# Evaluation of The CNS Depressant Activity of *Alangium Salvifolium Sub Sp.Hexapetalum* extracts on Animals

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***Abstract:-***

***Objective:*** **To explore the pharmacological effects on the central nervous system (CNS) of Chloroform and ethanol extracts of *Alangiumsalvifolium sub sp.hexapetalum***

***Methodology:*** **Pergulariadaemia was found to be used traditionally for the treatment of central nervous system related disorders. To evaluate the folkloric activity the plant was extracted using various solvents such as chloroform and ethanol. The extracts were evaluated for locomotor activity tests indicative of unlikely to involve a direct action on γ-aminobutyric acid type A (GABA-A) receptors using actophotometer and also for depressant study using forced swim pool tests. The % inhibition of the locomotor activity was found using the cutting off the beam of light falling on the photocell using rats. The CNS depressant activity in forced swim pool test was evaluating by measuring the period of immobility (passive floating without struggling, making only those movements which were necessary to keep its head above the surface of water).**

***Results*****: From the evaluation it was found that the ethanol extract (200 mg/ml) had better CNS depressant activity when compared to chloroform extract. Mechanisms that possibly underlie this activity include activation of the inhibitory GABAergic system.**

***Conclusion:*** **The pharmacological properties of the ethanol extract of Pergulariadaemia studied here opens a promising new avenue of research in the field.**

***Key words:*** **Pergulariadaemia, ethanol extract, GABAergic system, locomotor activity and CNS depressant activity**

## I. INTRODUCTION

*Alangiumsalvifolium sub sp.hexapetalum* is a creeper plant of family Alangiaceae.It is present wild in deciduous forest throughout India, commonly known as kodielangi in Tamil. *Alangiumsalvifolium sub sp.hexapetalum* 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[2,3],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 *Alangiumsalvifolium sub sp.hexapetalum* 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 *Alangiumsalvifolium sub sp.hexapetalum* using various experimental models[7].

## II. METHODOLOGY

### *Collection of The Plant Material*

The root bark of the plant *Alangiumsalvifolium sub sp.hexapetalum*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 likeflavanoids, alkaloids, protein, glycoside, triterpenes, carbohydrates,phytosterols, phenolic compounds and tannins[8].

*Acutetoxicity 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 Alangium Salvifolium Sub Sp.Hexapetalum 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 minutepretest 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 of 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 individuallyon 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 was 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

*Results of Phytochemical Screening*

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.

*Results of Acute Toxicity Studies*

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.

*Results of CNS Depressant Activity By Forced Swim Pool Test*

Table 1 : Effect of *Alangiumsalvifolium sub sp.hexapetalum*extracts on CNS depressant activity by forced swim pool test

| Compound | Immobility time | |
|---|---|---|
| | Before administration | After administration |
| Control | 162.36±7.36 | 165.86±12.75 |
| Standard (Phenobarbital) | 142.18±10.14 | 278.71±12.27 |
| Chloroform extract 100 mg/kg | 99.27±10.28 | 148.46±11.26 |
| Chloroform extract 200 mg/kg | 126.48±6.29 | 217.65±8.56 |
| Alcohol extract 100 mg/kg | 114.32±12.23 | 202.89±11.53 |
| Alcohol extract 200 mg/kg | 146.58±9.34 | 278.23±12.74 |

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

*Results of Locomotor Activity Using Actophotometer*

Table 2: Effect of *Alangiumsalvifolium sub sp.hexapetalum* 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) | 278.71±2.37 | 103.18±1.22 | 62 |
| Chloroform extract 100 mg/kg | 436.45±1.18 | 205.34±1.54 | 54 |
| Chloroform extract 200 mg/kg | 343.65±0.32 | 143.65±1.39 | 57 |
| Alcohol extract 100 mg/kg | 451.53±0.73 | 203.86±1.43 | 55 |
| Alcohol extract 200 mg/kg | 370.63±0.69 | 151.47±1.21 | 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 *Alangiumsalvifolium sub sp.hexapetalum*. 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 have 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. Alkaloids,triterpenoids, phenols,flavanoids, and saponins 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 *Alangiumsalvifolium sub sp.hexapetalum* could account for the CNS depressant activity.

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