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EVALUATION OF MEMORY ENHANCING ACTIVITY OF ECLIPTA ALBA

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ABSTRACT

Short and long term memory loss may result from deteriorating cerebral mechanisms due to varied causes which could have a tremendous impact on the quality of life. Herbs are being constantly explored to resolve cognitive deficits. *Eclipta alba* (Ea) is being examined for its memory enhancing quality as it is traditionally used for this purpose. The shade dried root and stem of *Eclipta alba* was extracted with distilled ethanol. The suspension of Ea containing 100 and 200 mg/kg was administered to mice to evaluate Transfer Latency (TL) on an elevated plus maze. TL was a measure of acquisition and retrieval learning. The results revealed significant improvement of retrieval memory.

KEYWORD: Eclipta alba, Transfer latency, bhringaraj.

INTRODUCTION

Eclipta alba (Linn.) Hassk,is commonly known as False Daisy or Bhringaraj. It is a creeping and moisture loving herb commonly found on roadsides and waste lands throughout India. The plant has been reported to contain phytosterol, β-amyrin, triterpenes such as ecalbatin, echinocystic acid, ursolic acid, flavones such as Luteolin and coumarin such as wedelolactone. The plant is known to have some important pharmacological activities such as hepatoprotective, antimicrobial, antinociceptive, analgesic, antiinflammatory, antiviral, immunomodulatory and nootropic activity. Phytochemically, *Eclipta alba* is rich in

wedeoloctone, β- amyrin, stigmasterol and luteolin-7- glucoside. Traditionally, it is being used as a memory modulator and we are scientifically validating this claim by measuring transfer latency and spatial habitual learning. Lack of neural plasticity can generate pertinent cognitive deficits which indeed can affect the quality of life. In order to circumvent this problem, memory elevators are being constantly explored, of which herbs play a vital role. However, fewer reports are available with respect to the pharmacological properties of the plant. Keeping this in view, the present study has been undertaken to investigate the memory enhancing activity of ethanolic extract of *Eclipta alba* in standard animal models.

METHOD

Collection of plant material

The root and stem of *ECLIPTA ALBA* were collected from Alappuzha district in kerala in month of April 2017. After washing with water the root were dried for 10 days in shade. Then they are weighed and kept in airtight container and stored in refrigerator for future use.

Preparation of extract

Maceration (steady state extraction): In maceration (for fluid extract), whole or coarsely powdered plant-drug is kept in contact with the solvent in a stoppered container for a defined period with frequent agitation until soluble matter is dissolved. This method is best suitable for use in case of the thermolabile drugs

Procedure

About 25g of shade dried powdered material was added with 250ml ethanol. The container was shaked for every half an hour for period of 24 hours. The extract was filtered, concentrated and dried. This dried viscous material obtained was used for the analysis. Suspension of this extract containing 100 and 200mg/kg were prepared using aqueous tragacanth solution (2%) and it was administered orally.

Qualitative phytochemical screening

The different qualitative chemical tests were performed on the ethanolic extracts of *Eclipta alba* root for establishing chemical profile and detected various phytoconstituents. The preliminary phytochemical screening of methanol extract was carried out for the detection of alkaloids, saponins, coumarines, sterol, terpene, flavanoids and tannins using standard.

Safety evaluation

Aqueous extract of *Eclipta alba* was administered to 10 mice in a dose of 2g/kg, and observations were made for gross behavioral changes such as locomotion, rearing,respiration, tremors, gait, passivity, righting reflex, lacrimation and mortality for 14days.

Animals

To measure transfer latency 15 mice were used. They were divided into three groups randomly with each group containing 5 animals.

Group 1: served as a control

Group 2: received 100mg/kg of aqueous extract of Ea orally 60min. prior to the experiment.

Group 3: received 200mg/kg of aqueous extract of Ea orally 60min. prior to the experiment.

Transfer latency using elevated plus maze. The animals were placed individually on the maze which consists of two open arms, which lies opposite to each other. The maze is elevated to a height of 50 cm.60 min after drug administration the animal was placed at the end of the open arms facing away from the centre of the maze and the time to move from the open arm to the closed arm was recorded as transfer latency (TL). The recording was done on the first day and after 24 hours for 90seconds. TL on the first day served as a measure of acquisition learning and TL after 24hrs for retrieval or explicit learning. Transfer latency (TL) was defined as the time taken by the animal to move from the open arm into one of the covered arms with all its four legs.

Statistical analysis

The statistical analysis of data was done by one way ANOVA followed by Scheffes test . $P<0.05$ was considered as the level of significance.

RESULTS

Phytochemical screening

The chemical tests indicates the presence of alkaloids, saponins, coumarines, sterol, terpene, flavanoids and tannins.

Acute toxicity studies

In acute oral toxicity studies no mortality was recorded in these animals upto 14 days. Thus the extract was non toxic upto 2000mg/kg.

Memory enhancing activity

Aqueous extract of *Eclipta alba* at a dose of 100and 200mg/kg produced a significant decrease in transfer latency measured using EPM after 24 hours in comparison with the control indicating significant improvement on learning and memory.

Sl.no	Treatment	Number of animals used	Route of administration	Transfer latency (sec)	
				Day-1	Day-2
1	Control	5	Oral	63± 0.34	50±1.26
2	100mg/kg AE of Ea	5	Oral	53± 0.46	26±0.68
3	200mg/kg AE of Ea	5	Oral	44±0.56	22±0.38

AE OF Ea - aqueous extract of *Eclipta alba*

DISCUSSION

The present study was conducted to find out the memory enhancing activity of root and stem extract of *Eclipta alba*. In acute toxicity testing no mortality was observed in mice. Eclipta alba produces a significant reduction in the transfer latency when tested after an interval of 24 hours in the elevated plus maze indicating that it improves the ability to retrieve information and therefore strengthens explicit memory.

CONCLUSION

The usefulness of *Eclipta alba* in the treatment of memory enhancing activity has been scientifically validated by the results of the present study. The study indicates that the root extract of *Eclipta alba* has memory enhancing activity and the data obtained will be basis or further studies and applications of this plant.

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