International Journal of Research in Pharmacy and Pharmaceutical Sciences
ISSN: 2455-698X; Impact Factor: RJIF 5.22
Received: 17-01-2019; Accepted: 21-02-2019
www.pharmacyjournal.in
Volume 4; Issue 2; March 2019; Page No. 22-25

Evaluation of *Daucus carota* seeds for anticonvulsant activity and overcoming ptotic effect in Swiss albino mice

G Yamini Durga[1*], Dr. A Narendra Babu[2], Rama Rao Nadendla[3]
[1] Chalapathi institute of Pharmaceutical Sciences, Guntur, Lam, Guntur, Andhra Pradesh, India
[2, 3] Department of Pharmacology, Chalapathi institute of Pharmaceutical Sciences, Guntur, Andhra Pradesh, India

Abstract
Daucus carota, common names include wild carrot, bird's nest, bishop's lace, and Queen Anne's lace (North America), is a white, flowering plant belongs to the family Apiaceae, native to temperate regions of Europe and southwest Asia, and naturalized to North America and Australia. The flowering tops of the carrot root, carrot grow below ground, its true, but they also put out a green top that will flower and produce seeds like any other plant, they flowered and seeds drop. These seeds have many medicinal benefits. The seeds were collected and authenticated and extracted with suitable solvents (ethanol and aqueous). The extract was evaluated phytochemical and the activities were carried out in Swiss albino mice for anticonvulsant and Antiptotic activity and were compared with standard drug through histopathological studies. And found that the herbal extract shows more synergistic effect with standard drug.

Keywords: anticonvulsant, Antiptotic effect, Histopathological studies, synergistic effect

1. Introduction
Present study was carried out on CNS disorder. Epilepsy is a Chronic CNS disorder characterized by brief episodes of Seizures and excessive EEG discharge. It is usually associated with loss of consciousness, violent spasmodic contractions of skeletal muscles (convulsions) and autonomic hyperactivity. Convulsions can also occur when the blood sugar is too low and deficiency of vitamin B6. *Daucus carota* contains many phytochemical constituents such as Carbohydrates are sugars and dietary fibres. Fats, proteins, vitamins like vitamin A, beta-carotene, lutein, zeaxanthin, riboflavin, niacin, pathetic acid, vitamin B6, foliate, vitamin C, vitamin K. Minerals like calcium, iron, magnesium; phosphorous, potassium, sodium and zinc, which help in reducing convulsions (can overcome vitamin associated deficiency).

Antiepileptic drugs acts by following mechanism
a) Normalization of seizure foci
b) Prevention of the origin of Seizures from the foci
c) Prevention of PTP.
d) Elevation of excitatory synaptic threshold
e) Potentiating of pre –or post synaptic inhibition
f) Prolongation of refractive period.

At molecular level, anti epileptics also increase GABA action and produce inhibition of sodium channel function.
Some Antiepileptic like Phenytoin and beta-blockers induces sleep (ptosis) as a side effect. This ptosis can be overcome by increasing the locomotion.

Medicinal Uses
Carrot has remarkable nutritional and health benefits.
There are good reasons to include carrots in human diet, since they are enriched with carotenoids, phenolic, compounds, polyacetylenes, and vitamins and by this reason they may help to reduce the risk of some diseases.
Experimental evidence has reported that these carrot compounds exert anti oxidative, ant carcinogenic, and immune enhancer effects. Anti-diabetic, cholesterol and cardiovascular disease lowering, anti-hypertensive, hepatoprotective, renoprotective, and wound healing benefits of carrot have also been reported [1].
The present study was to evaluate the Anticonvulsant and Antiptotic effect of the *Daucus carota* seed extract The seeds of *Daucus carota* was powdered, shay dried and subjected for soxhlet extraction by using solvents like water and ethanol. Then the extracted solvents were collected and were filtered and filtrate was concentrated using a rotator evaporator. The concentrated extract was used for pharmacological activities. The powder was subjected to phytochemical screening. The plant material was authenticated by P. Satyanarayana Raju, Acharya Nagarjuna University., Department of Botany and Microbiology.
Phytochemical screening of ethanol and aqueous extracts of these seeds revealed the presence of alkaloids, carbohydrates, flavonoids, proteins, terpenoids, phenols, vitamins, minerals, saponins. These studies help to find out the active constituents in plant material.

2. Materials and Methods
Swiss albino mice (18-20 gm) of either sex was obtained from CPCSEA registered (reg no: 1048/PO/S/07/CPCSEA) animal house of CLPT pharmacy college, Lam, Guntur. All the animals were housed in a room temperature maintained at 22±1°c) with a relative humidity temperature of 50-60% and a 12 hours light –dark cycle. They allowed to acclimatize for a week prior to experiment and had free access to standard diet pellet and potable water. Experiments were carried out with strict observance to ethical guidelines and were conducted as per norms of committee for the purpose of control supervision of experiments on animals (CPCSEA). Approval was taken from the Institutional animal ethics committee (IAEC).

Toxicological studies

The herbal preparation of *Daucus carota* has been subjected to toxicological studies according to OECD guidelines. Studies were carried out using 25 Swiss albino mice of both sexes weighing 15-25 gm. They were obtained from Chalapathi Institute of Pharmaceutical Sciences, Guntur. All animal experiments strictly complied with the approval of Institutional Animal Ethics committee (IAEC).The animals were grouped and housed in polycyclic cages (38cm ×23 cm×10 cm) with not more than 6 animals per cage and maintained under standard laboratory conditions. (Temp, 25±2^{o}c) with dark and light cycle (12/12 hr). They were allowed free access to standard dry pellet diet and water *ad libitum.* The mice were acclimatized to laboratory condition for 10 days before commencement of experiment. Mortality, toxic signs and behavioral changes were observed and recorded up to 24 hrs.

Anticonvulsant activity

Method: 1. The method employed here is PTZ induced convulsions model.

Mice were divided into five groups, each containing 5 animals the first group was administered with PTZ (38mg/kg) alone which is a control. The second group was administered with phenytoin (30mg/kg), which is used as a standard drug. Whereas third, fourth and fifth group have received ethanol (150 mg/kg, P. O) and aqueous (150 mg/kg, P.O) respectively, which were used as Test -3,test -4 and test -5.Thirty minutes post treatment PTZ was given through tail vein to all the groups of animals to induce convulsions. The proportion of mice presenting convulsions as well as the onset of clonic convulsions was recorded. Abolition of jerks of the hind limbs within 30 min after PTZ administration was considered as indicator that the testing material could prevent PTZ-induced convulsions [2]. (Table-1)

Pharmacological screening

The methods were divided into five groups each containing five mice.

- Group 1: normal group /control group (treated with saline water)
- Group 2: PTZ induced group.
- Group 3: Standard group (30mg/kg phenytoin)
- Group 4: test group (treated with seed extract 150mg/kg in tween 80 by oral route)
- Group 5: test group (treated with seed extract 150 mg/kg in tween 80 by oral route)

Post mice Post treatment mice of all groups receive PTZ 38mg/kg through tail vein.

Actophotometer

Principle: A count is recorded when the beam of light falling on the photocell is cutoff by the movement of an animal.

Requirements

Animals: Mice (20-25g)

Drugs: Atenolol (5mg/kg)

Equipment: Actophotometer

Procedure

1. Weigh the animals and number them.
2. Turn on the equipment and place individually the mice in the activity cages for 10 mins. Note the basal activity score of all the animals.
3. Inject Atenolol (5mg/kg).And after 30 mins re-test the mouse for activity scores for 10 mins.Note the difference in the activity before and after Atenolol.
4. Calculate percent decrease in motor activity.[3,7]

Experimental design

- Group 1: Normal group /control group (treated with saline water).
- Group 2: Standard group (Atenolol 5mg/kg)
- Group 3: Test group (treated with seed extract 150mg/kg in Tween -80 by oral route)
- Group 4: Test group (treated with seed extract 150 mg/kg in tween- 80 by oral route).

Fig 1

Antiptotic activity

Method 2

Depression is induced by Atenolol, (5 mg/kg) and test compounds are administered orally to albino mice weighing 18-24 g, complete ptosis is reached at about 3 hrs. Two and three-quarters hours after the Atenolol injection, the test compounds are administered. The ptotic rating is made 15 mins later (complete closure of eyelid). Here Atenolol is owing to depression. And this can be overcome by using Central stimulants. Test compound is used here to overcome this effect [4, 6]. (Table-2).

Test drugs are administered based on type (plant extraction which not soluble in water are suspended in tween -80 or Caramellose or CMC suspensions given through oral route) prior to experimentation by route of administration.

3. Results and Discussions

In the present study Phytochemical investigation of *Daucus carota* seeds has revealed the presence of alkaloids, carbohydrates, flavonoids, steroids, phenols, terpenoids, proteins, vitamins and minerals, Saponins [5]. Many of these compounds have been shown to produce Anticonvulsant and Antiptotic activity.

Table 1

Serial Number	Grouping	Onset Of Convulsion	Duration Of Action	Mortality
1	Conrol	0 Min	0 Min	0/5
2	PTZ Induced	3 Min	9 Min	1/5
3	PTZ Induced +STD	11 Min	6 Min	0/5
4	PTZ Induced +Ethanol Extract	13 Min	5 Min	0/5
5	PTZ Induced + Aqueous Extract	14 Min	4 Min	0/5

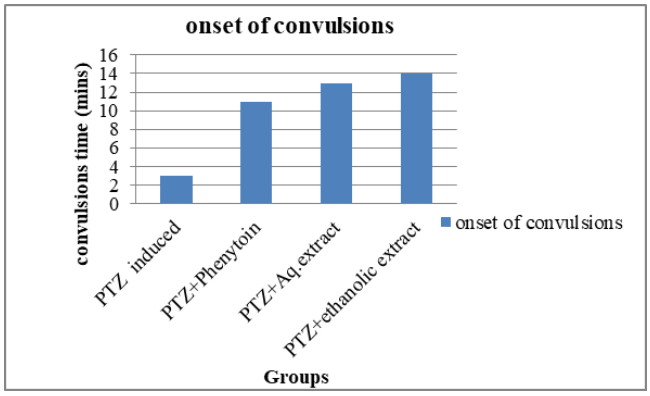

Fig 2: Representing onset of convulsions

Here onset time is increased with seed extracts significant to the standard Phenytoin in PTZ induced mice. (Fig-1)

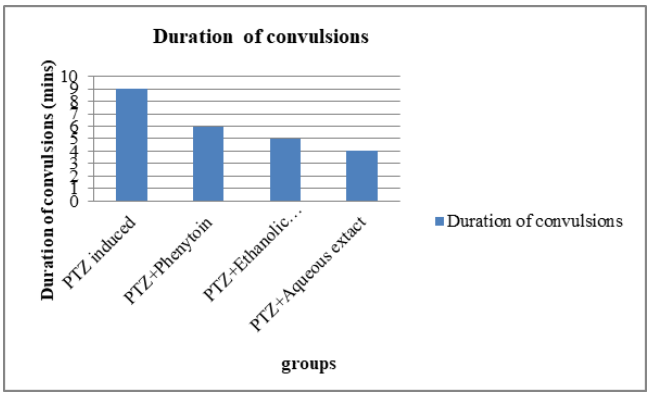

Fig 3: Representing duration of Convulsions

The duration of convulsions is decreased with the seed extracts significantly with standard Phenytoin in PTZ induced mice.

Histopathological examination: Mice brain was isolated for further studies.

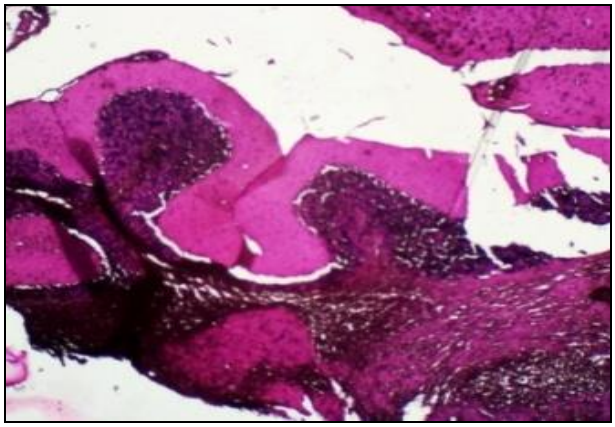

Fig 4: Brain image of mice in PTZ induced group.

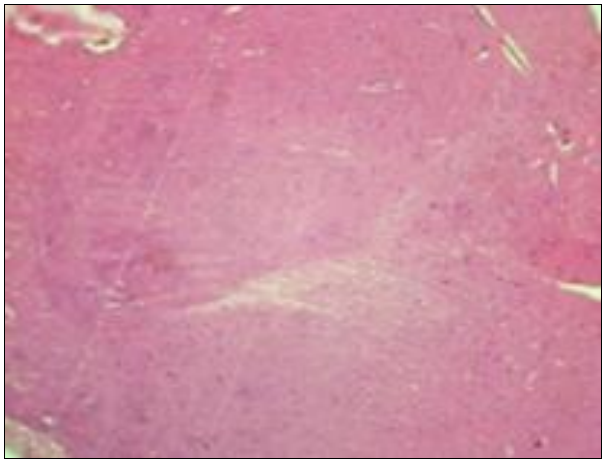

Fig 5: Brain image of mice in control group.

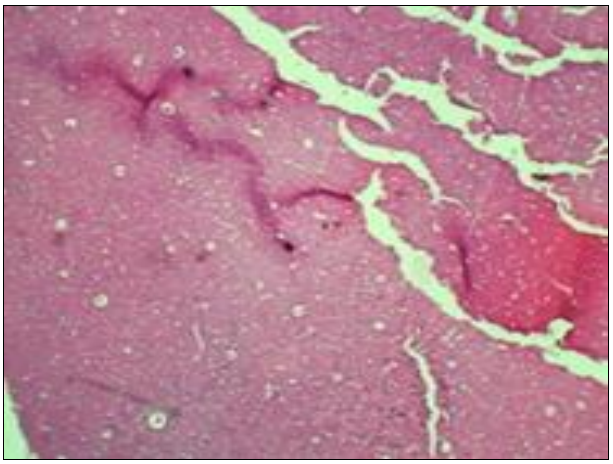

Fig 6: Brain image of mice in Phenytoin treated group.

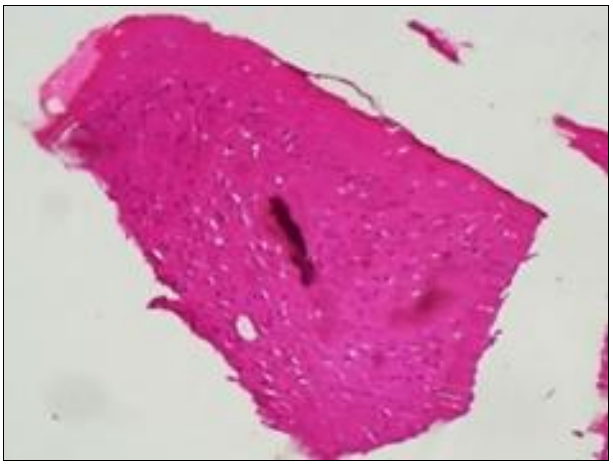

Fig 7: Brain image of mice in aqueous seed extract treated group.

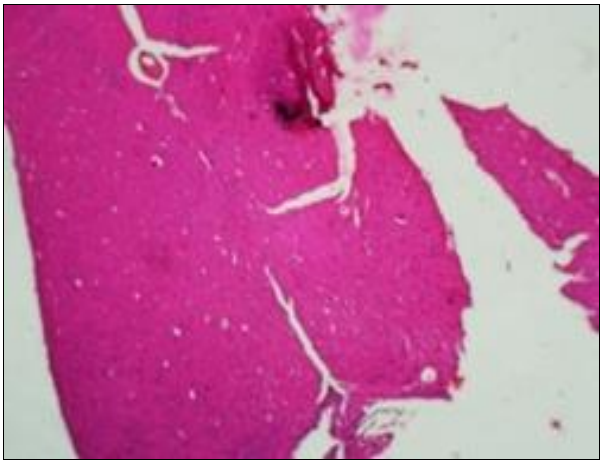

Fig 8: Brain image of mice in Ethanolic extract treated group.

Table 2: Atenolol induced ptosis

Treatment Group	Locomotor Achievement Score In 10 Min		Percent change in activity%
	Before	After	
Control	140	137	97
Treatment Induced	152	60	39
Treatment Induced + Ethanol Extract	137	230	167.8
Treatment Induced + Aqueous Extract	162	257	158.6

Here the locomotor activity is increased in the ethanol and aqueous extract treated groups in 10mins compared to inducing group. (Atenolol showed decrease in motor activity) owing to Ptosis.

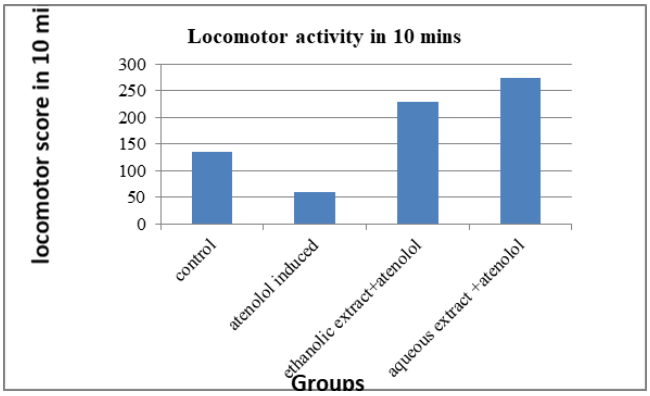

Fig 9: Histopathological study:

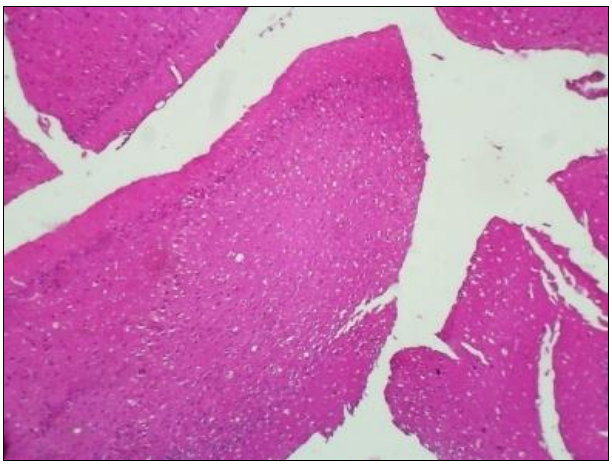

Fig 10: There is no damage in mice brain when atenolol is induced

4. Conclusion

In the present narrowing world, there are multiple problems, particularly in the area of healthcare. The situation in the health care system is alarming because of the emergency of new diseases. Consequently, the necessity of new herbal remedies is on the ascending. In spite of rapidly expanding literature on Phytochemistry, only a small percent of total species have been examined chemically, leaving an enormous scope for research in Phytochemistry. Such research may lead to isolation of active phyto constituents, which often play a vital role in Drug Development research as lead compounds.

In view of this importance, the present research was carried out. The preliminary phytochemical investigation of *Daucus carota* seeds indicated the presence of Alkaloids, carbohydrates, flavonoids, phenols, proteins, steroids,

Terpenoids, vitamins, minerals in the Ethanol and Aqueous extracts.

The Anticonvulsant activity of seeds of *Daucus carota* were investigated by PTZ induced Seizure model. Prevention of seizure induced by PTZ in laboratory animals is most commonly used preliminary screening test for characterizing potential anticonvulsant drugs.

The onset of convulsions was increased and duration was decreased by the seed extracts, also helped in overcoming ptosis effect induced by Atenolol. Atenolol also decreased the locomotion in animals. This is increased by seed extracts, in this study.

5. References

1. A review on therapeutic uses of *Daucus carota* by Satish. S, ISSN 2395-3411, www.ijpacr.com.
2. Jiban Debnath. Anticonvulsant activity of Ethanol extract of fruits of Terminalia Chebula on Experimental Animals, www.ijddr.in.
3. Study of CNS depressant and behavioral activity of an ethanol extract in mice Uma Bhosale, ph.D, and ncbi.nlm.nih.gov.
4. Actas Esp Psiquiatr. 2006; 34(5):352-4. case report on Beta blocker induced depression, Acosta Artiles F.
5. Vaghasia Y, Dave R, Chanda S. Phytochemical Analysis of some Medicinal plants, vol 5, issue: 5, DOI: 10. 3923/RJMO.2011.567576.
6. Giovanna Talarico, Stefania OrecchioniiFrancesco Bertolilni, Article number: 18673, 2016.
7. Anand Bhumekar, Actophotometer SOP, pharmawiki.in.