

INTRASPECIFIC VARIATIONS IN FLORAL MORPHOLOGY OF *LUISIA TRICHORRHIZA* (W. J. HOOK.) BL. FROM FOOT-HILLS OF EASTERN HIMALAYA, IN WEST BENGAL, INDIA

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Abstract

Luisia trichorrhiza (W. J. Hook.) Bl., was observed to exhibit intraspecific colour variations in its natural populations of West Bengal. Variations were observed in floral part such as sepals, petals, and lip. The normal floral colour was yellowish green with purple lip. The plant that showed variations was observed with flowers having purple blotch on pale yellow lip. All other floral parts were more or less equal in size but pedicellate ovary was larger in size. The local availability status of this species is common and the status of variant species is rare. Its natural populations in the nature have drastically reduced as compared to earlier times when these plants were abundantly available in Terai and Dooars (foot hills of Himalayas) region of West Bengal. The factors including urbanization, construction of roads and dams etc. seem to be the major cause of habitat destruction of the species, in the region. Hence, conservation strategies need to be developed so as to save the species, in its natural habitats.

Introduction

THE GENUS *Luisia* Gaud. consists of about more than 40 species in the world (Gogoi, 2017) and 18 species were recorded in India (Chowlu, 2022). It has been recorded from Assam, Meghalaya, Nagaland, Arunachal Pradesh, Sikkim, West Bengal, Uttarakhand, Andhra Pradesh, Odisha, Maharashtra, Tamilnadu, Chattishgarh, and Jharkhand. The altitudinal habitat range of *Luisia trichorrhiza* is 500-1000 m amsl in India (Misra, 2019). *Luisia trichorrhiza* is an evergreen, slender epiphytic orchid. Stem short, erect, terete, and branched. Leaves terete and stout. Flowers during March-May.

Material and Methods

While working on epiphytic orchids in Terai region (foot-hills of Himalayas) of West Bengal, the author came across an interesting specimen of an epiphytic orchid. After critical examination and comparison with other authenticated specimens and literature (Chowdhery, 1998; Chowlu, 2022; Deva and Naithani, 1986; Gogoi, 2017; King and Pantling, 1898; Misra, 2019; Pradhan, 1979; Rao, 2009; Singh *et al.*, 2019), the unknown specimen (specimen B) was identified as a colour variant of *Luisia trichorrhiza* (specimen A). Herbarium specimens were prepared by standard methods (Jain and Rao, 1977).

Taxonomic Enumeration

Luisia trichorrhiza (W. J. Hook.) Bl.

Plant epiphytic, herb and evergreen. *Stem* 27-45 cm long, branched, erect, terete, leafy sheathed. *Leaves*

8-17 cm long and 1.2-1.6 cm in diameter, terete, alternate, narrow apex, surface rough, dark green. *Root* long and branched, ash colour. *Inflorescence* leaf opposed, racemose, rachis 0.3-0.5 cm long and 0.2-0.3 cm in diameter, floral bract very short (0.1-0.2 cm long), brown, ovate, apex acute, 4-6 flowered. *Flower* 0.6-0.7 cm across, dorsal sepal and sepals light green, purple lip, *lip* 3-lobed, hypochile concave, epichile cordate, apex sub acute, column light green with light purple colour. *Pollinia* 2, round, yellow.

Flowering and Fruiting

March-May

Habit

Epiphytic

Distribution

India, Bhutan, Nepal, Bangladesh, Burma, Thailand, Cambodia, Vietnam, and China.

Status in West Bengal

Common

The detailed variations [between two specimens (Fig. 1. Specimen A; Fig. 2. Specimen B)] in characters such as plant height, stem height, leaf size, inflorescence, and flowers of *Luisia trichorrhiza* are presented in Table 1. It was observed that there were minor variations in plant height, stem height, leaf size, and colour. Significant variations were noted in flower characters in both the specimens (Figs. 1-2). The flower colour of

specimen A was light green with purple lip, whereas in specimen B, the colour of flowers was light green with

species were more or less same in size in both the specimens A and B (Table 1). Such variations in other

Table 1. Comparative morphology of normal (A) and variant (B) species of *Luisia trichorrhiza*.

Characters	Specimen A	Specimen B
Plant height	30-50 cm	21 cm
Stem height	29-45 cm	14 cm
Leaf size	8-17 cm long, 0.2-0.3 cm thick	11 cm
Inflorescence	1-3, rachis 0.3-0.5 cm long and 0.2-0.3 cm in diameter, 4-6 flowers	1, 0.4 cm long and 0.2 cm in diameter, 4 flowers
Flower	Yellowish green with purple lip, 0.6-0.7 cm across	Pale yellowish green with purple blotch on pale yellow lip, 0.7 cm across
Dorsal sepal	0.3-0.4 cm × 0.3 cm, pale yellowish green	0.4 cm × 0.2 cm, pale yellowish green
Lateral sepals	0.5-0.6 cm × 0.2 cm, pale yellowish green	0.4 cm × 0.2 cm, pale yellowish green
Lateral petals	0.6 cm × 0.2 cm, pale yellowish green	0.5 cm × 0.2 cm, pale yellowish green
Lip/ Labellum	0.8 cm × 0.6-0.7 cm, purple, back side is light green with pale purple colour margin, purple lip, lip 3-lobed, hypochile concave, epichile cordate, apex sub acute	0.8-0.9 cm × 0.8 cm, purple blotch on pale yellow, back side is pale yellow, lip 3-lobed, hypochile concave, epichile cordate, apex sub acute
Column	0.3 cm × 0.2 cm, purple with light green Anther cap 1.5-2.0 mm × 1.5-2.0 mm, off-white	0.4-0.5 cm × 0.2 cm, purple with light green Anther cap 1.5-2.0 mm × 1.5-2.0 mm, off-white
Pollinia	2, yellow, 0.2 cm across, round	2, yellow, 0.2 cm across, round
Ovary and pedicel	0.5-0.6 cm long, 0.2 cm in diameter, green with light purple base	0.8-1.0 cm long, 0.2 cm in diameter, green with light purple base

purple blotch on pale yellow lip. All floral parts *i.e.* dorsal sepal, lateral sepals, lateral petals, and lip of variant

orchid species have also been observed by Gogoi *et al.* (2012) from Assam and Roy (2021) from Darjeeling



Fig. 1. a-g. *Luisia trichorrhiza* (Specimen A): a, Plant; b, Inflorescence; c, Front view of lip; d, Back view of lip; e, Column; f, Anther cap; g, Pollinia.



Fig. 2. a-g. Intraspecific variations of *Luisia trichorrhiza* (Specimen B): a, Plant; b, Inflorescence; c, Front view of lip; d, Back view of lip; e, Column; f, Anther cap; g, Pollinia.

foot-hills Himalayan region of India.

The species was found at an altitudinal range 150-1000 m amsl; it is widely distributed throughout Asia. Locally, it was widely available mostly on tree trunks and branches of phorophytes. The local availability status of this species is common and the status of variant species is rare. Its natural populations in the nature have drastically reduced as compared to earlier times when these plants were abundantly available in Terai and Dooars (foot hills of Himalayas) region of West Bengal. The factors including urbanization, construction of roads and dams *etc.* seem to be the major cause of its habitat destruction, in the region. Hence, conservation strategies need to be developed so as to save the species, in its natural habitats.

Conclusion

During the present investigation, variations were observed in the floral morphology of *Luisia trichorrhiza*. The present status of the species with variations was rare while the type species was common throughout the district, in the altitudinal range upto 150-1000 m amsl. Presently, though gross variations were not observed in the species, these were found in just colour, shape and texture of flowers. Additionally, it was also observed that stem was short, lateral petals were slightly smaller and wider, lip was slightly more in length, and pedicellate ovary was longer in the presently investigated species. The column with anther cap was

not much covered by the floral part (*i.e.* sepals and petals), lateral petals were little longer than sepals and more or less equal in width. Therefore, the present specimen with variations is not a sub species, variety or form; the variations observed are infact, intraspecific variations observed in flower colour and morphology of of *Luisia trichorrhiza*.

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