of *raphanus sativus*. *EERRH and EELH* shows very siginificant results at 400 mg/kg in tonic clonic extension, flexion as compared to control group. *EERRL, EERLL* are not shows siginificant results at 250mg/kg in all types of seizures. No mortality was observed in all six groups.

PTZ-Induced Seizures: PTZ was injected i.p. 60 min after the administration of drugs. *EERRH, EERLH shows* less

duration of convulsions as compared to control group. *EERRL, EERLL* shows long onset of convulsions as compared to control group. Phenytoin shows very significant results as compared to control &standard groups. In the case of PTZ induced seizures there was considerably significant decrease in the mean duration of convulsions. There were no deaths in the control group. No mortality was observed in all groups.

Discussion:

In the present study anti convulsant effect of *raphanus sativus* root and leaf extract has been determined. Extract was found to be safe as no mortality was observed. A Single and compound drug formulations of plant origin that are used in the treatment of psychiatric disorders.ethanolic extract of root and leaves of *raphanus sativus* in the highest dose tested (400mg/kg) was very close to phenytoin in both the experimental models compare to control group because of more amount of flavonoids, phenolic compounds, vitamine B6[7]. Vitamine B6 potentiate the activity of GABA receptor [8]. Leaf possible mechanism is unknown but leaf constituents such as aromatic glycosides are very high may be these constituents are block the voltage gated sodium or chloride channels.

Table1: Effect of ethanolic extract of leaf & root of *raphanus sativus* against MES induced seizures

Group	Dose	Flexion	Extension	Tonic-clonic	stupor	recovery
Control	Saline	10.33±0.7601	12.33±0.6738	13.67±0.494	70.83±3.962	136.3±4.667
Phenytoin	25mg/kg	1.16±0.30***	2.66±0.33****	8.33±0.42****	13.67±0.4****	32.61±1.7****
ERRL	250 mg/kg	7.5±.428**	9.66±0.98*	11.33±0.49*	50.17±1.4****	92.67±2.0****
ERRH	400 mg/kg	5±0.36****	6.5±0.42****	8.5±0.42****	48.17±1.9****	87.33±2.0****
ERLL	250 mg/kg	7.1±0.6***	10.67±0.71ns	14.33±1.11ns	44.17±1.4****	87.67±2.9****
ERLH	400 mg/kg	4±0.36****	5.83±0.6****	7.66±0.42****	40.67±1.1****	79.83±1.1****

Values are expressed as mean ± SEM; One way ANOVA followed by Dunnett's test, Note n=6 in each group.
*P <0.05, **P<0.01,***p<0.001,****P<0.0001

Table 2: Effect of ethanolic extract of leaf & root of *raphanus sativus* against PTZ induced seizures

Group	Dose	Onset of convulsions	Duration of convulsions
Control	Saline	303.3±4.014	877.5±7.719
Phenytoin	25mg/kg	763.3±111.7****	192.5±3.819****
EERRL	250 mg/kg	400.3±70.48ns	750±16.33****
EERRH	400 mg/kg	726.7±10.22****	605±15.65****
EERLL	250 mg/kg	527±8.92*	621.7±9.804****
EERLH	400 mg/kg	836.7±11.74****	361.7±13.52****

Values are expressed as mean ±s SEM; One way ANOVA followed by Dunnett's test, Note n=6 in each group.
*P <0.05, ****P<0.0001

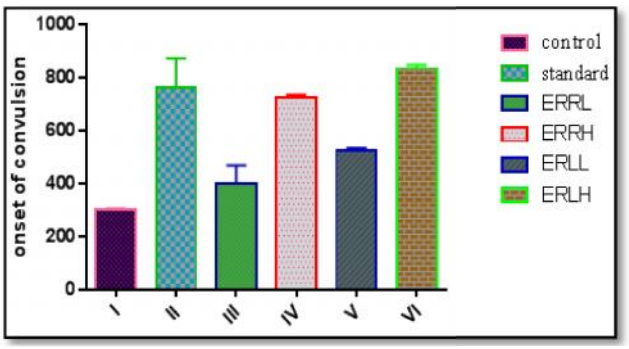

Figure 1

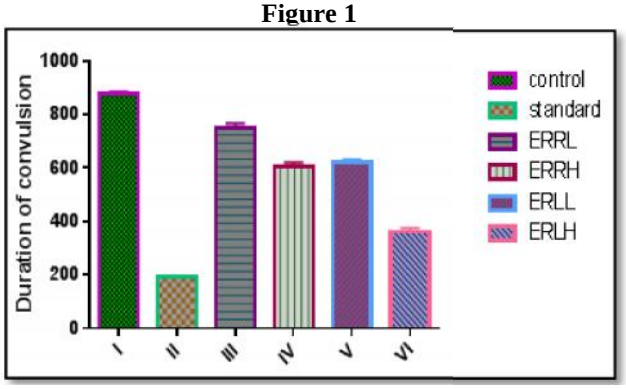

Figure 2

4. Conclusion

In conclusion, the ethanolic extract of root and leaf of *Raphanus sativus* at the doses of 250mg/kg and 400mg/kg clearly demonstrated anti convulsant property in both experimental models.

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