

PHYTOCHEMICAL AND PHARMACOLOGICAL POTENTIAL OF *ECLIPTA ALBA*: A REVIEW

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ABSTRACT

Eclipta alba Hassk (Asteraceae) having important role in the traditional Ayurvedic, Unani systems of holistic health and herbal medicine of the east. Its main active constituents are wedelolactone, demethylwedelolactone . The important pharmacological activities are Hepatoprotective, Antimicrobial, Antinociceptive, Anti-inflammatory, Analgesic, Immunomodulatory, Antiviral and C.N.S. activity. This paper explains the evidence-based information regarding the phytochemistry and pharmacological activity of this plant.

KEYWORDS: *Eclipta alba*, Phytochemistry, Pharmacological activity.

INTRODUCTION

Eclipta alba Hassk is a small evergreen tree with wide geographical and ecological distribution , and its certain parts are used as medicinal materials. *Eclipta alba* are drought evergreen plants of the family Asteraceae. This plant grows as a common weed through India, ascending to 1800m in the Himalayas common in areas of upper gangetic plains, in pasture lands, roadsides in chota Nagpur, all districts of Bihar and Orissa, Punjab, Western India, and South India¹.

Eclipta alba, entirely pubescent herb. Stem cylindrical, with longitudinal ridges, 2-5cm in diameter, dark green in colour. Leaves opposite, sessile, usually oblong, lanceolate, margin entire or dentate, Capitulum white 2-6 mm in diameter. Achenes elliptical and flattened, 2-3 mm long, brown to pale brown. Odour slight; taste, slightly salty².

PHYTOCHEMICAL CONSTITUENTS

The dried leaves of *Eclipta alba* have been reported to contain coumestan derivatives; wedelolactone and demethylwedelolactone, stigmasterol, α -terthienylmethanol, desmethyl-wedelolactone-7-glucoside, unnamed alkaloid, apigenin, luteolin and their glucoside, wedelic acid, 25- β -hydroxyverazine, ecliptine and nicotine.

Roots of *Eclipta alba* have been reported with thiophene acetylenes such as 5I-senecioid oxymethylene-2-(4-isovaleryloxybut-3-ynyl)-dithiophene, 5I-tigloyloxymethylene-2-(isovaleryloxybut-3-ynyl)-dithiophen and 2-(3-acetoxy-4-chloro-but-1-ynyl)-5-(pent-1,3-diynyl) thiophene, hentriacontanol, stigmasterol, ecliptal, 14-heptacosanol.

Stems of *Eclipta alba* contain wedelolactone, wedelic acid, L-terthienyl methanol, apigenin, luteolin.

Seeds of *Eclipta alba* contain sterols.

Aerial parts gave β -amyrin, luteolin-7-0-glucoside. In addition the aerial parts is reported to contain apigenin, cinnaroside, sulfur compounds, phytosterol, β -amyrin in the n-hexane extract, luteolin-7-glucoside and wedelolactone in polar solvent extract.

Twigs of the plant have been reported to contain an unnamed alkaloid.

Whole plant of *Eclipta alba* contain ecliptal (a terthienyl aldehyde), 2-angeloyloxy methylene-5¹-(but-3-en-1-ynyl) dithiophene, 5-isovaleryloxy methylene-2-(4-isovaleryloxy-but-3-ynyl) dithiophene, isoflavonoids wedelolactone, desmethylwedelolactone, 7-O-glucoside, nicotine, alkaloid and stigmasterol. Bioassay guided fractionation of the methanolic extract of *Eclipta alba* using yeast strains resulted in the isolation of six new steroidal alkaloids. Abdel Kader was identified new alkaloids as 20-epi-3-dehydroxy-3-oxo-5,6-dihydro-4,5-dehydroverazine, ecliptalbine [(20R)-20-pyridyl-cholesta-5-ene-3- β -23-diol], (20R)-4- β -hydroxyverazine, 4- β -hydroxyverazine, (20R)-25- β -hydroxyverazine and 25- β -hydroxyverazine³⁻²¹.

PHARMACOLOGICAL ACTIVITIES

Hepatoprotective Activity

The coumestan constituents of the plant wedelolactone and demethylwedelolactone are responsible for the potent antihepatotoxic activities in carbon tetrachloride, galactosamine and phalloidin induced liver damage in rats²²⁻²³.

C. N. S. Activity

Studies indicated that the aqueous extract of *Eclipta alba* and its hydrolyzed fraction at a dose of 300 mg/kg and 300 mg/kg p.o. respectively showed nootropic activity in rats²⁴.

Antimicrobial Activity

The shoot extract showed antibacterial activity against staphylococcus aureus and *Eclipta Coli*²⁵.

Antinociceptive Activity

A hydro-alcoholic extract of the plant showed antinociceptive effect in a dose of 200 mg/kg in rats due to the coumarin compounds²⁶.

Anti-inflammatory and Bronchodilator Activity

The plant has been reported to possess anti-inflammatory and bronchodilator activities, due to the coumarin compounds²⁶.

Analgesic Activity

The ethanolic extract and total alkaloids produce good analgesic activity in albino mice by tail clip and tail flick method and the acetic acid induced writhing response²⁷.

Immunomodulatory Activity

Preliminary studies revealed the immunomodulatory activity of methanolic extract of *Eclipta alba*. Wedelolactone and demethylwedelolactone isolated from *Eclipta alba* exhibited trypsin inhibition in vitro. Both compounds showed potent activity with IC₅₀ values of 2.9 and 3.0 μ g/ml, respectively²⁸⁻²⁹.

Antiviral Activity

The alcoholic extract has shown antiviral activity against Ranikhet disease³⁰.

Hair Growth Activity

Quantitative analysis of hair growth after treatment with petroleum ether extract (5 %) exhibited greater number of hair follicles in anagenic phase (69 + 4) which were higher as compared to control (47 + 13). Treatment with 2% and 5 % petroleum ether extracts were better than the positive control minoxidil 2% treatment³¹⁻³².

Antioxidant Activity

Methanolic extract of the aerial parts of *Eclipta alba*, exhibited significant free radical scavenging capacity for DPPH and for hydroxyl radical.³³⁻³⁴

Antihyperglycemic Activity

It has also been reported that in alloxan induced diabetic rats the oral administration of the leaf suspension of *Eclipta alba* in a dose of 2 and 4 gm/kg resulted in significant reduction in blood glucose, glycosylated hemoglobin, and an increase in the activity of liver hexokinase.³⁵

Wound healing Activity

Ethanolic extract of leaves *Eclipta alba* has been evaluated for its wound healing activity in either anaesthetized wistar rats at two different doses [150 and 300 mg/kg] using incision, excision and dead space wound model. Enhanced wound healing activity may be due to free radical scavenging action of the plant and the enhanced level of antioxidant enzymes in granuloma tissue³⁶⁻³⁷.

Antifungal Activity

Whole plant extract of *Eclipta alba* has been investigated against *Candida tropicalis*, *Rhodotorula glutinis* and *Candida albicans*³⁸.

Miscellaneous Activity

Wedelolactone and its analogues evaluated as inhibitors of kidney Na⁺, K⁺- ATPase and ligands for the central benzodiazepine [BZP] receptor.³⁹

CONCLUSION

In recent years, traditional uses of natural compounds especially of plant origin received much attention as they are well tested for their efficacy and generally believed to be depicted the fact that it is a popular remedy among the various Ayurvedic and traditional practitioners for treatment of ailments. Researchers are exploring the therapeutic potential of this plant as it has more therapeutic properties which are not known.

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