

A new species of *Luisia* (Orchidaceae) from Shan State, Myanmar

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ABSTRACT. A new species, *Luisia verrucosa* Kurzweil, Nob. Tanaka & Ormerod, from Shan State in Myanmar is described and illustrated. It is very distinct in the genus, characterised by (1) light pinkish and purple-marked navicular sepals which are coarsely verrucose on the outside, especially in their distal part, (2) light pinkish and irregularly pink-dotted lorae-elliptic petals with yellow tips, and (3) a lip with a comparatively large, oblong-elliptic, maroon-purple epichile with prominent callosities in the form of massive bulges. Because its lip does not have a constriction or prominent boundary line between hypochile and epichile, it is superficially similar to *Luisia brachystachys* (Lindl.) Blume, but the new species differs by having considerably larger flowers with verrucose sepals and pronounced lip ornaments.

Keywords. *Luisia verrucosa*, taxonomy, tribe Vandeeae

Introduction

Luisia Gaudich. is a relatively small genus in the tribe Vandeeae of the family Orchidaceae, comprising c. 47 epiphytic or lithophytic species which are widely distributed in tropical and subtropical Asia and the western Pacific Ocean, ranging from Sri Lanka and India to southwestern and southeastern China, Taiwan and southern Japan, and throughout Malesia eastwards to New Guinea, the Solomon Islands, the Bismarck Archipelago, northern Australia, New Caledonia, Vanuatu, Fiji, Samoa and the Mariana Islands (Pridgeon et al., 2014; Govaerts et al., 2022). The genus is characterised by elongate stems with scattered or apically crowded terete leaves, short racemose inflorescences of one to few flowers, an unspurred lip that is mostly clearly divided into hypochile and epichile by a constriction and/or a distinct boundary line, the lack of a prominent column-foot and porate pollinia (Pridgeon et al., 2014). The small or medium-sized flowers have often greenish, yellowish or pinkish-white sepals and petals, and a maroon-purple lip with various callosities in the shape of bulges or rounded keels.

Luisia is considered to be one of the taxonomically difficult orchid genera in tropical Asia. As already pointed out by Seidenfaden (1971: 11), hardly any taxonomically valuable characters can be found in the general habit and the vegetative part of the plants. Taxonomists therefore have to rely mainly on the structure of the flowers which is also problematic as the floral parts are rather variable within a species. Taxonomic accounts of *Luisia* species in mainland Asia have been provided in a number of recent treatments, such as *Orchid Genera in Thailand* (Seidenfaden, 1988), *Orchids of Bhutan* (Pearce & Cribb, 2002), and *Flora of China* (Chen & Wood, 2009). They utilise characters like petal width, lip shape, prominent boundary line between lip hypochile and epichile, and carinate midvein of the lateral sepals. In addition, several new *Luisia* species have been proposed in the region since then (*L. balakrishnanii* S.Misra, *L. diglipurensis* Sanjay Mishra & Jalal, *L. jarawana* Sanjay Mishra & Jalal, *L. lui* T.C.Hsu & S.W.Chung, *L. megamalaiana* Karupp. & V.Ravich., *L. parviflora* Aver. and *L. simaoensis* D.P.Ye & H.Jiang). The discovery of the recently described species *Luisia yunnanensis* Jie Huang & D.H.Peng is based on a detailed study of morphological and molecular characters (Huang et al., 2020), including phylogenetic trees indicating its evolutionary relationships. More extensive use of molecular characters to help clarify the phylogenetic relationships in *Luisia* is needed.

Thirteen *Luisia* species have so far been identified in Myanmar (Ormerod et al., 2021), but unsurprisingly it is widely believed that several other species are still awaiting discovery given our poor state of knowledge of Myanmar's biodiversity (Aung et al., 2020). During a previous comprehensive study of the genus *Luisia*, three specimens from Myanmar could not be identified and appear to belong to as yet undescribed species (Seidenfaden, 1971: 90–91). Because of the incomplete material, they could not be described as new at the time. However, according to the illustrations that were provided by Seidenfaden, none of these resemble our new species as described below.

During a field trip to Pindaya, Taunggyi District, central Myanmar, a hitherto undescribed species of the genus *Luisia* was collected. The second author took living plant material to the Forest Research Institute, Yezin, Nay Pyi Taw. Based on careful morphological investigations of dried herbarium specimens, spirit-preserved specimens, and living material cultivated in the nursery of the Forest Research Institute, we here describe this plant as a new species, *Luisia verrucosa*. The flowers of the new species differ from all others in the genus by their prominently verrucose navicular sepals, the lorate-elliptic petals with yellow tips, the lip which lacks a constriction or an obvious boundary line between hypochile and epichile, and the large oblong-elliptic maroon-purple lip epichile with prominent callosities.

Taxonomic treatment

***Luisia verrucosa* Kurzweil, Nob.Tanaka & Ormerod, sp. nov.**

Morphologically close to *Luisia brachystachys* (Lindl.) Blume in petal shape and the lack of a pronounced distinction between epichile and hypochile, but the new species differs by having considerably larger flowers, verrucose sepals and in the lip callus.

– TYPE: Myanmar, Shan State, Taunggyi District, Pindaya Township, Pindaya, Nan Kone village, 20°47.953'N 96°42.080'E, c. 1400 m, 15 June 2019, *N. Tanaka MY5052* (holotype TNS [TNS01322556]; isotype RAF). (Fig. 1, 2)

Monopodial epiphytic herbs, entirely glabrous. **Stems** pendulous, rigid, unbranched, c. 40 cm tall, 0.4–0.5 cm diam., internodes 1.9–3.1 cm long, covered by persistent leaf sheaths, green and sometimes with reddish or brownish tinge. **Roots** c. 3 mm thick, vermiform, reddish purple. **Leaves** 7–8, slender, secund, scattered all along stem, 1.9–3.1 cm apart, terete, 16–18 × 0.1–0.2 cm, apex acute, base as a sheath covering internode. **Inflorescences** lateral, arising from stem nodes and penetrating leaf sheath, c. 1.1 cm long, with no obvious peduncle, raceme c. 9-flowered, with 1 or 2 flower(s) opening at a time; floral bracts rounded-triangular, 2–3 × 2.5–3.5 mm, strongly verrucose on outside, apex obtuse or subacute. **Flowers** c. 1.4 × 1.5 cm across, resupinate; sepals light pinkish with reddish purple or purple-maroon margins; petals transparent white with purplish tinge, middle portion with irregular faint purplish red dots on inside and outside, apical quarter or third of petals yellow; lip dominated by purple-maroon epichile, hypochile plus part of side lobes and marginal areas of lip epichile whitish, apical part of epichile pale yellow with reddish purple dots. **Pedicel and ovary** indistinguishable, together c. 1.3 cm long. **Sepals** free, deeply navicular (possibly partly as a consequence of senescing), on outside coarsely verrucose, particularly in the distal portion with longitudinally arranged bumps and bulges, which are semi-globose or elongate. Median sepal erect, elliptic-lanceolate, c. 11 × 7 mm, 5-veined, apex retuse. Lateral sepals similar but deeper navicular, spreading, c. 11.5 × 5.7 mm, 7-veined, apex not carinate, mucronate. **Petals** narrowly lorate-elliptic, c. 11.5 × 3 mm, 5-veined, surface smooth, apex obtuse. **Lip** c. 9 × 5 mm, longitudinally divided into short hypochile and large epichile, without constriction or prominent boundary line between them; hypochile inconspicuous, with small, rounded side lobes, hypochile 3–4 × 5–6 mm; epichile broadly oblong-elliptic, 5–6 × 5–6 mm, with prominent callosities that are developed as irregular massive bulges, one median bulge much taller than the others, epichile apex emarginate; lip underside altogether smooth. **Column** c. 3.4 mm long, stout, white, anther cap white with two dark purple markings, pollinia two, yellow.

Distribution. Only known from the type collection from Taunggyi District, Shan State, Myanmar.

Ecology. *Luisia verrucosa* was found growing on a limestone hill in evergreen forest at c. 1400 m.

Etymology. The specific epithet refers to the prominently verrucose sepals.

Provisional IUCN conservation assessment. The new species is currently only known from the type collection, and the distribution as well as the number and size of populations cannot be determined. The species is therefore assessed as Data Deficient



Fig. 1. *Luisia verrucosa* Kurzweil, Nob.Tanaka & Ormerod. **A.** Habit. **B.** Front view of flower. **C.** Diagonal front view of a flower showing the lip hypochile with small side lobes and the apical part of the epichile. (Photos: N. Tanaka)

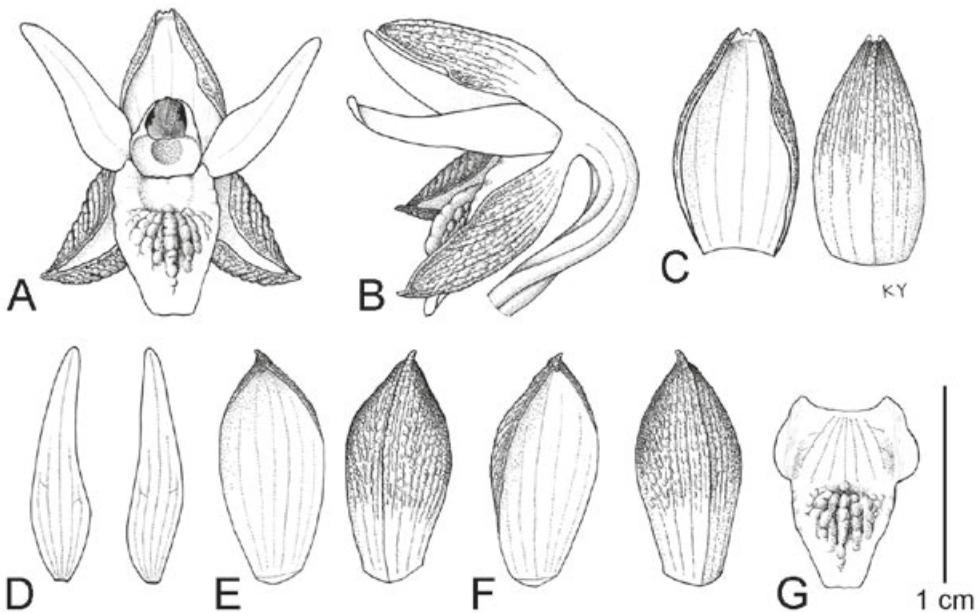


Fig. 2. Flower of *Luisia verrucosa* Kurzweil, Nob.Tanaka & Ormerod. **A.** Front view. **B.** Side view. **C.** Adaxial (left) and abaxial side (right) of median sepal. **D.** Petals. **E.,F.** Adaxial (left) and abaxial side (right) of lateral sepals. **G.** Lip. Drawn by Kaoru Yoneda.

(DD) according to the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Committee, 2022). The forest is conserved by the monastery of Nan Kone village.

Notes. The new species is very distinct in the genus and morphologically unlike any other as pointed out above. When following the treatment in Seidenfaden (1988), the specimen *Tanaka MY5052* (type of the new species) keys out directly to *Luisia brachystachys*, with which it shares the lack of a pronounced distinction of lip hypochile and epichile (no prominent boundary line; epichile not suddenly widened above hypochile). However, this species differs by having much smaller flowers with sepal lengths of 4–5 mm (vs 11–11.5 mm in the new species). Further differences between the two species are the distal sepal portions (*L. brachystachys*: smooth, carinate; new species: prominently verrucose, not carinate) and the lip callosities (*L. brachystachys*: none; new species: prominent bulges). As indicated by Seidenfaden (1988) and Chen & Wood (2009), a clear division of their lip into hypochile and epichile by a prominent constriction and/or boundary line is also absent in *L. zollingeri* Rchb.f., but this species has broadly ovate-elliptic petals (vs narrowly lorate-elliptic in the new species), and also differs in its much smaller flowers (sepal lengths of 4–6 mm), smooth sepal outsides, and the absence of lip epichile callosities.

ACKNOWLEDGEMENTS. We are grateful to the Myanmar Forest Department, Ministry of Natural Resources and Environmental Conservation, for their permission to carry out fieldwork in reserved forests and for their support and collaboration. Our sincere thanks are due to Aung Khaing Win for his help during the fieldwork, and Kaoru Yoneda for preparing the line drawing. This study was partially carried out by the international cooperative project ‘The Natural History Research of Myanmar and the Foundation of an International Research Center’ initiated by the National Museum of Nature and Science, Japan based on a memorandum of understanding (MoU) with the Forest Department, Ministry of Natural Resources and Environmental Conservation, Myanmar. This study was also partially supported by JSPS KAKENHI (18KK0210) to N. Tanaka.

References

- Aung, Y.L., Mu, A.T., Aung, M.H., Liu, Q. & Jin, X.H. (2020). An annotated checklist of Myanmar orchid flora. *PhytoKeys* 138: 49–112.
- Chen, S.C. & Wood, J.J. (2009). *Luisia*. In: Chen, S.C., Liu, Z.J., Zhu, G.H., Lang, K.Y., Tsi, Z.H., Luo, Y.B., Jin, X.H., Cribb, P.J., Wood, J.J., Gale, S.W. et al. (ed.) *Flora of China*, vol. 25 (Orchidaceae), pp. 488–490. Beijing: Science Press; St. Louis: Missouri Botanical Garden Press.
- Govaerts, R., Bernet, P., Kratochvil, K., Gerlach, G., Carr, G., Alrich, P., Pridgeon, A.M., Pfahl, J., Campacci, M.A., Holland Baptista, D. et al. (2022). *World Checklist of Orchidaceae*. Facilitated by the Royal Botanic Gardens, Kew. <http://wcsp.science.kew.org>. Accessed 15 Mar. 2022.

- Huang, J., Yu, Y.Y., Chen, G.Z., Liao, X.Y., Liu, Z.J. & Peng, D.H. (2020). *Luisia yunnanensis* (Orchidaceae; Epidendroideae), a new species from China: Evidence from morphology and DNA analyses. *Phytotaxa* 475: 52–58.
- IUCN Standards and Petitions Committee (2022). *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 15.1. Prepared by the Standards and Petitions Committee. Available from <http://iucnredlist.org/resources/redlistguidelines>.
- Ormerod, P., Kurzweil, H. & Watthana, S. (2021). Annotated list of Orchidaceae for Myanmar. *Phytotaxa* 481: 1–262.
- Pearce, N.R. & Cribb, P.J. (2002). *The orchids of Bhutan*. In: Flora of Bhutan, vol. 3 (3). Royal Botanic Garden Edinburgh and Royal Government of Bhutan.
- Pridgeon, A.M., Cribb, P.J., Chase, M.W. & Rasmussen, F.N. (ed.) (2014). *Genera Orchidacearum*, vol. 6 (Epidendroideae, part 3). Oxford: Oxford University Press.
- Seidenfaden, G. (1971). Notes on the genus *Luisia*. *Dansk Bot. Ark.* 27(4): 1–101.
- Seidenfaden, G. (1988). Orchid genera in Thailand XIV. Fifty-nine vandoid genera. *Opera Bot.* 95: 1–398.