

## *Habenaria crassilabia* (Orchidaceae): A New Record for the Flora of Japan

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(Received 16 February 2011; accepted 23 March 2011)

**Abstract** *Habenaria crassilabia* Kraenzl. (Orchidaceae) is newly recorded for Japan. The plant was found on Niijima Island, Izu Islands. Taxonomic problems surrounding *H. crassilabia* are also elucidated. *Habenaria chejuensis* Y. N. Lee & K. Lee is reduced to a synonym of *H. crassilabia*. Three closely related species, *H. longiracema* Fukuy., *H. lucida* Wall. ex Lindl., and *H. shweliensis* W. W. Smith & Banerji are recognized.

**Key words**: *Habenaria chejuensis*, *Habenaria crassilabia*, Izu Islands, Japan, new record, Orchidaceae, taxonomy.

### Identification of a *Habenaria* species from Niijima Island

The genus *Habenaria* Willdenow is a large, cosmopolitan orchid genus comprising about 600 species. So far, seven species have been recorded in Japan. In September 2003, Mr. Nizaemon Yamashita found several flowering plants similar to *H. iyoensis* (Ohwi) Ohwi on Niijima Island, Izu Islands, situated 160 km south of Tokyo. The material was different from *H. iyoensis* by its up curved mid-lobe of the labellum and oblanceolate lateral lobes of the labellum. We examined *Habenaria* species collected in Eastern Asia and found that the concept of *H. crassilabia* Kraenzl., which was described from plants collected in northern Yunnan Province, China, coincides with the Niijima material. Examination of a photo of the type specimen corroborated this view. Further, *H. chejuensis* Y. N. Lee & K. Lee, described from Jeju Island, Korea, also matches *H. crassilabia* and is treated here as a synonym of the latter species.

Character states of reproductive parts in a

Taiwanese species, *Habenaria longiracema* Fukuy. are indistinguishable from those in *H. crassilabia*. However, the former has a taller stem with more flowers and larger leaf dimensions than the latter (stem: 30–80 cm tall in the former and 13–36 cm tall in the latter; leaf: 10–25 cm long in the former and 3–8.4 cm long in the latter). We therefore keep *H. longiracema* as a separate species. Further investigations may result in these being recognised as conspecific. Besides, Lin (1977) and Chen and Cribb (2009) treated *H. longiracema* as a synonym of *H. lucida*. They are, however, different in the lengths of pedicellate ovary and spur.

### Taxonomic issues surrounding *Habenaria crassilabia*

*Habenaria crassilabia* has been overlooked in most taxonomic and floristic studies in Eastern Asia and several taxonomic problems remain. Seidenfaden (1977) observed the type specimen of *H. crassilabia* and concluded that it is conspecific with *H. lucida* Wall. ex Lindl. However, the

former has a much shorter pedicellate ovary and spur than those of the latter (5–10 mm versus 15–18 mm for the pedicellate ovary; 3–6 mm versus 15–21 mm for the spur) and the former has spreading lateral sepals and spreading lateral lobes of the labellum as opposed to reflexed postures of these parts in the latter species. These differences warrant separate species status of the two entities. Since these two species share a salient character, namely the up-curved mid-lobe of the labellum, and because they show overall similarity in both vegetative and reproductive parts, collections identified as *H. lucida* in China and Indochina may include *H. crassilabia*.

Lang (1999) placed *Habenaria crassilabia* as a synonym of *H. shweliensis* W. W. Smith & Banerji, an insufficiently known species described from Myanmar. We observed photos of the type specimen of *H. shweliensis* and recognized that the most obvious differences between them are the shape of the mid-lobe of the labellum (quadrate with ligulate apex in *H. shweliensis*; lanceolate in *H. crassilabia*) and the shape of the spur (falcate and prominently widened about the middle in *H. shweliensis*; clavate in *H. crassilabia*). Besides, the spur length of *H. shweliensis* in the protologue is erroneous; it should read “3 mm long”.

*Habenaria recurva* Rolfe ex Downie, another species similar to *H. crassilabia*, was described from a plant collected in Thailand. Seidenfaden (1977) treated it as a synonym of *H. lucida* and we agree with this treatment. *Habenaria recurva* var. *erectiflora* Tang & F. T. Wang was described based on plants from Yunnan, China. In the protologue the authors noted that the new variety differs from the type in its erect or erect-spreading flowers. There are no obvious differences between the holotype of this variety kept at PE and *H. lucida* (Xiaohua Jin, personal communication).

### Description

The following description is based on the Niijima material. Since we observed only a few

plants, greater range in variation can be expected among the individuals.

*Habenaria crassilabia* Kraenzl., Repert. Spec. Nov. Regni Veg. **17**: 108 (1921). TYPE: CHINA: Yunnan, Pa yen tsin, *S. Tén* 1333 (C–holotype!).

*Habenaria chejuensis* Y. N. Lee & K. Lee, Korean J. Pl. Taxon. **28**: 34 (1998), **syn. nov.** TYPE: KOREA: Jeju Is., Daechongup, 24 August 1997, *Y. Lee, K. Lee et S. Mun s. n.* (Korean Plant Research Institute–holotype).

*Habenaria shweliensis* auct. non W. W. Smith and Banerji. Lan, Fl. Reipubl. Popularis Sin. **17**: 475 (1999), pro parte, excl. typum. Chen & Cribb, Fl. China **25**: 158 (2009), pro parte, excl. typum.

Plant terrestrial, entirely glabrous, 13–28 cm tall. **Tuberoïds** ellipsoid-cylindrical, 12 mm long, 6–8 mm in diameter. **Roots** few, cylindrical, up to 8 mm long. **Stem** erect, terete, with 3–5 leaves at base. **Basal sheaths** 3, tubular, amplexicaul, membranaceous; uppermost with blade, 12 mm long. **Leaves** 3–5, oblong-elliptic, oblanceolate, acute-acuminate, rather coriaceous, lucid, base contracted into amplexicaul sheath, green, 51–84 mm long, 12–18 mm wide. **Inflorescence** terminal, erect, terete, 6-ridged, racemous, rather lax, 8- to 15-flowered, 10–25 cm long; rachis shorter than peduncle; scales up to 5, scattered, lanceolate, acute, membranaceous, 11–25 mm long; floral bracts longer than or subequal to pedicellate ovaries, lanceolate, acute, membranaceous, 7–13 mm long. **Flowers** pale, yellowish-green. **Pedicellate ovary** narrowly ovoid, 6-ridged, twisted, with narrow neck, 7–10 mm long, 1.3 mm in diameter. **Dorsal sepal** ovate, concave, abaxial surface costate, forming a hood with petals, obtuse, 3 mm long. **Lateral sepals** obliquely ovate, concave, porrect, obtuse, 3.2 mm long. **Petals** obliquely oblong, undulate, thick, truncate, 3 mm long. **Labellum** thick, 3-lobed from base; lateral lobes oblong-oblanceolate, porrect, parallel to lateral sepals, obtuse, 3 mm long; mid-lobe, lanceolate, curved upward, apex

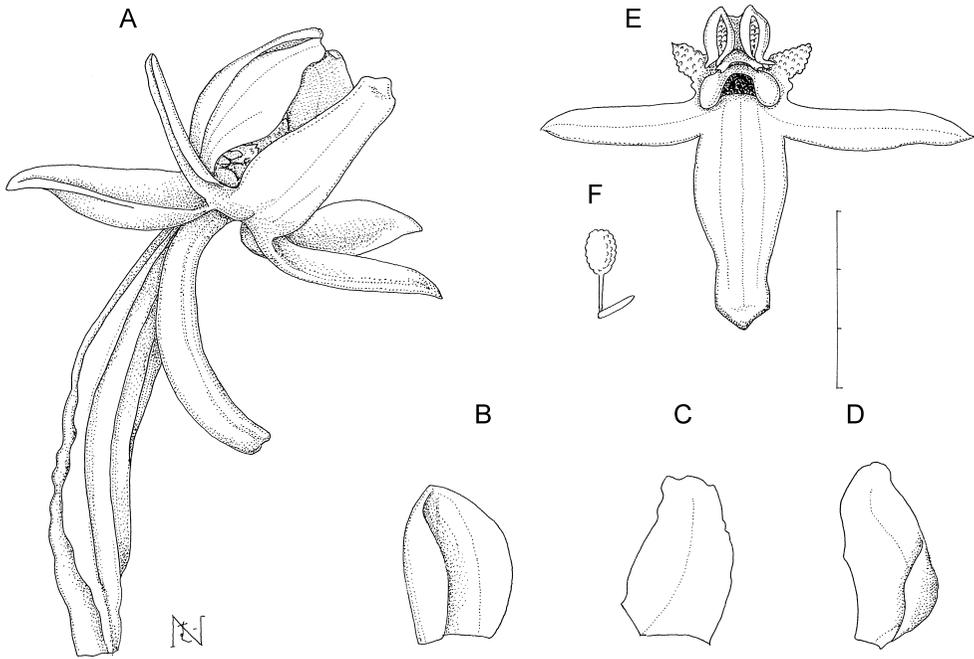


Fig. 1. *Habenaria crassilabia* Kraenzl. **A**. Flower, front view; **B**. Dorsal sepal; **C**. Petal; **D**. Lateral sepal; **E**. Lip; **F**. Pollinarium. Drawn from *M. Yagi s.n.* (coll. 6 September 2009, TNS) by M. Nakajima. Scale bar=3 mm.

adnate to petals, obtuse, 3.2 mm long; spur clavate, pendulous, curved forward, shorter than pedicellate ovary, 4.5 mm long. **Column** 1.5 mm long; auricles on lateral sides, conspicuous, rugose; connective narrow; stigmas clavate; pollinia 2 mm long. Figs. 1 and 2.

Japanese name: Niijima-tonbo (nov.).

Flowering period: Late August to early October.

Distribution: JAPAN: Izu Islands (Niijima); KOREA: Jeju-do; CHINA: Yunnan.

Ecology: In Niijima, the plants inhabit rather open, mesic sites on the floor of warm-temperate evergreen broad-leaved forests dominated by *Castanopsis sieboldii* (Makino) Hatus. ex T. Yamaz. et Mashiba, *Camellia japonica* L., and *Machilus thunbergii* Sieb. et Zucc. About 150 individuals were found growing on a hill from 200 to 220 m a.s.l.

Conservation: Since this species has been found only from a single metapopulation in Japan and the number of the flowering plants is between 10 and 20, the category, critically endan-

gered (CR B1a+2a; D) is appropriate (IUCN, 2001).

Specimens examined: JAPAN, Izu Islands: Niijima Island, southern part, alt. 200 m, 2 September 2006, *M. Yagi s.n.*; Niijima Island, southern part, alt. 200 m, 6 September 2009, *M. Yagi s.n.* (TNS 1135583).

#### Taxonomic summary of the taxa closely related to *Habenaria crassilabia*

The results of this study also changed taxonomic interpretations of the entities allied to *H. crassilabia*. We recognize the following three taxa in this species group:

*Habenaria longiracema* Fukuy., Bot. Mag. (Tokyo) **49**: 758 (1935). TYPE: TAIWAN: Takao, Tyosyu-gun, Kinariman, *K. Segawa s.n.* (KPM—holotype!).

*Peristylus longiracemus* (Fukuy.) K. Y. Lang, Acta Phytotax. Sin. **25**: 448 (1987).

*Habenaria lucida* auct. non Wall. ex Lindl. Lin,



Fig. 2. *Habeneria crassilabia* Kraenzl. from the habitat of Nijijima Island, Japan. A. Habit (photo courtesy of Nizaemon Yamashita); B. Flower, front view; C. Flower, side view.

Native Orch. Taiwan 2: 198 (1977). Chen & Cribb, Fl. China 25: 158 (2009), pro parte.

***Habeneria lucida*** Wall. ex Lindl., Gen. Sp. Orchid. Pl.: 319 (1835). TYPE: MYANMAR: Rangoon, *Wallich 7047* (K–holotype).

*Habeneria dilatata* subsp. *lucida* (Wall. ex Lindl.) S. S. Ying, Col. Ill. Orch. Taiwan 2: 217 (1990).

*Platantheroides lucida* (Wall. ex Lindl.) Szlach., Richardiana 4: 107 (2004).

*Habenella lucida* (Wall. ex Lindl.) Szlach. & Kras-Lap., Richardiana 6: 37 (2006).

*Habeneria recurva* Rolfe ex Downie, Bull. Misc. Inform. Kew 1925: 420 (1925). TYPE: THAILAND: Doi Suthep, *Kerr190* (K–holotype).

*Habeneria recurva* var. *erectiflora* Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. 10: 41 (1940). TYPE: CHINA: Yunnan, Che-li Hsien, alt. 700 m, *C. W. Wang 75464* (PE–holotype)

***Habeneria shweliensis*** W. W. Sm. & Banerji, Rec. Bot. Surv. India 6: 33 (1914). TYPE: MYANMAR: Ruby Mines Division, Mogok, Shweli Valley, *Rodger 387* (CAL–holotype!).

Excluded taxon from this species complex:

*Hetaeria taiwaniana* S. S. Ying, Col. Ill. Indig. Orch. Taiwan 1: 210 (1977).

Ying (1990) placed it as a synonym of *Habeneria dilatata* subsp. *lucida* (Wall. ex Lindl.) S. S. Ying. Su (2000) and Chen and Cribb (2009) followed this interpretation. However, the

protologue of *Hetaeria taiwaniana* clearly depicts characteristics of *Hetaeria*, a distantly related genus from *Habenaria* and it should be excluded from a synonym of *Habenaria lucida*.

**Key to the taxa closely related to *Habenaria crassilabia***

- A. Spur cylindrical, 15–21 mm, longer than pedicellate ovary; lateral sepals and lateral lobes of labellum reflexed ..... *H. lucida*
- A. Spur clavate or falcate, 3–6 mm, shorter than pedicellate ovary; lateral sepals and lateral lobes of labellum spreading, not reflexed
  - B. Spur falcate, bulged around the middle; mid-lobe of labellum quadrate with ligulate apex; floral bracts 5 mm long ..... *H. shweliensis*
  - B. Spur clavate; mid-lobe of labellum lanceolate; floral bracts 7–15 mm long
    - C. Stem 13–36 cm tall; leaves 3–8.4 cm long ..... *H. crassilabia*
    - C. Stem 30–80 cm tall; leaves 10–25 cm long ..... *H. longiracema*

**Acknowledgments**

We would like to thank Xiaohua Jin, Teruo Katsuyama, C. Sathish Kumar, and Henrik Aerenlund Pedersen for locating and photographing critical specimens, Nizaemon Yamashita for sharing his observations and providing photographs, Stephan Gale for critical reading of the manuscript, and Mutsuko Nakajima for preparing illustrations. This study is partly supported by a Grant-in-Aid to Scientific Research from the Japan Society for Promotion of Science (No. 21370038) and a research grant from the National Museum of Nature and Science for T. Yukawa.

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