A New Species of *Habenaria* (Orchidaceae) from Southeast Asia

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Abstract

Habenaria anomaliflora H. Kurzweil & S. Chantanaorrapint, *sp. nov.* from Southeast Asia (Thailand and Laos) is described and illustrated.

Introduction

While revising the genus *Habenaria* Willd. for the Flora of Thailand the first author of this paper came across herbarium material of an unusual terrestrial orchid from Khao Yai National Park in central Thailand with small Liliaceae-like flowers. A subsequent search revealed that the same plant had been noted by Kerr (1969) in Laos and was later illustrated by Seidenfaden (1992: 70). A third collection, also in central Thailand, was made by the second and third authors of this paper. As the plant does not match any currently known species it is here described as new.

Habenaria anomaliflora H. Kurzweil & S. Chantanaorrapint, *sp. nov.*

Habenaria humistrata Rolfe ex Downie, *H. siamensis* Schltr., *H. porphyricola* Schltr. et *H. reniformis* (D.Don) Hook.f. affinis sed floribus omnino regularibus et ecalcaris differt. – **Typus:** Thailand, Nakhon Nayok Province, Khao Yai National Park, Mo Sing To Reservoir, ca. 700 m alt., 14°25'50''N, 101°21'50''E, 25 Sep 2005, *A. Buakhlai 158* (holo PSU!; iso BCU!, BKF!). **Fig. 1 & Plate 1.**

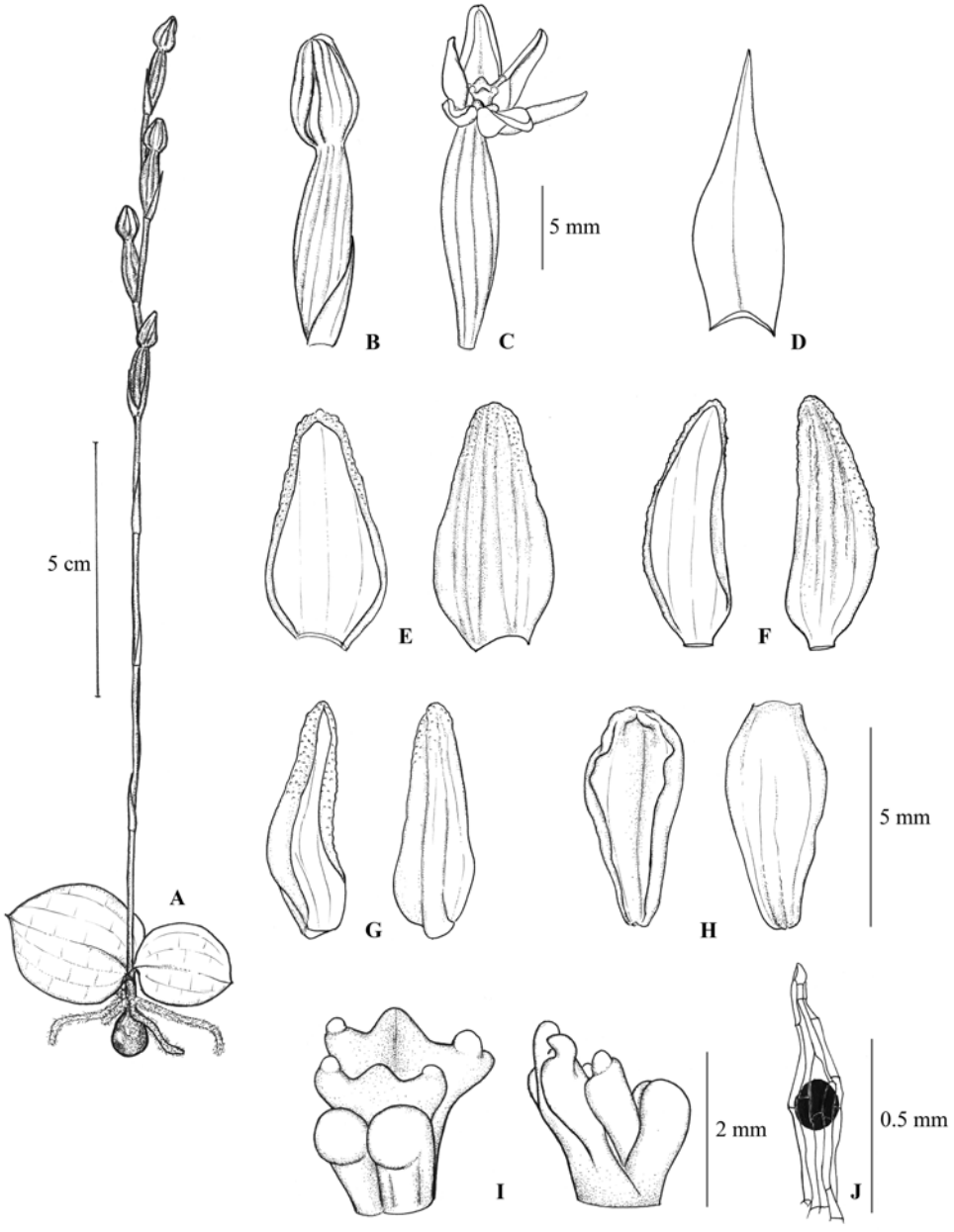

Figure 1. *Habenaria anomaliflora* H. Kurzweil & S. Chantanaorrapint. A. Habit; B, C. flower; D. Floral bract; E. Dorsal sepal; F. Lateral sepal; G. Petal; H. Lip; I. Column; J. Seed (all from *A. Buakhlai 158*). (Drawn by S.Chantanaorrapint).

Plate 1. *Habenaria anomaliflora* H. Kurzweil & S. Chantanaorrapint. A. Upper part of the inflorescence; B. Flower; C. Column. (all from *A. Buakhlai 158*). (Photos: S.Chantanaorrapint). [– Scale bars: A = 5 mm, B–C = 1 mm]

Terrestrial **herbs**, 16–25 cm tall, entirely glabrous. **Root tubers** ovoid, 1–1.2 × 0.6–0.8 cm, brown, with few fibrous roots. Basal sheathing leaves few, scale-like. **Foliage leaves** 2, radical, adpressed to the substrate, ovate-acute, shortly pointed, cordate at the base, the two leaves unequal in size, the larger one 2.5–4 × 2.4–3.8 cm, the smaller one 2–2.5 × 1.6–2 cm, length of the basal sheath 5.7–7 mm. Sterile bracts of the flowering stem 3–6, erect in their basal part and spreading above, narrowly lanceolate, acuminate, 9.4–12 × 3–4 mm, base shortly sheathing. **Inflorescences** terminal, lax, (1–)5- to 8-flowered; rachis 4–8.1 cm long and to 1 mm thick; floral bracts ovate-lanceolate, acuminate, 6.6–11 × 2.35–4 mm. **Flowers** in most plants not opening very widely, subactinomorphic with the six perianth lobes subequal, spurless, 4–6 mm in diameter; tepals green on the outside, inside of petals and lip white. Ovaries and pedicels 10–14.5 mm long, not twisted, suberect, borne close to the rachis, with pronounced ridges. All 6 tepals with entire margins, dorsal surface papillate above, ovate-lanceolate, widest just above the base, acute or subacute, with 3 or 5 pronounced dark veins developed as slight keels or ridges, with the edges and tips turned in. Dorsal sepal 5.6–7 × 2.2–5 mm, lateral sepals 5.5–6.5 × 2–3 mm. Petals 4.9–6.5 × 1.8–2.8 mm. Labellum 4.5–6.5 × 2–3.5 mm. Column short, dark green, 1.5–2 mm long and ca. 3 mm wide across the top. Anther erect, bright green with vertical white stripe in the middle, anther canals (?) stout and curving upwards, with white globules (? viscidia) on their tips; pollinia not seen. Rostellum similar to the anther in shape but smaller, green, 3-lobed with a short central lobe and two paler stout lateral lobes. Stigmas 2, apparently largely united, ca. 1 mm long, black-green, clavate-globular, slightly curved forwards. **Fruits** fusiform, 12–15 × 2.5–3 mm, with 6 smooth ridges. **Seeds** fusiform, testa made up of few longitudinally-elongate cells, ca. 0.73 mm long.

Distribution: Central Thailand and Laos. Apparently also found in Loei Province in Northeastern Thailand (P. Tripetch, pers. comm.).

Flowering period: August–October.

Ecology: The type specimen was collected on sandy soil in secondary forest near Mo Sing To Reservoir in Khao Yai National Park at ca 700 m altitude. According to the detailed collector's label of *Maxwell 00-351* the plants of this population were found in secondary, fire-damaged, evergreen scrubland over sandstone bedrock at an altitude of approximately 825 m. The specimens which were collected by A. D. Kerr (*Kerr 2681*) were found 'in a large population, in forest' (Seidenfaden, 1992).

Etymology: The name of this new species refers to the abnormal flowers.

Other specimens examined: CENTRAL THAILAND: Nakhon Nayok Province, Khao Yai National Park, 12 Aug 2000, *Maxwell 00-351*, p.p. (BKF!, CMU!, L!); excluding the specimen in the spirit collection at CMU, which is *Habenaria humistrata*; Khao Yai National Park, *Tripetch A03* (QBG [spirit], only photographs seen). LAOS: Ban Muong Noi, Vientiane Plains, flowering in Aug, *Kerr 2681*, (C! [flowers only], illustrated by Seidenfaden, 1992: 70).

Notes: The new species is similar in its habit to the three Thai endemics *Habenaria humistrata* Rolfe ex Downie, *H. siamensis* Schltr. and *H. porphyricola* Schltr., and the widespread *H. reniformis* (D.Don) Hook.f. (Himalaya to China and Sumatra), all of which are slender plants with (1–) 2–4 small, cordate foliage leaves adpressed to the substrate (Seidenfaden, 1977). However, the new species differs from all of these by its subactinomorphic perianth which lacks a lip spur.

In his treatment of the orchids of Indochina Seidenfaden (1992: 68–69) commented on the Laotian population and suggested that this plant is a *Habenaria*-like monstrosity which is supported here. L. Garay (pers. comm. to G. Seidenfaden) suggested that the Laotian specimen (*Kerr 2681*) may be a peloric form of *H. porphyricola* but no reasons for this suggestion were given (however, this would be unlikely as *H. porphyricola* is currently considered endemic to Thailand). Seidenfaden (1992) abstained from proposing a name but illustrated the plant. As four different collections of the plant are now know it is obvious that the abnormality is constant and apparently genetically fixed. Floral abnormalities are not unknown in the genus *Habenaria*. *H. dentata* (Sw.) Schltr., a widespread Asian species, has a tendency towards the formation of abnormal flowers (inner perianth lobes aborted in some flowers, spurs strongly reduced in some specimens), and the related *H. malintana* (Blanco) Merr. is consistently peloric (perianth subactinomorphic and spurless). Abnormal specimens in the genus *Habenaria* have also been reported in a number of tropical African species (Summerhayes, 1968).

Kerr (1969: 187) suggested that this species (though unnamed at the time) is close to *Habenaria malintana*, probably mainly on account of the subactinomorphic perianth.

Due to the similar habit the new species might possibly be an abnormal form of *Habenaria humistrata*, *H. siamensis*, *H. porphyricola* or *H. reniformis*. Particularly the fact that it was once found growing together in the same population with the former could suggest that it is

merely its peloric form (however, it is equally possible that it was growing in a mixed population). In an age with advanced techniques available to us where it is the standard procedure to obtain additional characters including ultrastructural and molecular ones we consider it premature to interpret two morphologically different taxa as mere forms of one another based on mere suspicion and speculation. As (1) this abnormality is constant, (2) there is currently no definitive evidence indicating that this abnormality is a form of a particular species, we feel it is justified to propose it as a new species.

Traditionally the main generic character of *Habenaria* is the column with its freely projecting stigmatic processes (Pridgeon *et al*., 2001). This character is not expressed in *H. anomaliflora* although this is also not surprising in a monstrosity. Therefore questions with regard to its generic position may arise. Currently the only argument supporting the inclusion of this species in *Habenaria* is the habit which is similar to what is found in *H. humistrata*, *H. siamensis*, *H. porphyricola* and *H. reniformis*, and it is hoped that future studies will address this problem. The fact that the column of this new *Habenaria* species is untypical in its genus is very much in contrast to *H. malintana* which has a 'normal' column with elongate and freely projecting stigmatic processes.

Also the homologisation and the organophyletic origin of the different parts of the strongly reduced column of the new species are unclear and should be studied in detail in the future. Based on studies of alcohol material by the second author we provisionally interpret the taller of the two 3-lobed structures as the anther with has 2 globular viscidia at the tips of the stout anther canals (although originally developed by the rostellum these suspected viscidia are distant from it at the flowering time). We further interpret the smaller of the three-lobed structures as the rostellum and the two bulges in front of it as the lateral stigma lobes (as seen by the position of the stigmatic channel). Developmental studies would be very helpful regarding the exact interpretation of the structures, but are probably difficult for practical reasons as young ontogenetic stages will be hard to obtain.

Kerr (1969) points out a transparent coating over the foliage leaves. This is reminiscent of a similar surface in some southern African *Satyrium* and *Holothrix* species that have similar basal leaves adpressed to the substrate, where it has been interpreted as a water-storing device (Linder & Kurzweil, 1999: 27).

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References

Kerr, A.D. 1969. On a collection of orchids from Laos. *Natural History Bulletin of the Siam Society* **23**: 185-211.

Linder, H.P. and H. Kurzweil. 1999. *Orchids of southern Africa*. A.A. Balkema, Rotterdam.

Pridgeon, A.M., P.J. Cribb, M.W. Chase and F.N. Rasmussen. 2001. *Genera Orchidacearum, vol. 2 (Orchidoideae, part 1)*. Oxford University Press, New York.

Seidenfaden, G. 1977. Orchid genera in Thailand V. Orchidoideae. *Dansk Botanisk Arkiv* **31**: 1-149.

Seidenfaden, G. 1992. The orchids of Indochina. *Opera Botanica* **114**: 1-502.

Summerhayes, V.S. 1968. Orchidaceae (part 1), pp. 1-235. In Milne-Redhead, E. & Polhill, R.M.(eds), *Flora of Tropical East Africa*. Crown Agents for Oversea Governments and Administrations, London.