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 priced 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 purposes\(^1\). Seventy four percent of plant derived drugs were discovered as a result of chemical studies to isolate the active substances responsible for their traditional use\(^2\). 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 potential\(^3\). 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

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1.2-2.3 cm wide usually oblong, lanceolate, sub-acute or acute, with apprised hair on both surfaces. Inflorescence is heterogamous head with compandate involucre of bracts, bracts biseriatic, 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, wartaed 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 nicotine[^4^], and Bio-active steroidal alkaloids verazine, dehydroverazine ecliptalbine[^5^]. Dried leaves have been reported to contain Coumarins like wedelolactone(Fig.1) and its derivative[^6^], demethylwedelolactone, isodemethylwedelolactone and strycholactone[^7^]. Many Hydrocarbons like ecliptal[^8^],α-formylterthienyl[^9^]. Whole plant is said to have many Triterpenes like saponin,eclalbatin, along with α–amyrin(Fig.2)β-amyrin(Fig.3), urosolin acid (Fig.4), oleanolic acid(Fig.5) and wedelic acid[^10^] six new oleanane triterpene glycosides, eclabalasaponins I–VI are also reported to be present in the whole plant[^11^]. Roots contain Polyacetylenic Thiopenes[^12^] 5′ senecioyloxymethylene-2-dithiophene, 5′-tigloyloxymethylene-2-dithiophene. Sterols reported are phytosterol,β-glucoside of phytosterol, daucosterol and stigmasterol-3-o-glucoside(Fig.6) in the entire plant body[^7^]. Flavonoids like apigenin (fig.8), luteolin(Fig.9) and luteolin-7-glucoside(Fig.10)^[^7].
**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:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Chemical constituents</th>
<th>Pharmacological activates</th>
<th>Plant Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wedelolactone</td>
<td>Antihepatotoxic, Antibacterial, Trypsin Inhibitor, Antivenom</td>
<td>Leaves</td>
</tr>
<tr>
<td>2</td>
<td>Eclalbosaponins</td>
<td>Hair revitalizing, Antiproliferative, Antigiardial</td>
<td>Whole Plant</td>
</tr>
<tr>
<td>3</td>
<td>Demethylwedelolactone</td>
<td>Antihepatotoxic, Antihaemorrhage, Antivenom, Dye (cosmetic)</td>
<td>Leaves</td>
</tr>
<tr>
<td>4</td>
<td>Dasysephylin C</td>
<td>Antiviral, Anticancer</td>
<td>Stem</td>
</tr>
<tr>
<td>5</td>
<td>Eclalbatin</td>
<td>Antioxidant</td>
<td>Root Plant</td>
</tr>
<tr>
<td>6</td>
<td>Ecliptalbine, verazine</td>
<td>Lipid lowering</td>
<td>Stem</td>
</tr>
</tbody>
</table>
**Guna:** Light, Dry (Ruksa, Tiksna)

**Doshaghnata** - Kaphavatashamaka


**Karma** - Vatahara, Kaphahara, Amahara, Balya, Rasayana, Kesya, Tvacya, Dantya, Caksusya, Visahara.

**Pharmacological Action:** Hepatic deobstruent and tonic, alterative, emetic, purgative, antiseptic, antiviral, Bhringraj 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 headache.

**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-arwah.

**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 diminishment 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.

**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.

**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.

**Clinical Studies**

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

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

**Anti-inflammatory and Bronchodilator Activity**: Coumarin compound like wedelolactone, dimethylewedelolactone-7-glucoside and nor-wedololactone contribute for anti-inflammatory and Bronchodilator activity.

**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.
**Antibacterial studies**: Studies reveal that wedelolactone; can be used effectively to treat *Salmonella epidermidis* and *Salmonella typhimurium* infections.²⁶

**Antiviral Activity**: The alcohol extract has shown antiviral against Ranikhet disease.²⁷

**Hair Growth Activity**: Quantitative analysis of hair growth after treatment with petroleum ether extract.²⁸

**Antioxidant Activity**: Methanol extract of the aerial parts of *Eclipta alba*, show significant free radical scavenging capacity for DPPH and for hydroxyl radical.²⁹

**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, glycosytemoglobin.

**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, antimonytoxic antihamorrhagic 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-7-0-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.

**REFERENCE**