PLANT PROFILE

Plant profile of *Eclipta alba* (L.) Hassk

Botanical Name: *Eclipta alba* Hassk

Synonym: *E. prostate*, Trailing *Eclipta*

Family: Asteraceae

Habitat: *E. alba* is an herbaceous annual herb, 30 - 50 cm high, erect or prostrate, much branched, strigosely hirsute, often rooting, distributed throughout India in wet or moist waste lands, ascending up to 2000 m altitude.

Parts used: The herb (whole plant, roots, seeds and seed oil)

Fig. 2. 1. Plant habitat of *Eclipta alba* Hassk.

Fig. 2. 2. Inflorescence of *Eclipta alba* Hassk.
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**Description**

**Macroscopic**

**Whole plant**: It is a small herb, pleasant and aromatic to the taste, covered all over with white stift hairs, prostrate or erect, darkish brown colour.

**Root**: Well developed, fibrous and much branches arise from main root, upto about 7 mm diameter, cylindrical shape and grayish white

**Stem**: Cylindrical or flat stems are 2-5 mm diameter, dark greenish, occasionally brownish colour and shows longitudinal ridges,
Plant profile

herbaceous, rough rooting nodes due to oppressed white hairs, node
distinct.

**Leaf** : Sessile to subsessile, sub-entire, sub-acute or acute, opposite 2.2-8.5
cm long, 1.2-2.3 cm wide, usually oblong lanceolate, strigose with
oppressed hairs on both surfaces

**Flower** : Small flower heads contains white compressed ligulate ray florets
and yellowish disc florets tubular, solitary and together on unequal
axillary peduncles or terminal in pairs, pedicelled and stalked,
involucral bracts about 8, ovate, obtuse or acute, herbaceous, strigose
with oppressed hairs, spreading, scarcely as long as bracts, corolla
often 4 toothed, pappus absent, except occasionally very minute
teeth on the top of achene, stamen 5, filaments epipetalous, free,
anthers united into a tube with base obtuse, pistil bicarpellary, ovary
inferior, uni-ocular with one basal ovule.

**Fruit** : Achenial cypsela, one seeded, cuneate, with a narrow wing, covered
with warty excrescences, brown.

**Seed** : Dark brown colour, hairy and non endospermic, 0.2-0.25 cm long,
0.1 cm wide, wedge shaped or compressed and marked by a ridge in
the middle of both surfaces, taste acrid, odour disagreeable.

**Microscopic**

The transverse section of *E. alba* plant parts observed following characters.

**Root** - Mature root shows poorly developed cork, consisting of 3-5 rows of thin-walled,
tangentially elongated cells, secondary cortex consists of outer one or two rows of
tangentially elongated or rounded cells with air cavities, inner secondary cortex of
tangentially elongated irregular shaped, parenchymatous cells with conspicuous air
cavities, stone cells found scattered in secondary cortex and cork in singles or in groups
of various shape and size, pericyclic fibres in tangentially arranged bands of many cells
or in singles, secondary phloem consists of sieve elements including phloem fibres
traversed by multiseriate phloem rays, phloem rays broader towards periphery, consisting of rounded cells, xylem composed of vessels, fibre tracheids, fibres and xylem parenchyma, traversed by xylem rays, vessels numerous, found scattered throughout wood, in macerated preparation vessels small, drum-shaped, cylindrical elongated with very pitted walls and perforations, simple, rarely slightly oblique, fibre tracheids, pitted with very pointed tips, xylem fibres long with pointed tapering ends and short lumen, a few fibres show peg-like triangular having simple pits on their walls, xylem ray distinct, run straight in tangential section, generally 5-32 cells in width although very rarely uniseriate and biseriate rays also found, ray cells pitted.

**Petiole** - The upper and lower epidermis consisting of tubular cells shows single layer and covered with striated cuticle, two types of trichomes are observed, non-glandular, uniseriate, 1-5 celled, warty with apical cell, epidermis followed by wide cortex, consisting of 2-5 layered collenchymas on both, upper and lower side with distinct angular thickening, parenchyma 4-6 layered on upper side and 5-8 layered on lower side consisting of isodiametric, thin-walled cells with intercellular spaces, five vascular bundles central one largest while four others small flanking to either side of central bundle, consists of xylem on dorsal side and phloem on ventral side, xylem vessels arranged in radial rows traversed by xylem rays.

**Midrib** - Cut at basal region shows both upper and lower single layered epidermis, externally covered with cuticle, a few epidermal cells elongate outwards to form uniseriate hairs, epidermis followed by cortex, consisting of 3-5 layered collenchymatous cells on both sides, section cut at middle region shows 3-4 layered collenchymatous cells on dorsal and 1-3 layered on ventral side, while the section cut at apical region, shows 2 layered collenchymatous cells on both sides, similarly transverse section cut at a basal, middle and apical regions shows 4-6 layered parenchymatous cells on dorsal side and 6-9 layered parenchyma on ventral side, in section cut at basal region 4-6 layered parenchyma on both the sides in the middle region with thin-walled cells and intercellular spaces, 2-3 layered parenchymatous cells on both side in the apical region, in the basal region section shows vascular bundle similar to that of petiole while in the section cut at middle and apical region section shows 4 smaller bundles shifting towards lamina.
**Stem** - Mature stem shows single layered epidermis, externally covered with cuticle, a few epidermal cells elongate to form characteristic non-glandular tichomes, the cork where formed, poorly developed consisting of rectangular cells, secondary cortex composed of large, rounded or irregular shaped parenchymatous cells having wide air spaces, endodermis single layered consists of tangentially elongated cells, pericyclic fibres distinct, arranged in tangential strands, vascular bundles in a ring, collateral, endarch, of varying sizes traversed by medullary rays, phloem a narrow strip composed of sieve elements and phloem parenchyma, xylem vessels appear evenly distributed throughout the xylem, in macerated preparation vessels barrel-shaped, some elongated with simple perforations, pitted with spiral thickening, xylem fibres with wide lumen, pointed tips and pitted walls, a few often bifurcate and a few other large, peg-like outgrowth, xylem parenchyma rectangular with pitted thickening, xylem rays triseriate to pentaseriate, normally biseriate and uniseriate, 8-15 cells in height and 3-5 cells in width, centre occupied by a wide pith consisting of isodiametric cells of parenchyma.

**Powder** - Dark green, shows vessels in large groups or single broken pieces with pitted walls, numerous fibres entire or in pieces, trichomes entire or in pieces, warty, a few attached with epidermal and subsidiary cells, anomocytic and anisocytic stomata.
Plant profile of *Lippia nodiflora* Linn.

**Botanical Name**: *Lippia nodiflora* Linn

**Synonym**: *Phyla nodiflora* (Linn), Greene

**Family**: Verbenaceae

**Habitat**: A small creeping perennial herb, rooting at the nodes, found commonly in sandy wet places along bunds of irrigation channels, canal edges and river banks almost throughout greater part of India ascending up to 900 m on the hills.

**Used in**: Ayurveda, Unani and Siddha.

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**Fig. 2.3. Plant habitat of *Lippia nodiflora* Linn.**

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**Fig. 2.4. Inflorescence of *Lippia nodiflora* Linn.**
Language - Vernacular Names

Beng : Bukkana, Kaanchadaa, Bhui-okra
Eng : Purple Lippia
Guj : Ratveliyo, ratoliya
Hindi : Bakkan, bhuiokra, jalapapili, ludra
Kan : Nela-hippali
Mal : Nitrippali, Podutalai
Mar : Jalapimpali, ratalio, ratoliya, vekkan
Oriya : Bukkan
Tam : Btutalai, caivam, celakirakani, celakkiranitipanam, cempucattumuli, cetitta, civakarnanki, ilatimi, kampanatakara, kattuttippilli, kirumutalatai, katikaccirukam, mulakalakkoti, podutalai, podutalei, poduthalai, kudineer, poduthuvalai, potkalam, potutalai, purcatam, putatalia, talaiibodam, talaipotaka.
Tel : bokenaku, bokkena
Sans : Jalalipalika, Tpoyavallari, Saradi, Masydani, Masyagandha
Urdu : bukun booti

Distribution

It is distributed in India, Sri Lanka, Ceylon, Baluchistan, South and Central America and Tropical Africa. It is native of California. In India, it is found in the warmer parts including Andhra Pradesh, Karnataka, Kerala and Maharashtra, some parts of Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. It is common in wet places along bunds or irrigation canal edges and river banks.
Description

Macroscopic

Root - Fibrous, branched, brown in colour, 2 to 10 cm in length and 1.0 to 1.5 mm in diam, nodal roots are smaller, 0.5 to 1.0 cm in length and unbranched.

Stem - Much branched, sub quadrangular, 1 to 2 mm in diameter, rooting at nodes, more or less clothed with appressed two armed, white hairs when seen under 10x, brownish-green, length of internode 5.0 to 9.0 cm.

Leaf - Opposite, sub-sessile, 1.5 to 3.7 cm long and 1 to 2 cm broad, spathulate, cuneate at the base, deeply and sharply serrate in the upper part, appressed by two armed, white minute hairs on both sides.

Flower - Sessile, densely packed in long pedunculate axillary spikes, mature ones 1.0 to 2.0 cm long and 0.4 to 0.5 cm broad, flowering densely becoming oblong during fruiting, penduncles 2.5 to 7.5 cm long, bracts about 2.5 mm long, broadly elliptic or obovate, cuneate at base, mucronate, glabrous, calyx 2.0 mm long, membranous, bilobed, compressed, mitre-shaped, pubescent underneath with ordinary trichomes closely covering the fruit, the acuminate lobes projecting beyond it, corolla 2.5 to 3.0 mm long, white or light pik, billipped, upper lip erect and bifid, lower lip 3 lobed of which the middle lobe largest, falling off as a calyptras when fruits ripens, stamens 4, didynamous, anthers 2-celled, dehiscing longitudinally, dorsifixed ovary superior, bicarpellary, ovules in each cell solitary, style short, stigma oblique, subcapitate.

Fruit - Small, 1.5 to 2.0 mm long, globose, oblong, splitting into two, 1-seeded plano-convex pyrenes, seeds exalbuminous about 1 mm in size.

Microscopic

Root - T.S. shows slightly wavy outline composed of a single layered epiblema, cortex 6 to 9 call deep, most of the outer cortical cells in the nodal roots contain chloroplast, some of the cortical calls towards the inner side are thick walled, phloem cells are irregularly thick walled ma consisting of sieve tubes, companion cells and phloem parenchyma, xylem composed of vessels, tracheids parenchyma and fibers, vessels are variable in size,
range in diameter from 16 to 65 µ, medullary rays about 2 or 3 cells in width, cells are pitted, pith absent.

**Stem** - T.S. shows a nearly quadrant outline with ridges and deep furrows, striated cuticle, a single layer of epidermis with cells longer than broad, surface possesses unicellular trichomes with two unequal arms which usually gets detached cortex is about 7 cells deep in the furrows, mainly chlorenchym while those of ridges are of collenchymas, a few cells contain amorphous inclusions and many inner cells contain chloroplast, endodermis observed, pericycle 2 or 3 layers of cells, thick walled, phloem compressed and 5 or 6 cells deep, xylem a continous ring, broader at the troughs. Pith large, composed of thin walled parenchymatous cells, central usually degenerated, but several others may occasionally contain a few chloroplasts.

**Leaf** - Isobilateral epidermis single layered followed by a layer of palisade cells, occasionally, a layer palisade also occurs adjacent to the lower epidermis, in surface view, the epidermal cells have straight walls, stomata diacytic, present on both lower and upper surface, but more in number on lower surface, covering and glandular trichomes occur on both the surfaces, unicellular, 2 unequally armed warty trichomes, with pointed tips are frequent on both the surfaces, midrib vascular bundle possesses xylem on dorsal side and phloem on ventral side, stomatal index of upper and lower surface 11 to 18 and 18 to 30 respectively, the palisade ratio of upper surface 6 to 11 and that of lower 8 to 13.

**Powder** - Greenish-brown, fibrous, free, flowing, characterized by the presence of glandular hairs, 2 armed trichomes which are usually attached to a epidermal cell from the slightly protruded stalk present in the middle, trichomes warty, leaf epidermis characterized by the presence of circular trichomes scars, vessels and palisade cells.