

Phytochemical and Anti-Pyretic Activity of Eclipta Alba in Albino Rats

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ABSTRACT

Eclipta alba (Family - Asteraceae) is an erect or prostrate annual herb distributed throughout India in wet or moist wastelands, ascending to altitude of 2000 M. cylindrical stems are 2 – 5 mm in diameter, dark green in colour, and show longitudinal ridges. E. alba is used as traditional medicine for the treatment of numerous ailments such as gastrointestinal disorders, respiratory tract disorders (asthma), hair loss, graying of hair, liver disorders plus jaundice, skin disorders, spleen enlargement, cuts and wounds. To extend its therapeutic activity the antipyretic activity study was taken by using the yeast induced pyrexia rat model, but before this test the acute toxicity study was also taken for safety purpose. All these studies were taken by the supervision of IAEC by following the OECD guidelines. The hydro-alcoholic extract of E. albaleafs 250 mg/body weight studied for their Anti-pyretic effect by yeast induced pyrexia method and found that the extract was showing maximum effect, using paracetamol as standard. The result showed that the hydro alcoholic-extract of E. alba has significant antipyretic effect.

Keywords: E. alba, herb, traditional medicine, pyrexia

I. INTRODUCTION:

Eclipta alba, a plant belonging to the Asteraceae family, is an annual herb that grows upright or prostrate and can reach heights of 2000 meters. It is found in wet or moist wastelands in India. The cylindrical stems have longitudinal ridges, are dark green in color, and range in diameter from 2 to 5 mm. Sessile and opposite in nature, leaves typically have an oblong lanceolate shape with appressed hair on both surfaces. Yellowish disc florets and white, compact ray florets are seen in small flowerheads.^[1] Many conditions, including gastrointestinal issues, respiratory tract issues (asthma), hair loss, graying of the hair, liver problems including jaundice, skin

conditions, enlarged spleen, cuts, and wounds are treated with it in traditional medicine.^[2]

Plant profile –

Botanical name: Eclipta alba Linn.

Taxonomic classification:^[3]

- Kingdom – Plantae
- Subkingdom – Viridaplantae
- Division – Tracheophyta
- Subdivision – Spermatophytina
- Order – Asterales
- Family – Asteraceae
- Genus – Eclipta
- Species – alba

Vernacular names:^[4]

- Sanskrit – Kesaraja
- Odia - Bhrungaraja
- Bengali – Kesari, Bheemraja
- Gujrati – Bhangaro
- Hindi – Bhangara
- Kannada – Garujalu
- Malayalam – Kayyonni
- Marathi – Bhangra, Maka
- Tamil – Karisalai
- Telugu – Guntagalagara

II. MATERIAL & METHOD

Materials: Healthy albino rats, Hydro-alcoholic extract of Eclipta alba, Distilled water, Feeding tube, Thermometer, Disposable syringe, Dried yeast and Paracetamol

Collection of plant: The plant was collected from Balighat, an area in Odisha's Puri district, and it is collected in the month of December.

Drying and Pulverization: The collected leafs of Eclipta albawere dried at room temperature, then pulverized it to obtain a coarse powder.

Authentication: The herbarium was prepared and was sent to Department of Botany, Gangadhar Meher University, Sambalpur, Odisha – 768001 for proper authentication.

The sample was identified to be as *Eclipta alba* Linn.

Methods:

Preparation of extracts: The first stage in evaluating phytochemicals is extraction, which introduces the secondary metabolites and requires polar or solvents for extraction. After a thorough washing, fresh leaves were dried in the shade. After that, *E. alba* leaves were pulverized, and more research was done.

Physical Evaluation – Physical evaluation of *Eclipta alba* leaf were conducted, including assessment of Foreign organic matter, Loss on drying, Extractive value, Ash value, Swelling index and Foaming index.

Phytochemical screening:

Phytochemical screening is the scientific process of analyzing, examining, extracting, experimenting, and thus identifying different classes of phytoconstituents present in various parts of the base for the discovery of drugs.^[5] Here the phytochemical study was conducted to identify the different phytochemicals present in *E. alba*.

Pharmacological Screening:

In traditional medicine, *E. alba* is used to cure a wide range of conditions, including skin disorders, spleen enlargement, gastrointestinal disorders, respiratory tract disorders (including asthma), hair loss, graying of the hair, liver problems including jaundice, and cuts and wounds.^[6]

Acute toxicity was also studied for safety purposes prior to the antipyretic activity investigation, which was conducted using a yeast-induced pyrexia rat model in an effort to increase the drug's therapeutic activity. All of these investigations were conducted under IAEC supervision while according to OECD rules.

Acute toxicity study:

Acute toxicity studies are carried out in two mammalian species to ascertain the short-term negative effects of a medicine when it is given as a single dosage or as many doses over the course of a 24-hour period.^[7]

The acute toxicity was performed according to OECD guidelines. The selected albino rats were used for toxicity studies. The animals were divided into four groups of three in each. The animals were fasted overnight prior to the acute experimental procedure. Extract was given orally to rats at the graded doses like 400, 700 and 1000 mg/kg body weight. Immediately, after dosing, the

animals were observed continuously for first four hours for behavioural changes and for mortality at the end of 24 hrs.

Control:

The animals marked group- 1 received orally 10ml/kg of body weight of distilled water and served as control.

Test:

The animals marked group- 2, 3 & 4 received orally 400mg/kg, 700mg/kg, 1000mg/kg body weight of hydro-alcoholic extract respectively.

Anti-pyretic effect:

The substances that lower a raised body temperature are called antipyretics. The genesis of yeast-induced pyrexia, also known as pathogenic fever, is the synthesis of prostaglandins, which lower the temperature of the thermoregulatory center.^[8]

The body's thermoregulatory set-point is elevated by endogenous or exogenous pyrogens, leading to fever. Exogenous heat exposure or endogenous heat production cause the body's temperature to rise uncontrollably in hyperthermia, but the set-point remains unchanged.^[9]

Healthy Wistar strain albino rats weighing about 150-200 grams were taken. The rats showing 94.4 ± 0.26 were selected. Then they were fasted for 18hrs before inducing pyrexia. Pyrexia was induced by injecting subcutaneously 15% w/v suspension of yeast (1 ml / 100 gm. Body weight) and they were allowed to feed. The animals were divided into 6 groups of 6 each and numbered.

10 hrs later rectal temperature was recorded using a clinical thermometer by introducing 1 inch the rectum and keeping it inside for 1 minute. The temperature first recorded after 18 hrs of yeast administration was taken as zero-hour reading.

The control, standard and test substances were given to the animals by feeding needle. After the drug was administered, the temperature of all the rats in each group was recorded at an interval of 0, 1, 2 & 3 hrs. The mean temperature was found out for each group and compared with the value of standard drug.

Control:

The animals marked group-1 received distilled water 10 ml/100gm of body weight orally and served as control.

Standard:

The animals marked group-2 received paracetamol 250mg/kg body weight orally in distilled water and served as standard.

Test:

The animals marked test group-3 to 6 received hydro-alcoholic extract 250mg/kg body weight.

III. RESULT&DISCUSSION:

In Physical evaluation of the powder showed 0.3% foreign organic matter, 13.2% moisture, 18.83% total ash, 11% water-soluble ash and 11.5% acid-insoluble ash. 18.75% water soluble extractive, 9% methanol extractive, 3% ethanol extractive, 3% petether extractive, 2%, 0% and 2% chloroform, n-hexane and ethylacetate

extractive respectively. Foaming index and swelling index show negative result.

The leaf powders were subjected to successive extraction in Soxhlet apparatus by using water and ethanol solvents. Chemical tests on Hydro-alcoholic extract and powdered material showed the presence of Carbohydrates, Alkaloids, Proteins, Glycosides and Amino acids.

According to the findings of the acute toxicity trial, there was neither toxicity nor death after an oral dose of 1000 mg/kg of extract observed in rats that were tested.

E. albawas found to have no mortality at a dose of 1000 mg/kg body weight in an acute toxicity investigation. The Hydro-alcoholic extract of leafs 250 mg/body weight studied for their Anti-pyretic effect by yeast induced pyrexia method and found that the extract was showing maximum effect, using paracetamol as standard.



Fig. 1 – Eclipta alba plant leaves



Fig. 2 – Eclipta alba plant flower



Fig. 3 – Anti-pyretic activity test in Rat

Table No. 1: Parameters of Physical evaluation

Parameters	Values (%)
Foreign organic matter	0.3
Loss on drying	13.2
Water soluble extractive	18.75
Methanol soluble extractive	9
Ethanol soluble extractive	3
Petroleum ether soluble extractive	3
Chloroform soluble extractive	2
n-hexane soluble extractive	0
Ethyl acetate soluble extractive	2
Total ash	18.3
Water soluble ash	11
Acid insoluble ash	11.5
Foaming index	Less than 100
Swelling index	Negative

Table No. 2: Results of Phytochemical screening

Chemical Tests	Powdered drug	Hydro-alcoholic extract
Test for carbohydrates		
Molisch's test	+	+
Fehling's test	-	-
Test for alkaloids		
Wagner's reagent	+	+
Hager's reagent	+	+
Dragendroff's reagent	+	+
Test for Glycoside		
Modified Borntrager's test	-	-
Legal's test	+	+
Test for Proteins and Amino acids		
Millon's test	+	+
Hydrolysis test	+	+
Xanthoproteic test	+	+
Test for Tannins		
Ferric chloride test	-	-
Gelatine test	+	+
Test for starch	-	-
Test for steroids & Triterpenoids test		
Sulfur powder test	+	+
Test for Naphthoquinones		
Dam-Karrer test	-	-

Note: + ve indicates positive result, whereas - ve indicates negative result

Table No. 3: Anti-pyretic effect of leaves of Eclipta alba Linn.

Sl. NO.	Dose	Initial Temperature	0 Hour	1 Hour	2 Hour	3 Hour
1.	Control	94.4 ± 0.26	99.3 ± 0.31	99.5 ± 0.33	99.0 ± 0.32	97.7 ± 0.30
2.	Standard (Paracetamol)	95.6 ± 0.28	99.5 ± 0.22	97.6 ± 0.24	96.3 ± 0.25	95.7 ± 0.30
3.	Test	94.0 ± 0.30	99.1 ± 0.28	97.6 ± 0.32	95.7 ± 0.34	94.2 ± 0.26

IV. CONCLUSION:

Traditional medicine is “The knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, used in the maintenance of health and in the prevention, diagnosis, improvement or treatment of physical and mental illness”. Here I did an Anti-pyretic study because a growing number of people are turning to herbal therapy as the allopathic medications usually used for fever treatment have several negative effects. *E. alba* Linn., is one such plant which is traditionally used in the treatment of fever was selected for the present study.

Anti-pyretic activity of hydro-alcoholic extract was carried out on healthy Wister strain albino rats. The extract showed significant anti-pyretic activity at the dose of 250mg/kg body weight and the effects were comparable with the standard drug.

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