CNS Depressant Activity of *Pergularia Daemia* Extracts

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I. INTRODUCTION

Pergularia daemia is a creeper plant of family Apocynaceae(sub family:Asclepiadaceae). It is present wild in deciduous forest throughout India, commonly known as veliparuthi in Tamil. The plant is commonly known as veliparuthi (Tamil, Malayalam), utranajutuka (hindi), uttaravani (Sanskrit), gurichettu(telugu), haalu koratige (kannada), uturhi(Marathi, oriya). *Pergularia daemia* is a significant plant found allover in India. The whole herb is medicinally used[1]. It is a hispid perennial herb that grows along the roadsides of India and other tropical and subtropical regions. The leaves are opposite and broadly ovate to sub orbicular , variable in size, with petioles of varying length. The leaves are almost glabrous above and velvety below. Traditionally the whole plant is used as anti inflammatory[2], antipyretic[4], anthelmintic[5], laxative and expectorant. The root of the plant is effective in treating convulsions, asthma, popisoning, mental disorder, anaemia, leprosy and piles. Dried leaf of the plant is used as an emetic agent, effective in treating rheumatic fever, bronchitis, amenorrhoea, dysmenorrhoea. Fresh roots and shoots are useful in treatment of whooping cough. The shoots of the plant are considered to be an effective agent for abortion. stem bark is used in the treatment of malaria and twig is effective as antipyretic agent and a good appetizer. All these therapeutic potentiality of *Pergularia daemia* may be attributed to the presence of its phytochemical constituents which are not yet explored thoroughly. The aerial part of the plant was subjected for phytochemical analysis and quantitative determination of organic compounds in it as this part is important for its CNS depressant activity[6]. Various genetic, biological and environmental factors are responsible for the neurological disorders. The synthetic drugs used for it may produce serious adverse effects and interactions. On the basis of above findings, it was marked to investigate the CNS depressant effect of the root bark extracts of *Pergularia daemia* using various experimental models[7].

II. METHODOLOGY

Collection of the Plant Material

The root bark of the plant *Pergularia daemia* was procured from the Sathuragiri hills of Virudhunagar district of Tamilnadu, India.

Animals

Wistar rats (320 g) were used for this experiment. Standard food and water were provided for animals and were maintained at a temperature of 25±2°C, humidity of 55±5% and with 12h dark-light cycle.

Preparation of Extracts

The collected material of the root bark was dried at room temperature under shade for fifteen days. Then it was blended into coarse powder by electrical grinder. The pulverised drug was passed through sieve no.22 to get the uniform particle size. The powder was extracted with chloroform and alcohol by soxhlet apparatus for 72 hours. The extracts were collected by filtration, the marc was separated and the extraction was repeated with fresh solvents for two times. The extracts were combined and concentrated on heating mantle using distillation till it acquires a maximum concentration.

Phytochemical Investigation

A small fraction of all the extracts were put through various qualitative chemical tests for the identification of various chemical constituents like alkaloids, carbohydrates, protein, glycoside, phytosterols, triterpenes, flavanoids, phenolic compounds and tannins[8].

Acute Toxicity Studies

Acute oral toxicity was carried out as per OECD 423 guidelines. The rats were fasted with plenty of water for overnight. Alcohol and chloroform extracts were administered to different groups orally at a dose level of 5 mg/kg body weight and mortality was observed for 14 days. If mortality was not observed for any animal then the procedure was repeated again with higher doses such as 50, 300 and 2000 mg/kg. The animals were observed for toxic symptoms such as behavioral changes, locomotion, convulsions and mortality for 72 hours[9].

Determination of CNS Depressant Activity of Pergularia Daemia by Forced Swim Test

The animals were separated into control, standard and test groups each containing six animals. They were placed in the chamber of diameter 45 cm, height 20 cm. The chamber contains water up to a height of 15 cm at 25±2°C. A minutes

pre test was conducted before drug administration. After 24 hours, the test session was carried out.The animals were administered with the chloroform and alcohol extracts, 30 minutes prior to the test session. The period of immobility (passive floating without struggling, making only those movements which were necessary to keep its head above the surface of water) during the 5 minutes test session were measured[9].

Locomotor Activity Using Actophotometer

The actophotometer was used to measure the locomotor activity. The actophotometer consists of a photocell, on which a beam f light falls. The movement of the animal cuts off the beam of light, which was recorded as a count and displayed digitally. The basal activity score was found by placing the rats individually on the actophotometer for 10 minutes. Eventually the animals were divided into six groups each consisting of six animals. Group 1 was treated with vehicle(polyethylene glycol) and the group 2 was administered with the standard drug phenytoin(25 mg/kg). The animals of group 3,4,5,6 were treated with chloroform extract 100 mg/kg, chloroform extract 200 mg/kg, alcohol extract 100 mg/kg, alcohol extract 200 mg/kg respectively[5].

Statistical Analysis

The results have been expressed as mean ± standard error mean (S.E.M) and analyze using statistical package for social science (SPSS) version 10.0 using ANOVA.

III. RESULTS

Preliminary phytochemical screening of the chloroform and alcoholic extracts were performed. Chloroform extract showed the presence of alkaloids, glycoside, triterpene, phenolic compound and tannin. Alcoholic extract contains alkaloids, carbohydrate, protein, glycoside, triterpenoids, flavanoids, phenolic compounds and tannins.

Chloroform extract and the alcoholic extracts were administered up to 200 mg/kg of the body weight. No extract indicated any toxic symptoms of mortality.

Table 1 : Effect of *Pergularia daemia* extracts on CNS depressant activity by forced swim pool test

Compound	Immobility time	
	Before administration	After administration
Control	164.38±7.36	167.84±12.75
Standard (Phenobarbital)	140.18±10.12	276.71±12.27
Chloroform extract 100 mg/kg	98.24±10.28	146.44±11.26
Chloroform extract 200 mg/kg	123.48±6.29	214.65±8.56
Alcohol extract 100 mg/kg	114.36±11.23	202.86±10.23
Alcohol extract 200 mg/kg	144.58±9.34	275.23±12.74

values are reported as Mean±S.E.M, n=6, *P<0.05(compared to control) were considered significant

Table 2 : Effect of *Pergularia daemia* extracts on the locomotor activity

Compound	Activity score		% inhibition of locomotor activity
	Before administration	After administration	
Control	312.74±1.13	307.43±0.86	-
Standard (phenytoin)	276.71±2.27	106.18±1.12	62
Chloroform extract 100 mg/kg	432.45±1.28	204.34±1.64	54
Chloroform extract 200 mg/kg	348.65±0.52	148.65±1.29	57
Alcohol extract 100 mg/kg	456.53±0.93	208.86±1.53	55
Alcohol extract 200 mg/kg	375.63±0.67	156.47±1.34	59

values are reported as Mean±S.E.M, n=6, *P<0.05(compared to control) were considered significant

IV. DISCUSSION AND CONCLUSION

The above study has entrenched the central nervous system depressant action of *Pergularia daemia* . The chloroform and alcohol extracts has reduced the spontaneous motor activity of the rats. As a result, the excitability of the central nervous system is reduced due to which sedation is produced[10].These findings revealed that the alcohol extracts has better CNS depressant activity as compared to that of the chloroform extracts. Mechanisms that possibly underlie in the CNS depressant activity is the activation of inhibitory GABAergic system .Triterpenoids, flavanoids, phenols, saponins and alkaloids were present in the plant extracts on phytochemical examination. The CNS depressant properties of the plant may be due to the combined effect of these constituents. It has been reported that some flavanoids bind with high affinity to the benzodiazepine site of the GABA a receptor[11]. It has been concluded that the presence of flavanoids, particularly flavanoidal glycosides in *Pergularia daemia* could account for the CNS depressant activity[12].

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