

ANTICONVULSANT EFFECT OF *ERYTHRINA INDICA* LAM

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**Summary**

Ethanol, Chloroform and Ethyl acetate extracts of leaves of *Erythrina indica* were prepared by cold maceration technique. The phytoconstituents such as alkaloids, carbohydrates, glycosides, flavonoids, phytosterols, phenols and tannins were identified by standard procedure. Anti convulsant activity was studied against maximal electroshock (MES) and Pentylenetetrazol (PTZ) induced convulsions in mice. All the extracts showed significant ( $P < 0.05$ ) anti convulsant activity. Ethanol extract has been found to have prominent activity when compared to other extracts. Key words: *Erythrina indica*, Leaves, anti convulsant, MES, PTZ, mice.

**Introduction**

*Erythrina indica* is a middle sized quick growing tree found in Bengal and many parts of India especially in southern India. It belongs to the family Papilionaceae, commonly known as Mandara (in Hindi) and Indian coral tree (in English). The leaves, barks and juice of flowers are used traditionally for the treatment of various ailments such as Liver trouble, Joint pain, Dysentery, Convulsion, etc.,<sup>1,2,3</sup>. However no scientific study has been reported on anticonvulsant activity of leaves of *Erythrina indica*. Thus the present study was aimed to prove its folklore use as anti convulsant.

## Materials and Methods

### Plant collection and authentication

The plant materials were collected from Madurai District, Tamilnadu, India during the month of march 2005. The plant was duly authenticated by Dr. Stephen, Dept. of Botany, The American College, Madurai, Tamilnadu, India. A voucher specimen (EI1) has been kept in our laboratory for future reference.

### Preparation of the extract

The air dried leaves were pulverized using mechanical grinder in to coarse powder and extracted exhaustively with Ethanol (90%), Ethyl acetate and Chloroform by cold maceration for 16 days. These extracts were concentrated under reduced pressure and preserved in desiccators until further use. Preliminary phytochemical analysis<sup>4,5</sup> were carried out to find out the phytoconstituents present in the crude extracts.

### Anticonvulsant activity

Albino rats (Wistar strain) of both sexes (150-250gm) were used in the study. The animals were provided with standard pellet diet with free access to water *adlibitum*. The protocol for the present study was approved by institutional animal ethics committee (Approval no. 509/02/C/CPCSEA).

The animals were divided into five groups of six each. Group I received 10 % aqueous tween 80 (p.o), Group II received Phenytoin (25 mg/kg i.p.)/ diazepam (2.0 mg/kg, *i.p.*), Group III received ethanol extract (250 mg/kg i.p.), Group IV received chloroform extract (250 mg/kg i.p.) and Group V received ethyl acetate extract (250 mg/kg i.p.) .

### Maximal electroshock induced seizures<sup>6</sup>:

30 min after drug administration maximal electroshock seizures are elicited by the application of electric shock (42 mA, 0.2 sec) using corneal electrodes. Abolition of the hind limb tonic extensor spasm was recorded as a measure of anticonvulsant activity. Phenytoin (25 mg/kg i.p.) was used as reference standard.

### Pentylenetetrazol-induced seizures<sup>6</sup>:

30 min after drug administration, seizure was induced by subcutaneous injection of PTZ (80 mg/kg) and the mice were observed for onset of myoclonic spasm and clonic convulsions. Diazepam (2.0 mg/kg, *i.p.*) was included as a reference standard. The animals were observed for onset of convulsion up to 30 min after PTZ administration.

Table 1: Effect of ethanol, ethyl acetate and chloroform extract of Leaves of *Erythrina indica* on Pentylenetetrazol and MES-induced seizures in mice.

Treatment	Dose	Onset of clonic convulsion in min (Mean $\pm$ S.E.M)	Extensor convulsion (in sec.) Mean S.E.M
Tween 80(10%)	-	7.2 $\pm$ 0.6831	33.73 $\pm$ 1.72
Phenytoin	25mg/kg	-	16.56 $\pm$ 1.05*
Diazepam	2 mg/kg	A	-
Ethanol extract	50 mg/kg	12.26 $\pm$ 0.79*	25.19 $\pm$ 0.96*
	150mg/kg	17.67 $\pm$ 0.65*	19.67 $\pm$ 0.57*
	250mg/kg	A	16.69 $\pm$ 0.37*
Ethyl acetate extract	50 mg/kg	10.72 $\pm$ 1.32*	29.36 $\pm$ 1.49*
	150mg/kg	13.21 $\pm$ 2.49*	26.51 $\pm$ 0.73*
	250mg/kg	A	25.35 $\pm$ 0.34*
Chloroform extract	50 mg/kg	11.82 $\pm$ 1.32*	27.68 $\pm$ 0.46*
	150mg/kg	15.27 $\pm$ 1.50*	25.47 $\pm$ 0.76*
	250mg/kg	A	21.36 $\pm$ 0.27*

n=6, \*P<0.05 were considered significant, A-Absence of convulsion

### Statistical analysis

The student "t" value was employed for statistical analysis. All the values expressed were Mean  $\pm$  S.E.M. P< 0.05 was considered significant.

### Results and Discussion

Preliminary phytochemical analysis revealed the presence of alkaloids, carbohydrates, glycosides, flavonoids, phytosterols, phenols and tannins in all the three extracts. Convulsion induced by MES and PTZ were identified by tonic-clonic and tonic-extensor seizures. Treatment with ethanol, ethyl acetate and chloroform extract of Leaves of EI showed significant protection against MES and PTZ induced seizures in a dose dependent manner (table 1). The activity was compared using standard drugs such as Phenytoin for MES induced convulsion and Diazepam for PTZ induced convulsion. Ethanol extract have been found to have prominent activity when compared to ethyl acetate and chloroform extract.

The observations emanated in the present study indicated that the EI extracts possessed anticonvulsant activity against seizures induced by MES and PTZ. Protection against MES and PTZ suggested that EI is useful in suppressing generalized tonic-clonic and tonic-extensor seizures. It was thought that epileptic

drugs inhibit seizure by regulating GABA mediated synaptic inhibition<sup>7</sup> and /or by blocking post-synaptic 5-HT receptors and /or by inhibiting serotonergic transmission<sup>8</sup>. Mechanism involved and active constituent responsible for the seizure protective effect of EI is under study. However, the results of the present animal study indicated that *Erythrina indica* possesses anticonvulsant activity, and thus lend pharmacological support to the suggested folkloric, ethno medical uses of the plant's extract in the treatment, management and/or control of epilepsy.

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