ANTIPYRETIC AND CNS DEPRESSANT ACTIVITIES OF 
ERYTHRINA VARIEGATA LEAVES EXTRACTS

Murugalakshmi. M¹, Mari Selvi. J¹ Valli. G¹ & Thangapandian. V²

¹Department of chemistry, The Standard Fireworks Rajaratnam College for women, Sivakasi, Tamil Nadu, India.
²Department of Microbiology, Ayya Nadar Janaki Ammal College, Sivakasi, Tamil Nadu, India.

ABSTRACT

The Erythrina variegata extracts were prepared from Erythrina variegata leaves in water, ethanol and ethylacetate by Soxhlet Extraction using standard procedure. Erythrina Variegata, belongs to the family Fabaceae. Erythrina variegata was found in many tropical and subtropical region. The medicinal importance of Erythrina Variegata plant species human ailments as revealed by literature resources prompted as to focus on pharmacological activities of Erythrina Variegata leaves extract and the following results were found. Because of these reasons the Erythrina Variegata leaves extracts could be used as a potential Antipyretic and CNS depressant activities in pharmaceutical preparations in future. Animals were divided into four groups each consisting of eight animals. Group 1 served as control, group 2 received standard drug. Group 3 received 200 mg/kg and 400 mg/kg of water extract and Group 4 received 200 mg/kg and 400 mg/kg of ethanol extract and Group 5 received 200 mg/kg and 400 mg/kg of ethylacetate extracts of Erythrina variegata. For the determination of antipyretic and CNS depressant activity. The results obtained showed that the extracts were found to exhibit significant antipyretic and CNS depressant activities. Present study highlights the significant antipyretic and CNS depressant activities of the water, ethanol and ethylacetate extracts of Erythrina variegata leaves. The antipyretic activity of water extract of Erythrina variegata leaves shows (200mg/kg) showed slightly less (1.5%) activity than that of the standard (1.9%). CNS depressant activity of ethyl acetate extract shows higher activity than the standard drug Chlorpromazine, water and ethanol extract of Erythrina variegata leaves so in future this may be used as standard CNS depressant drug.

Keywords: Erythrina variegata, antipyretic,CNS depressant activity, paracetamol.
INTRODUCTION

Plants have been used in treating human diseases for thousands of years. Plants which have one or more of its organs containing substances that can be used for the therapeutic purpose are called medicinal plants.\textsuperscript{[1]} It plays a significant role in ancient systems of medication in many countries. In recent times, focus on plant research has increased all over the world and large body of evidence has collected to show immense potential of medicinal plants used in various traditional systems. Use of plant based drugs and chemicals for curing various ailments and personal adornment is as old as human civilization.

*Erythrina variegata* belonging to the family Fabaceae is commonly known as ‘Kalyan-Morangai’(Tamil), ‘Indian coral tree’ (English), ‘Palitamadar’(Bengali), ‘Pharahada, Pangara’(Hindi), ‘Paribhadraka, Kantakimsuka’ (Sanskrit) is a medium-sized deciduous small tree with prickly stems and branches, leaves with triangular leaflets and large coral red flowers and grows all over Bangladesh. Different parts of *Erythrina variegata* have used in traditional medicine as nervine sedative, febrifuge, anti-asthmatic and antiepileptic. (Anwar \textit{et al.}, 2006.) The leaves are used in fever, inflammation and joint pain. The juice of the leaves is used in ear ache, tooth ache (Ghani, 1998) constipation, (Anonymous.2002) cough (Ghosal, \textit{et al.}, 1972.) and also known to stimulate lactation and menstruation. Leaves and Juice are being used in the traditional system of medicine for the treatment of various ailments such as liver trouble, convulsion, arthritis, etc. (Nadkarni, \textit{et al.}, 1992; Kiritikar, \textit{et al.}, 1991).\textsuperscript{[2]}

An Indian preparation of *Erythrina variegata* leaves is used to destroy pathogenic parasites and relieve joint pain. Juice from the leaves is mixed with honey and ingested to kill tapeworm. Roundworm and threadworm. Women take this juice to stimulate lactation and menstruation. A warm poultice of the leaves is applied externally to relieve rheumatic joint pains.\textsuperscript{[3-7]} The bark is used as a laxative, diuretic and expectorant. Different parts of plant are used in traditional medicine as nervine sedative, collyrium, in ophthalmia, anti-asthmatics, antiepileptic, antiseptic and as an astringent. Bark is used in fever, liver ailment and rheumatism. The leaf juice used to heal wounds and sores. Leaf paste applied for muscular pain in cattle. Leaf extract possess nematicidal property. The root extract possess antimicrobial activity. Bark is astringent to strychnine. Its leaves are aperient; they also encourage the start of menstruation and milk secretion. The bark is helpful in gallstone, liverishness, an expectorant, febrifuge, and vermifuge.\textsuperscript{[8-11]} Many bioactive compounds have been isolated from different parts of Erythrina variegata. Knowing the importance, the
present work deals with the determination of antipyretic and CNS depressant studies of Erythrina variegata leaves water, ethanol and ethylacetate extracts.

MATERIALS AND METHODS

Materials used

Collection of plant material

The leaves of *Erythrina variegata*, were collected from S.F.R College for women sivakasi in virudhunagar district and dried in shade. These were then powdered and stored in air tight container at room temperature until further use.

Collection of chemicals

The solvents such as ethanol, ethylacetate, Benzene, Methanol and water were used. They were purchased from Ganapathy scientific equipments, Srivilliputtur.

Drugs and Reagents

Paracetamol (standard for antipyretic) and Chlorpromazine (standard for CNS depressant activity).

Animals used

Wistar Albino rats (150-180mgs) were selected for these studies. Eight rats were taken for each group. The rates were used after an acclimatization period of 7 days to a laboratory environment. They were provided with food and water.

Methods used

Preparation of plant extract

The coarsely powdered leaf drug of *Erythrina variegata* about 15g was extracted with water, ethanol, ethyl acetate by continuous extraction method using soxhlet apparatus for 6 hrs. The water, ethanol, ethyl acetate extract was concentrated to a dry mass by using water bath. A greenish brown colour residue was obtained.
The *Erythrina variegata* leaves extract were then undergone to, Preliminary qualitative phytochemical and pharmacological activities like antipyretic and CNS depressant activities.

**ANTIPYRETIC ACTIVITY**[^12,13,14]

Three groups of four animals of albino rats of both sexes of weight 100-165g were used for the study. The animals were kept in polypropylene cages in a room maintained under controlled atmospheric conditions. The animals were fed with standard diet (Hindustan liver, Mumbai, India) and had free access to clean drinking water. Antipyretic activity was measured by Brewer’s induced pyrexia model in rats. Rats were fasted overnight with water ad lib before the experiments. Pyrexia was induced by subcutaneously injecting 20% w/v brewer’s yeast suspension (10 ml/kg) into the animals dorsum region. Eighteen hours after the injection, the rectal temperature of each rat was measured using a digital thermometer. Only rats that showed an increase in temperature of at least 0.7°C were used for the experiments. Animals were divided into 3 groups, each containing four animals. Group II received the standard drug (received Paracetamol 33mg/kg i.p) Group III received water extract of *Erythrina variegata leaves* (200mg/kg, p.o). Group-IV received water extract of *Erythrina variegata leaves* (400mg/kg, p.o). Group-V received Ethanol extract of *Erythrina variegata leaves* (200mg/kg, p.o). Group-VI received Ethanol extract of *Erythrina variegata leaves* (400mg/kg, p.o). Group-VII received Ethyl acetate extract of *Erythrina variegata leaves* (200mg/kg, p.o). Group-VIII received Ethyl acetate extract of *Erythrina variegata leaves* (400mg/kg, p.o). The temperature was measured at 1,2,3 and 4hr after drug administration. The recorded values were listed in **Table-1**.

**CNS DEPRESSANT ACTIVITY**

**CNS depressant activity determination**

Two standard neuropharmacological experimental methods viz. motor coordination and locomotor methods were employed to determine the CNS depressant activity.

**Preparation of the drug for the experimental study**

Extracts and the standard drugs were administered in the form of suspension in water with 1% Sodium Carboxy Methyl Cellulose (SCMC) as suspending agent.

**Effect on locomotor activity**

Locomotor activity was recorded with a using a digital activity cage (Actophotometer). The animals were divided into eight groups (n = 8). Each rat was individually placed in the actophotometer for 10 min. Animals of group 1 were intraperitoneally treated with Caffeine.
Group 2 was treated orally with Chlorpromazine 3 mg/kg (i.p.). Group 3 was treated orally with water residue of *Erythrina variegata* leaves (200 mg/kg) dose levels of drugs. Group 4 was treated orally with water residue of *Erythrina variegata* leaves (400 mg/kg). Group 5 was treated orally with ethanol residue of *Erythrina variegata* leaves (200 mg/kg) Group 6 was treated orally with ethanol residue of *Erythrina variegata* leaves (400 mg/kg). Group 7 was treated orally with ethyl acetate residue of *Erythrina variegata* leaves (200 mg/kg). Group 8 was treated orally with ethyl acetate residue of *Erythrina variegata* leaves (400 mg/kg). Basal reaction time was noted before and 30 min after the administration of treatment. Account is recorded when the beam of light falling on the photocell of actophotometer is cut off by rat Sample 1 received reference standard chlorpromazine at a dose of 3 mg/kg (i.p.) 30 min before the test. Mean change in the locomotor activity was recorded for each group. The recorded values were listed in Table-2.

RESULT AND DISCUSSION

Table 1- Effect of water (1), ethanol (2) and ethylacetate (3) extracts of *Erythrina variegata* leaves of rectal temperature (°C) in albino rats

<table>
<thead>
<tr>
<th>Drug treatment</th>
<th>Dose (mg/kg)</th>
<th>Rectal temperature after yeast administration (°C)</th>
<th>Basal reaction time after drug administration (in )</th>
<th>Reduction in rectal temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Normal 18 hrs 1 hr 2 hr 3 hr 4 hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control saline</td>
<td>5 mg/kg p.o</td>
<td>37.2±0.0 4714 39.025±0.2021 39.225±0.223 39.27±0.288 39.25±0.2688 29.25±0.2427</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Standard paracetamol</td>
<td>33 mg/kg p.o</td>
<td>37.25±0. 0745 39.05±0.2135 38.6±0.1054 38.1±0.1054 37.62±0.1093 37.2±0.471 1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>200 mg/kg p.o</td>
<td>37.3±0.1 054 39.14±0.700 38.775±0.0986 38.35±0.1528 37.92±0.0745 37.65±0.0745 1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 mg/kg p.o</td>
<td>37.35±0.1527 38.875±0.144 38.625±0.1658 38.25±0.1915 37.92±0.0726 37.65±0.1374 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethanol</td>
<td>200 mg/kg p.o</td>
<td>37.325±0.1527 39.225±0.06 38.9±0.0471 38.75±0.0577 38.52±0.0289 38.15±0.745 1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 mg/kg p.o</td>
<td>37.425±0.0986 39.025±0.553 38.85±0.1 38.6±0.0817 38.45±0.1 38.32±0.1280 0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethylacetate</td>
<td>200 mg/kg p.o</td>
<td>37.225±0.2229 39.25±0.0745 39.075±0.0289 39.92±0.0533 38.75±0.0333 38.62±0.0553 0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 mg/kg p.o</td>
<td>36.975±0.10929 39.3±0.0472 39.1±0.0817 38.97±0.0726 38.75±0.0745 38.55±0.0745 0.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table-2 Effect of water (1), ethanol (2) and ethylacetate (3) extracts of Erythrina variegata leaves of CNS depressant activity

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose</th>
<th>Mean time(in seconds)+SEM Before</th>
<th>Mean time(in seconds)+SEM After</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (saline)</td>
<td>5ml/kg</td>
<td>17.75±0.9860</td>
<td>15.75±0.5528</td>
<td>11.26%</td>
</tr>
<tr>
<td>Standard Chlorpromazine</td>
<td>10mg/kg</td>
<td>62.25±0.9860</td>
<td>54.75±1.4434</td>
<td>12.04%</td>
</tr>
<tr>
<td>Water</td>
<td>200mg/kg</td>
<td>134.75±9.2062</td>
<td>92.5±1.9721</td>
<td>31.35%</td>
</tr>
<tr>
<td></td>
<td>400mg/kg</td>
<td>124±5.7350</td>
<td>84±3.1624</td>
<td>32.25%</td>
</tr>
<tr>
<td>Ethanol</td>
<td>200mg/kg</td>
<td>93.75±0.9860</td>
<td>70.75±1.2802</td>
<td>24.53%</td>
</tr>
<tr>
<td></td>
<td>400mg/kg</td>
<td>46.25±0.9860</td>
<td>44.5±1</td>
<td>3.78%</td>
</tr>
<tr>
<td>Ethyl Acetate</td>
<td>200mg/kg</td>
<td>131±1.8258</td>
<td>96±1.6997</td>
<td>26.71%</td>
</tr>
<tr>
<td></td>
<td>400mg/kg</td>
<td>55.5±1.2019</td>
<td>19.75±1.2802</td>
<td>64.41%</td>
</tr>
</tbody>
</table>

**ANTIPYRETIC ACTIVITY**

The reduction in temperature from 39.05 to 37.2 for 33 mg/kg for paracetamol and 39.1 to 37.65 for 200 mg/kg of extract (1) and 38.87 to 37.65 for 400 mg/kg for extract (1) and 39.22 to 38.15 for 200 mg/kg of extract (2) and 39.02 to 38.32 for 400 mg/kg for extract (2) and 39.25 to 38.62 for 200 mg/kg of extract (3) and 39.3 to 38.55 for 400 mg/kg for extract (3) were observed. The reduction in temperature for the extract (1) have shown slightly less (1.5°C) activity than that of the standard (1.9°C).

**CNS depressant activity**

The dose dependent depression in the locomotor activity was found to be 12.04% for 10 mg/kg of chlorpromazine and 31.35% for 200mg/kg of extract (1) and 32.35% for 400mg/kg of water extract (1) and 24.53% for 200mg/kg of extract (2) and 3.78% for 400mg/kg of extract (2) and 26.71% for 200mg/kg of extract (3) and 64.41% for 400mg/kg of extract (3) were observed. The above three plant extracts the extract (3) (400mg/kg) showed the highest CNS depressant activity (64.41%) than that of the standard Chlorpromazine (12.01%).

**CONCLUSION**

The medicinal importance of *Erythrina variegata* plant species for various human ailments as revealed by literature resources, prompted as to focus on pharmacological activities of *Erythrina variegata leaves* extract and the following results were found. Antipyretic activity of water extract was found to appreciable when compared to ethanol and ethylacetate extract of *Erythrina variegata* so in future this may be used as potential antipyretic drug in pharmaceutical preparations. CNS depressant activity of ethyl acetate extract shows higher
activity than the standard drug Chlorpromazine, water and ethanol extract of Erythrina variegata leaves so in future this may be used as standard CNS depressant drug.

REFERENCE