

## Taxonomic note on *Luisia zeylanica* (Orchidaceae) from Bonai Forest Division, Odisha, India

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### Abstract

*Luisia zeylanica* has been found in the forest division of Bonai, state of Odisha, India. We found significant morphological variations between the observed specimens and the data found on this plant in the literature. A detailed description and photographs to facilitate identification of the plant in the field are provided. A geographical distribution map is also proposed.

### Résumé

*Luisia zeylanica* est une orchidée trouvée dans la division forestière de Bonai, état d'Odisha, en Inde. Nous avons trouvé des variations morphologiques importantes entre les spécimens observés et les données trouvées sur cette plante dans la littérature. Une description détaillée et des photographies sont fournies pour faciliter l'identification de la plante sur le terrain. Une carte de répartition géographique est également proposée.

**Keywords:** Epiphyte, Odisha, morphological variations, taxonomy

**Mots clés :** Epiphyte, Odisha, variations morphologiques, taxinomie

## Introduction

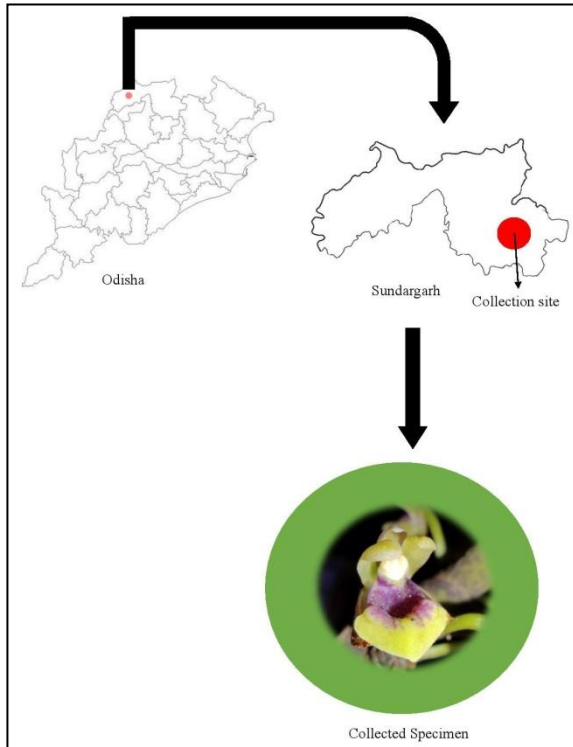
The genus *Luisia* Gaudichaud (1829: 426) shows low morphological variations among the different species (Seidenfaden, 1971; Misra, 2010; Khuraijam & Roy, 2015; Gogoi, 2016). The 41 species of the genus are distributed in Australia, Bhutan, China, Fiji, India, Indonesia, Japan, Korea, Malaysia, New Guinea, Philippines, Sri Lanka and Thailand (Chen *et al.*, 2009; Gogoi, 2016; Mishra *et al.*, 2020; Kumar *et al.*, 2021). In India, about 19 species are present. They are mainly found in the Northeastern region, Peninsular India and Andaman & Nicobar Islands (Vij & Verma, 2005; Gogoi, 2016; Mishra *et al.*, 2020). Five species are reported from Odisha state (Haines, 1924; Saxena & Brahmam, 1995; Misra, 2007; Kumar *et al.*, 2021). In the work on Community level discussion, for biodiversity management in Barsuan range of Bonai Forest Division, Sundergarh district, Odisha, India we have observed about 50-60 plants distributed on a area of 1.5 km<sup>2</sup> (Figure 1). It was also observed that the specimen grows on *Shorea robusta* Gaertner (1805: 48). After the critical examination of collected specimen from Sarkunda Reserve Forest of Bonai Forest Division and comparison with descriptions found in the literature (Lindley, 1853; Vij & Verma, 2005; Gogoi, 2016; Mishra *et al.*, 2020) and the support of specialists of the Royal Botanical Gardens, Kew the plant was determined as a possible representative of *Luisia zeylanica* with significant morphological variations which are not proposed in earlier literature. The present study also underlines the importance of a molecular approach which could help to determine if it could be a new species or variety of *Luisia zeylanica*. A specimen was deposited in APRFH.

## Taxonomic treatment

*Luisia zeylanica* Lindley, *Folia Orchidacea Luisia* 3 (1853); Seidenfaden, *Dansk Botanisk Arkiv* 27(4): 62 (1971); Deva & Naithani, *Orchid Flora of North West Himalaya* 413 (1986); Misra, *Orchid of Orissa* 665 (2004); *L. teretifolia* auct. non Gaudichaud BP, (1826); Hooker J.D, *Flora of British India* 6: 22 (1890); King & Pantling, *Annals of the Royal Botanic Garden, Calcutta* 8: 202. t. 271 (1898); Duthie, *Annals of the Royal Botanic Garden, Calcutta* 9: 140 (1906).

Type: Sri Lanka, *Macrae* 50 (K000873793!).

Material studied: INDIA, Odisha, Bonai Forest Division, 21° 85' 53.84" N; 85° 16' 95.62" E; 628 m alt., 12th-13th April 2021, S. Kumar N. & S. Kumar 051 (APRFH).



**Figure 1: Geographical location of collected species**

Description (Figure 2): Epiphyte herb, 22-30 cm tall. Stem woody, unbranched, 0.4-0.5 cm thick, terete, sheathed. Sheath 1.0-1.3 cm long. Roots non-woody, unbranched, brown, up to 64 cm long and 0.3 cm thick. Leaves 16.5-18.5 cm long and 0.3-0.5 cm thick, fleshy, green with brownish mosaic, terete, acute at apex. Raceme with 12-16 flowers, arising from the leaf sheath, opposite to the leaf, short, 1.5 cm long. Floral bracts minute, oblong-obtuse. Petiole  $6.9 \times 1.0$  mm. Flowers  $8.1 \times 9.2$  mm across, triangular in shape. Sepals not equal in size and greenish in colour with light brown stripe. Dorsal sepal  $5.0 \times 2.0$  mm, greenish with brown dotted structure, oblong-ovate, obtuse, tip blunt. Lateral sepals  $6.0 \times 2.5$  mm, green with a median brownish stripe, elliptical at the base, obliquely ovate-lanceolate, acute, curved inward in the middle which gives it a boat shape. Petals

slightly transparent, greenish, light brown at base, light brown stripe in the middle,  $6.1 \times 2.1$  mm, oblong, subacute. Lip yellowish green washed with purple towards the base, yellowish at the apex, 5 mm long in total, 6 mm wide when spread, 3-lobed; hypochile triangular,  $3.0 \times 2.6$  mm, concave; epichile rhombic, fleshy, convex. Pollinia 2, orange-yellow,  $0.5 \times 0.6$  mm, rounded, stipe 0.5 mm. Anther cap,  $2.5 \times 2.0$  mm. Viscidium green,  $0.5 \times 1.3$  mm. ovary green with a purple stripe,  $3.3 \times 2.0$  mm.

Flowering time: March-April

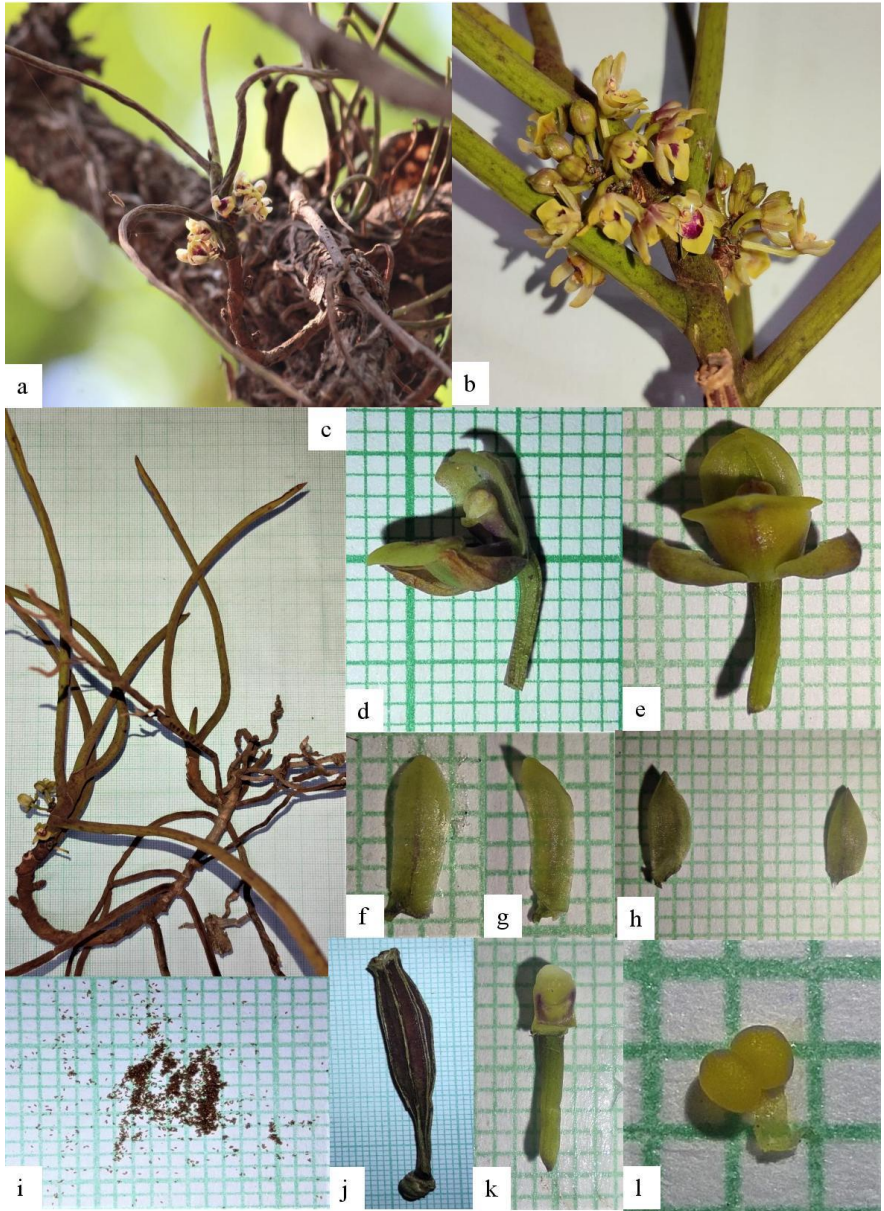
Habitat: Observed on trunk of *Shorea robusta* only in moist deciduous forest.

Note: The observed specimens in Bonai Forest Division have leaves 3.0-5.0 mm thick (*versus* 3.0-4.0 mm), fleshy, green with brownish mosaic structure (*versus* green with purple spots), a greater number of flowers on the raceme (12-16 *versus* 1-6 flowers). A narrow lip (*versus* broad lip), devoid of horizontal stripe and colour on epichile and hypochile. A dorsal sepal sometimes overlapping the petals (*versus* open and not overlapping the petals), oblong (*versus* oblong-ovate), the petals narrowly oblong (*versus* linear oblong). A column smaller and narrower  $2.0-2.2 \times 1.3-2.0$  mm (*versus*  $3.5-2.5 \times 1.5-2.5$  mm), an anther smaller,  $1.0 \times 1.2$  mm (*versus*  $1.8 \times 1.9$  mm) and much smaller pollinia,  $0.5 \times 0.6$  mm (*versus*  $1.5 \times 1.5$  mm).

Conclusion: Genetic studies on the specimen collected and those observed in nature could strengthen our current hypothesis and show that the specimens present in the forest division of Bonai, taking into account the significant morphological variations observed in comparison with the data found in the literature, would be representatives of a new species or variety of *Luisia zeylanica*.

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**Figure 2: *Luisia zeylanica***

a: habitat; b: flowers; c: leaves; d-e: flower; f: dorsal sepal; g: petals; h: lateral sepals; i: seeds; j: fruit; k: column; l: pollinia

## References

- Chen, X., Z. Liu, G. Zhu, K. Lang, Z. Ji, Y. Luo, X. Jin, P.J. Cribb, J.J. Wood, S.W. Gale, P. Ormerod, J.J. Vermeulen, H.P. Wood, D. Clayton & A. Bell, 2009. *Orchidaceae*, in Z. Wu, P.H. Raven & D. Hong (eds), *Flora of China*, 25. Science Press, Beijing; Missouri Botanical Garden Press, St. Louis, USA.
- Gaertner, J., 1805. *SHOREA* Roxb. *Supplementum Carpologiae* 48.
- Gaudichaud, B. C., 1829. *Luisia* in M.L. Frecinet, *Voyage autour du Monde...* 426.
- Gogoi, K., 2016. *Luisia trichorrhiza* var. *flava* (Orchidaceae): a new variety from Assam, India. *Richardiana* 16: 322-326.
- Haines, H.H., 1924. *The Botany of Bihar and Orissa*. Adlard & Sons, London. 1150-1182.
- Khuraijam, J.S. & R.K. Roy, 2015. A new species of *Luisia* Gaud. (Orchidaceae) from northwestern Bihar, India. *Biodiversity Journal* 6(3): 699–702.
- Kumar, S., S. Mishra & A.K. Mishra, 2021. Diversity of orchid species of Odisha state, India. With note on the medicinal and economic uses. *Richardiana* n.s. 5: 1-26.
- Lindley, J., 1853. *Folia Orchidacea. Luisia* 3.
- Mishra, S., J.S. Jalal, V.C. Paulose & L.J. Singh, 2020. Two new species of *Luisia* (Vandeeae, Orchidaceae) from the Andaman and Nicobar, India. *Phytotaxa* 453(3): 255-264.
- Misra, S., 2007. *Orchids of India: a glimpse*. Bishen Mahendra Pal Singh, Dehradun. 424 p.
- Misra, S., 2010. A new species of *Luisia* Gaud. (Orchidaceae) from Andaman and Nicobar Islands, India. *Nelumbo* 52: 152-155.
- Saxena, H.O. & M. Brahmam, 1995. *The flora of Orissa*. Orissa Forest Development Corporation & RRL, Bhubaneswar. 2918 p.
- Seidenfaden, G.S., 1971. Notes on the genus *Luisia*. *Dansk Botanisk Arkiv* 27: 1-101.
- Vij, S.P. & J. Verma, 2005. *Luisia zeylanica* Lindl. (Orchidaceae): a new record for Himachal Pradesh. *Rheedea* 15(2): 138-139.