

Appraisal of Seedling Morphology in relation to Taxonomy of *Coleus amboinicus*

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Abstract

This paper provides information on morpho taxonomic observations of juvenile stages and seedlings in *Coleus amboinicus* Wall. ex Benth. Seedling morphology was observed upto 5th leaf stages. Morphological features of seedling like collet, hypocotyle, epicotyle, shape and arrangement of paracotyledons, leaf base, colour, phyllotaxy, number of veins etc. represent high level of constancy within taxon and, thus, have been found useful from taxonomic point of view in identification and eradication of weed at juvenile stage. *Coleus amboinicus* is a species of semi- succulent, perennial plant in the family Lamiaceae. It has a pungent Oregano like flavor and odor. *Coleus amboinicus* is considered to be native to parts of Africa, the Arabian Peninsula, and India, although it is widely cultivated and naturalized elsewhere in the tropics where it is used as a spice and ornamental plant. *Coleus amboinicus* (also known as Indian Borage, Cuban Oregano, or Mexican Mint) is a fleshy, aromatic perennial herb in the mint family ([Lamiaceae](#)), prized for its oregano-like flavor and pungent scent, used in cooking, traditional medicine (for coughs, colds, digestion), and as an ornamental plant, with its distinctive fuzzy leaves easily rooting to spread, making it a popular addition to herb gardens in tropical climates. The species epithet, *amboinicus* refers to [Ambon Island](#), in Indonesia. In 1747, 45 years after his death, a volume written by [Georg Eberhard Rumphius](#) was published, including the plants he called *Marrubium album Amboinicum*, with the local name *Daun hati hati*. He had encountered them in Ambon and the [Banda Islands](#), both cultivated in gardens and growing wild. In 1790, the [Linnaean](#) name *Coleus amboinicus* was published by [João de Loureiro](#) (1717–1791) who had encountered the plants in [Cochinchina](#) and parts of India.

Key words: *Coleus amboinicus* Wall. ex Benth., Morphology, Juvenile, Taxonomy.

1. Introduction:

A weed is a plant growing where it is not desired. So long as a plant is growing at a place and time without interfering with man's interest, it is not looked upon as a weed. In other words, while all weeds are unwanted plants, all unwanted plants may not be weeds. In this sense it is very important that plants listed as weeds are qualified by the situation in which they adversely affect man's affairs. This situation may be a crop field, roadside, railway tracks, air field, water bodies, woodland, garden, orchard etc. Besides very harmful effects in crop fields etc., weeds have many useful aspects also. For instance, fruits and rhizomes of certain weeds are used as vegetables, food material and medicines. *Coleus amboinicus* Wall. ex Benth. is an evergreen perennial growing to 0.2 m. The flowers are hermaphrodite and are pollinated by insects. It is a low herb with soft covered hair with erect, ascending stem. *Ajuga* is a genus of about 40- 50 species of annual and perennial herbs. It flowered from March to December and distributed from E. Asia, E.

Afghanistan, Pakistan, Kashmir, Himalayas to Bhutan, Burma, Nepal, China, Malaysia. It is useful in the treatment of agues. The juice of the root is used in the treatment of diarrhoea and dysentery. The leaves are used in the treatment of fever as a substitute for quinine.

The knowledge of seedling morphology can be beneficial in management and eradication of this weed before flowering and fruiting stages. Keeping these facts in mind an attempt has been made to explain the morphology of seedlings of *Coleus amboinicus* Wall. ex Benth.

Material and Methods:

The mature and ripen seeds were collected from natural habitat in Saharanpur forest division (U. P.) and dried in the sun for one week. Morphological observations have been made with the help of hand- lens, dissecting and compound microscope. For correct identification, seedlings were collected from natural habitat and were compared and identified with the help of seedling raised from identified seeds. For the morphological observations of seedling, seeds were sown in the garden soil at a depth of 0.5 cm. Seedlings started protruding above the soil on 8th day. The seedlings took another 54 days (Table 1) to reach the 5th true leaf stage. In the present study morphological features the seedlings has been described according to the terminology proposed by Burger (1972), Hickey (1973) and Vogel (1980). Besides these deeds on seedling morphology, several other authors like Troup (1921), Sampath (1982), Canne (1983), Augustine (2004a, b), Das and Paria (2008) and Singh et al (2008a, b, c) have been followed in this study. Day and date of appearance of leaves up to 5th true leaf stage were also recorded. Observations have been made on three seedlings.

Observations:

3. *Coleus amboinicus* Lour.

Coleus amboinicus Lour. (Plectranthus L' Herit.,) Strip. Nov. 84 Verso. 1788.- nom. Conserve.; codd, plectranthus and allied genera in southern Africa , in Bothalia 11: 371- 374. 1975; Keng in van Steenis, fl. Males. 8, 3: 382. 1978.

Vernacular name: Patharchur

Common name: Indian borage

Life form: Herb

Type of fruit: Nutlet

Seed: Blackish- brown, orbicular- lenticular, 0.10×0.10 cm, bifaced; both faces similar and convex, surface glabrous and glaucous, base truncate, rounded, apex obtuse, margins entire. Hilum distinct, whitish- brown, orbicular- ellipsoidal and raised.

Seedlings: Epigeal. Seed coat persistent up to seed leaf (paracotyledon) stage. Primary root non-fibrous, branched, white-opaque, smooth, teret; secondaries many, fine, non-fibrous. Root length 6.4 cm at paracotyledon stage; 7.0 cm at first true leaf stage; 7.5 cm at second true leaf stage; 8.0 cm at third true leaf stage; 8.7 cm at fourth true leaf stage; 9.4 cm at fifth true leaf stage. *Collet distinct white-opaque, squarish, smooth, without ring.* Hypocotyl green- purple, slightly curved, smooth, angular. Hypocotyl length 3.7 cm at paracotyledon stage; 4.2 cm at first true leaf stage; 4.5 cm at second true leaf stage; 4.9 cm at third true leaf stage; 5.4 cm at fourth true leaf stage; 6.1 cm at fifth true leaf stage.

Paracotyledons 2, phanerocotylar, isocotylar, opposite, exstipulate, leafy, petiolate, persist up to first true leaf stage.

Petiole green, smooth, angular, 0.4 cm long. Blade ovate, 1.3 × 0.6 cm, broad base, apex acute, entire, adaxial surface dark green but abaxial surface light green; smooth, reticulate venation.

Epicotyl white- purple, smooth, solid, long, angular. Epicotyl length 2.1 cm at first true leaf stage; 2.4 cm at second true leaf stage, 2.7 cm at third true leaf stage, 3.0 cm at fourth true leaf stage, 3.3 cm at fifth true leaf stage. Length of internodes 1.0 cm in all true leaf stages.

First true leaves simple, exstipulate, petiolate, opposite decussate. Petiole purple- green, glabrous, squarish, 0.5 cm long. Blade, ovate, 4.0 x 2.0 cm, margin serrate, apex acute, adaxial surface dark green; hairy, abaxial surface light green, smooth. Multicostate reticulate venation. Other features of subsequent true leaves are same as first true leaf (**Table 2**).

Total Observation period: 54 days (**Table 1**)

Flowering period: June- January.

Distribution: India, Pakistan, Sri Lanka.

Uses: The leaves are strongly flavoured and made an excellent addition to stuffings to meat and poultry. The leaves had many traditional medicinal uses, especially for the treatment of coughs, sore throats and nasal congestion. It cultivated as ornamentals and for its essential oils.

Coleus amboinicus Lour.

Table 1: Day and date of appearance of different leaves.

S. No.	Appearance of different leaves	Day	Date
1.	Seed leaf	10 th day	25.09.2025
2.	1 st true leaf	21 st day	06.10.2025
3.	2 nd true leaf	29 th day	14.10.2025
4.	3 rd true leaf	37 th day	22.10.2025
5.	4 th true leaf	44 th day	29.10.2025
6.	5 th true leaf	54 th day	08.11.2025

Coleus amboinicus Lour.

Table 2: Length of different parameters at different leaf stages of seedlings.

S. No.	Different leaf stages	Primary & secondary root (cm)	Hypocotyl (cm)	Epicotyl (cm)	Internode (cm)
Variant-1					
1.	Length at paracotyledon stage	6.5	3.8	-	-
2.	Length at first true leaf stage	7.1	4.2	2.2	-
3.	Length at second true leaf stage	7.5	4.6	2.5	1.0
4.	Length at third true leaf stage	8.0	5.0	2.8	1.0
5.	Length at fourth true leaf stage	8.9	5.7	3.0	1.0
6.	Length at fifth true leaf stage	9.5	6.3	3.6	1.0
Variant-2					
1.	Length at paracotyledon stage	6.4	3.7	-	-
2.	Length at first true leaf stage	6.9	4.2	2.0	-
3.	Length at second true leaf stage	7.4	4.5	2.4	1.0
4.	Length at third true leaf stage	7.9	4.9	2.7	1.0
5.	Length at fourth true leaf stage	8.5	5.1	3.0	1.0
6.	Length at fifth true leaf stage	9.3	5.8	3.2	1.0
Variant-3					
1.	Length at paracotyledon stage	6.5	3.7	-	-
2.	Length at first true leaf stage	7.2	4.3	2.2	-
3.	Length at second true leaf stage	7.6	4.6	2.5	1.0
4.	Length at third true leaf stage	8.2	4.9	2.8	1.0
5.	Length at fourth true leaf stage	8.9	5.5	3.1	1.0
6.	Length at fifth true leaf stage	9.4	6.2	3.3	1.0

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