

Eclipta alba (L.) Hassk: A Valuable Medicinal herb

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Abstract

Herbs are staging a comeback and herbal 'renaissance' is happening all over the globe. The herbal products today symbolise safety in contrast to the synthetics that are regarded as unsafe to human and environment. Although herbs had been prized for their medicinal, flavorings and aromatic qualities for centuries, the synthetic products of the modern age surpassed their importance, for a while. The plant *Eclipta alba* Hassk (Asteraceae) known for its medicinal values in alternative systems of (Ayurvedic, Unani, Sidha, Homeopathy, Chines) holistic health and herbal medicine. *Eclipta alba* Hassk is reported to possess Hepatoprotective, antimicrobial, anti-inflammatory, analgesic, immuno-modulatory, antiviral and promoter for blackening and growth of hair. Important source of chemicals is wedelolactone, demethylwedelolactone exhibit antihepatotoxic activities. This review article elucidates the evidence based information regarding the photochemistry and pharmacological activity of this plant.

Keywords: *Eclipta alba*, Bhringraj, Asteraceae, Wedelolactone, Hepatoprotective.

Introduction

Plants remain a major source of medicinal compounds. About 20,000 plant species are used for medicinal purposes¹. Seventy four percent of plant derived drugs were discovered as a result of chemical studies to isolate the active substances responsible for their traditional use². So plants, especially the higher plants contain a variety of substances, which are useful as food additives, perfumes, and in treatment of various diseases as medicine due to their versatile therapeutic potential³. The active secondary metabolites possess various medicinal applications as drugs or as model compounds for drug synthesis.

Eclipta alba (L.) Hassk. (syn. *Eclipta prostrata* L.) commonly known as **False Daisy** and **bhringraj** is a plant belonging to the family Asteraceae. It is an erect or prostrate, much branched, roughly hairy, annual herb.

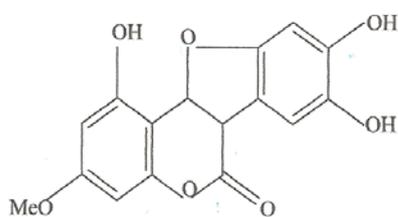
Root is tap root, Stem is herbaceous, branched, nodes brown in color, and presence of white trichomes and cylindrical. Leaves are sessile to sub-sessile, opposite, 2.2-8.5 cm long, and

1.2-2.3 cm wide usually oblong, lanceolate, sub-acute or acute, with appressed hair on both surfaces. Inflorescence is heterogamous head with companulate involucre of bracts, bracts biseriate, and the outer broader; receptacle flat with slender plumose palea. Ray florets are pistillate, disc florets are bisexual; Pappus is very minute, corolla of the pistillate flower is ligulate and two lipped and those of bisexual flowers is tubular with five lobes; stamens five epipetalous, syngenesious; ovary inferior, unilocular. Achenes of ray florets triquetrous, warded and those of disc are compressed.

Vernacular Names: Bhangaara (Hindi), maakaa (Marathi), bhangaro (gujaraati), kesuriya (Bengali), galagara (Telugu).

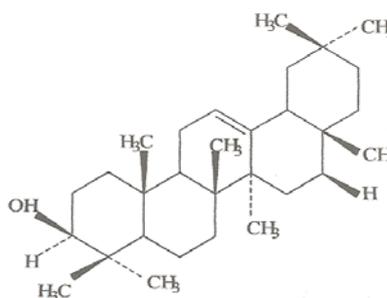
Active Principle of the Plant

Phytochemical studies on *Eclipta* revealed the presence of Alkaloids like ecliptine and nicotine⁴, and Bio-active steroidal alkaloids verazine, dehydroverazine ecliptalbine⁵.Dried leaves have been reported to contain Coumarins like wedelolactone(Fig.1) and its derivative⁶, demethylwedelolactone ,isodemethylewedelolactone and strycholactone⁷.Many Hydrocarbons like ecliptal⁸, α -formylterthienyl⁹.Whole plant is said to have many Triterpenene like saponin,eclalbatin,along with α -amyrin(Fig.2) β -amyrin(Fig.3),ursolin acid (Fig.4),oleanolic acid(Fig.5) and wedelic acid¹⁰six new oleanane triterpene glycosides,eclalbasaponins I-VI are also reported to be present in the whole plant¹¹.Roots contain Polyacetylenic Thiopenes 5' seneciyoxyethylene-2-dithiophene , 5'-tigloyloxyethylene-2-dithiophene¹².Sterols reported are phytosterol, β -glucoside of phytosterol,daucosterol and stigmasterol-3-o-glucoside(Fig.6) in the entire plant body⁷.Flavonoids like apigenin (fig.8),luteolin(Fig.9)and luteolin-7-glucoside(Fig.10)⁷.



Structure of Wedelolactone

Fig.1



Structure of α -amyrin

Fig.2

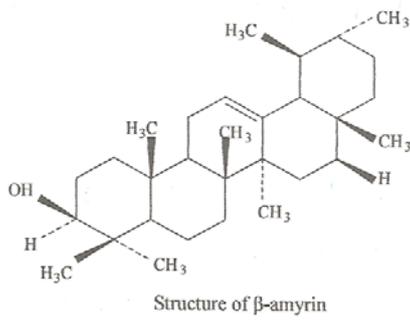


Fig.3

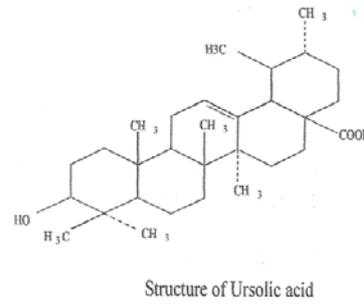


Fig.4

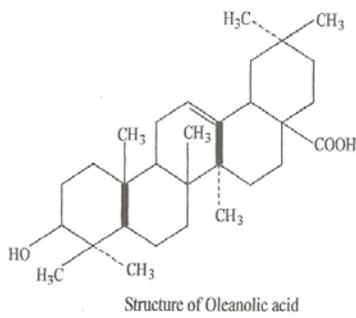


Fig.6

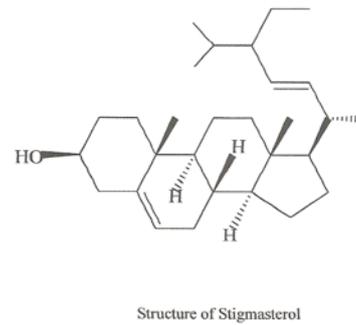


Fig.7

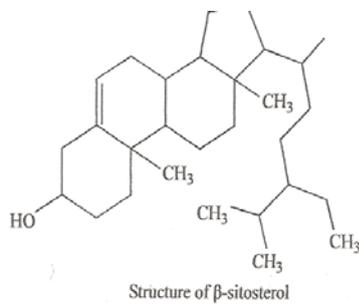


Fig.8

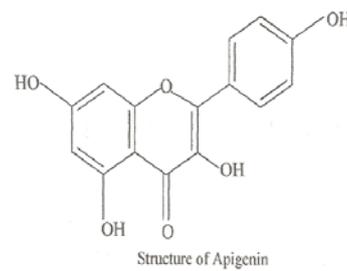


Fig.9

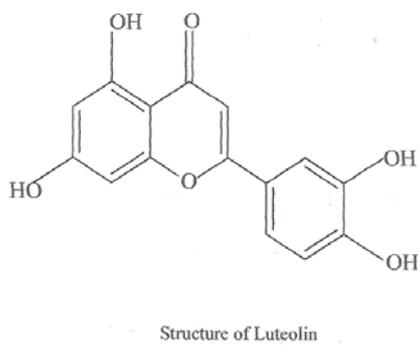


Fig.10

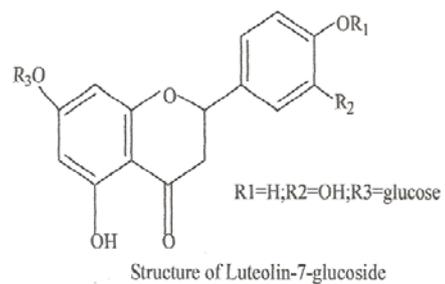


Fig.11

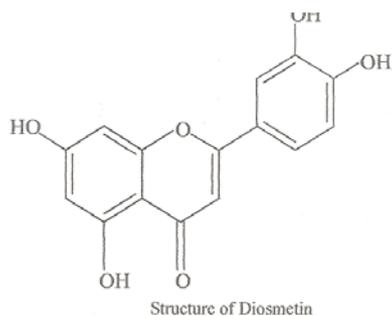


Fig.12

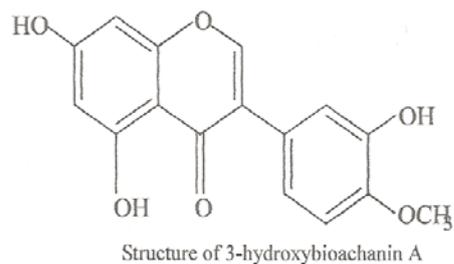


Fig.13

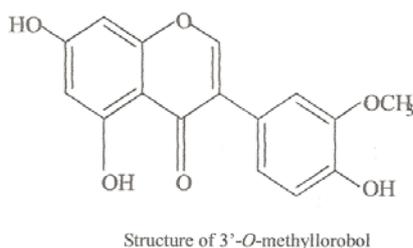


Fig.14

Traditional Therapies

Ayurveda

Eclipta alba is acrid, bitter hot and dry, reduced kapha and vata and is a good rejuvenator .

Ayurvedic Energetics: Rasa: Pungent (Katu, Tikta), Veerya Bitter (Usna): Vipaka: Heating (Katu):

Pharmacological activities of the chemical constituents:

S.No	Chemical constituents	Pharmacological activates	Plant Part
1	Wedelolactone	Antihepatotoxic, Antibacterial, Trypsin Inhibitor, Antivenom	Leaves
2	Eclalbosaponins	Hair revitalizing, Antiproliferative, Antigiardial	Whole Plant
3	Demethylwedelolactone	Antihepatotoxic, Antihemorrhage, Antivenom, Dye (cosmetic)	Leaves
4	Dasyscyphin C	Antiviral, Anticancer	Stem
5	Eclalbatin	Antioxidant	Root Plant
6	Ecliptalbine, verazine	Lipid lowering,	Stem

Guna: Light, Dry (Ruksha, Tikсна)

Doshagnata - Kaphavatashamaka

Rogagnata - Shleepada, Granthi, Vrana, Kshala, Netraroga, Palitya, Kesharoga, Bhrama, Naktandhya, Kamala, Arsha, Ajeerna, Kushtha, Kilasa, Jwara, Kasa, Pandu, Shotha, Shwasa, Daurbaya, Charmaroga.

Karma - Vatahara, Kaphahara, Amahara, Balya, Rasayana, Kesya, Tvacya, Dantya, Caksusya, Visahara^{13,14}.

Pharmacological Action: Hepatic deobstruent and tonic, alterative, emetic, purgative, antiseptic, antiviral, Bhringaraj is commonly used as a deobstruent to promote bile flow and to protect the liver, good hair, skin, expels intestinal worms, cures asthma, cough and strengthens body.

Formulations

Kayyanyadi Tailam: Swarasa of Bhringaraja, Amritha And Dhatri 8%, Yashti (Kalka) 2.26%, Thailam 84%, Milk 5%, Anjana (Pathrapakam) 0.58%

Grahani Mihira Tailam: Contains 12 gm drug/ 4 litres of taila. Recommended in case of fevers, acidity problems and respiratory problems.

Nilakadya Tailam: Contains 12 gm drug/ 3 litres of taila. Used for abhyanga (bath)

Nilibrngadi Tailam: Contains Bhringaraja svarasa – 768 ml/ 6.5 liters used externally for headache¹⁶.

Unani

In Unani system, the juice of *E. alba* is used in 'Hab Miskeen Nawaz' along with aconite (*Croton tiglium*), "triphala" (*Piper nigrum*, *Piper longum*, *Zingiber officinale*) and minerals like mercury, sulphur, arsenic, borax etc. for various types of pains in the body. It is also a constituent of 'Roghan Amla Khas' for applying on hair, and of Ma'jun Murrawah-ul-arwah¹⁷.

Sidha

The leaves are ground and prepared into a karkam (paste) and mixed with the leaf juice of this plant. It is then added into gingelly oil and boiled to proper patham or paste and the oil is extracted. This oil is applied daily over the head and is helpful to cure hair loss, body pain and diminution of vision. The samoolam (root) of this plant is ground and the juice from it is given in the dose of 20-30 ml daily twice for hepatomegally, splenomegally, indigestion, jaundice etc. Root powder is given internally in the dose of 5 gram daily for diseases of liver, spleen and skin diseases. The leaves are ground well and the karkam prepared from it is

rubbed well and tied as a bandage over the site of scorpion bite. The steam coming from the leaves with boiling water is exposed over pile mass. The leaves are ground with gingelly oil and applied over the inflamed limb due to filariasis.

For haematuria, the leaf juice in the dose of 5-15 ml is given daily twice a day. The 2-3 drops of leaf juice is mixed with equal quantity of honey and given internally to infants for common cold.

The choornam (powder) of samoolam (root) of this plant is given as an adjuvant with Aya chendooram is a very effective remedy for anemia, dropsy and jaundice. For intestinal worms one ounce of castor oil is mixed with 1/2 ounce of karisalai juice is given internally early morning or alternate days. Samoolam of this plant is made into choornam (powder) and 2-5 grams of this is given internally for one month with tender coconut water and second month with honey. This medicine is a kayakarpam.

Chinese

Eclipta alba: Han lian cao (prostrata)

Eclipta is one of the few "yin tonics" among Hawaiian medicinals.

Korea: The plant is used as an antidote for snake bites in Korea ¹⁸.

Philippines: A decoction of the dried plant is used for haemoptysis and haematemesis. For dysentery and haematuria urine, a decoction of the dried herb or tincture is used. Medicated tea or tinctures are used as household remedies for sprains, furuncle and dermatitis; the tea or tincture is excellent ¹⁹.

Nepal: Plant juice, mixed with an aromatic (essential oil), is used in the treatment of catarrhal problems and jaundice. The leaves are used in the treatment of scorpion stings ²⁰.

Clinical Studies

Anti aggressive effect: Significant minimization of aggression was reported using *Eclipta alba* with 100 & 200mg/KG in foot shock induced test ²¹.

Analgesic effect: Studies suggested good analgesic activity in albino mice by tail clip and tail flick method and the acetic acid induced writhing response by the ethanolic extract and total alkaloid including ecliptine, nicotine, verazine etc ²².

Anti-inflammatory and Bronchodilator Activity: Coumarin compound like wedelolactone, dimethylwedelolactone-7-glucoside and nor-wedelolactone contribute for anti-inflammatory and Bronchodilator activity ^{23,24}.

CNS Activity: Studies indicate that the aqueous extract of *Eclipta alba* and its hydrolyzed fraction at a dose of 300mg/kg and 30mg/kg p.o., respectively showed notropic activity ²⁵.

Antibacterial studies: Studies reveal that wedelolactone; can be used effectively to treat *Salmonella epidermidis* and *Salmonella typhimurium* infections²⁶

Antiviral Activity: The alcohol extract has shown antiviral against Ranikhet disease²⁷.

Hair Growth Activity: Quantitative analysis of hair growth after treatment with petroleum ether extract²⁸.

Antioxidant Activity: Methanol extract of the aerial parts of *Eclipta alba*, show significant free radical scavenging capacity for DPPH and for hydroxyl radical²⁹.

Antihyperglycemic Activity: It has 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 gms/Kg resulted in significant reduction in blood glucose, glycosythemoglobin.

Antihyperlipidemic activity: It has been reported that in the atherogenic diet induced hyperlipidemic model, the aqueous leaf extract of *Eclipta prostrata* was given orally to the rats which significantly reduced total cholesterol, triglycerides & total protein.³¹

Anticancer activity: Studies reveal that the methanolic extract of *Eclipta alba* showed anticancer activity in the tested animal model.³²

Conclusion

Eclipta alba is easily propagates and a much common herb. The plant has antiviral, antibacterial, spasmogenic, hypotensive ovicidal, antioxidant, antimyotoxic antihemorrhagic also known to be used as rejuvenating, age sustaining tonic. It is found to be a wonder drug for spleen and liver enlargement, catarrhal jaundice, hyperacidity, gastritis, dysentery, night blindness, eye diseases, toothache, laxative. In general *Eclipta alba* is for blackening and growth of the hair. High therapeutic and medicinal values are due to its chemical composition with wedelolactone, demethylwedelolactone, 14-hepatocosanol, luteolin-7-O-glucoside, alkaloids and polypeptides as principle components. Because of its varied medicinal values it has great commercial demand which calls for further investigation at the biomolecular level. For the same reason, this species needs prime attention for cultivation and conservation.

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