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# A New Species of *Hetaeria* (Orchidaceae) from Hainan, China

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**ABSTRACT.** *Hetaeria shiuyingiana* L. Li & F. W. Xing, a new species of Orchidaceae (Orchidoideae, Cranichideae, Goodyerinae) from Hainan, China, is described and illustrated. It has previously been misidentified as the related *H. nitida* Ridley, but differs in its larger flowers, broader, obovate petals, lip hypochile with finger-like tripartite papillae, and column with two fleshy sigmoid wings. A key is provided to distinguish the seven species of *Hetaeria* Blume known from China.

**Key words:** China, Hainan, *Hetaeria*, IUCN Red List, Orchidaceae.

*Hetaeria* Blume is a genus of terrestrial orchids (Orchidoideae, Cranichideae, Goodyerinae) (Pridgeon et al., 2003). It comprises about 30 species, distributed in tropical Africa, the Himalayan region, through Southeast Asia to New Guinea, Australia, New Caledonia, and Fiji (Su, 2000; Pridgeon et al., 2003). The generally accepted characters of the genus are the inflorescences with several to many flowers that have the lip in a non-resupinate position, one to many papillae or glands on each side of the sac-shaped hypochile, and the bifid rostellum that rises vertically with the lateral stigmas at the base (Seidenfaden, 1978). In China, there are six species, with four reported from Hainan Province (Lang, 1999; Yeh et al., 2005; Song et al., 2007).

During a botanical expedition to Baoting County in Hainan Province in 2005, an unusual *Hetaeria* was collected by Xin-Sheng Qin. Morphological study shows that it closely corresponds to a plant that has been previously identified as *H. nitida* Ridley by Hu (1977: 49). In China, the name was based on a single specimen, *Hu 13233* (K), collected in Hong Kong, but the identification was later disputed by Seidenfaden and Wood (1992), as *H. nitida* has smaller flowers and spatulate petals. In fact, more than a decade earlier Seidenfaden had suggested that plants from Khao Sabab in Thailand that had been identified as *H. nitida*, which have considerably broader petals than the type specimen of *H. nitida* (Curtis s.n., SING), as well as the other specimens cited in their treatment

(Seidenfaden & Smitinand, 1965), ought to be considered a separate species (Seidenfaden, 1978). Because the 2005 collection provided insufficient material for identification, we temporarily regarded this new collection as an imperfectly known species.

In 2006, more material of this species was collected by the authors in Ledong, Baoting, and Wuzhishan counties from Hainan Province, and we now have quite a few living plants in the greenhouse of the South China Botanical Garden, Chinese Academy of Sciences, where they have flowered every year in March since 2005. Detailed literature study (Hooker, 1890, 1894; Ridley, 1896; Holttum, 1957; Seidenfaden & Smitinand, 1959, 1965; Backer & Bakhuizen van den Brink, 1968; Seidenfaden, 1978, 1992; Bose & Bhattacharjee, 1980; Yeh et al., 2005; Song et al., 2007) and comparison with orchid specimens in K, KUN, IBSC, and PE revealed that this species is indeed similar to *H. nitida*, but is remarkably different in its column wings. In fact, the characters associated with these structures are quite distinctive in the genus and are critical in determining its taxonomy (Fig. 1). This species is further distinguished from *H. nitida* in its larger flowers, broader, obovate petals, and lip hypochile with finger-like tripartite papillae. A detailed study of our fresh collections clearly establishes that the Hainan plants represent a new species. A key to the *Hetaeria* species from China, based on these essential details of the flowers, is provided below. It is noteworthy that, based on the present material, there is no true *H. nitida* in China. Some specimens previously considered to be *H. nitida* (Barretto & Young, 1980; Siu & Chau, 1999) could very well be identical with this new species.

***Hetaeria shiuyingiana*** L. Li & F. W. Xing, sp. nov.

TYPE: China. Hainan: Ledong County, eastern Jianfeng Mtn., Weidong Forestry Center, fl. in cult. at South China Botanical Garden, 8 Apr. 2007, *Li Lin 014* (holotype, IBSC). Figure 1.

Species *Hetaeriae nitidae* Ridley affinis, sed ab ea floribus manifeste majoribus, petalis latioribus oblique obovatis, hypochilo labelli saccato basi utrinque papillis tripartitis 2-seriatis et plerumque papilla solitaria simplici gracili ornato

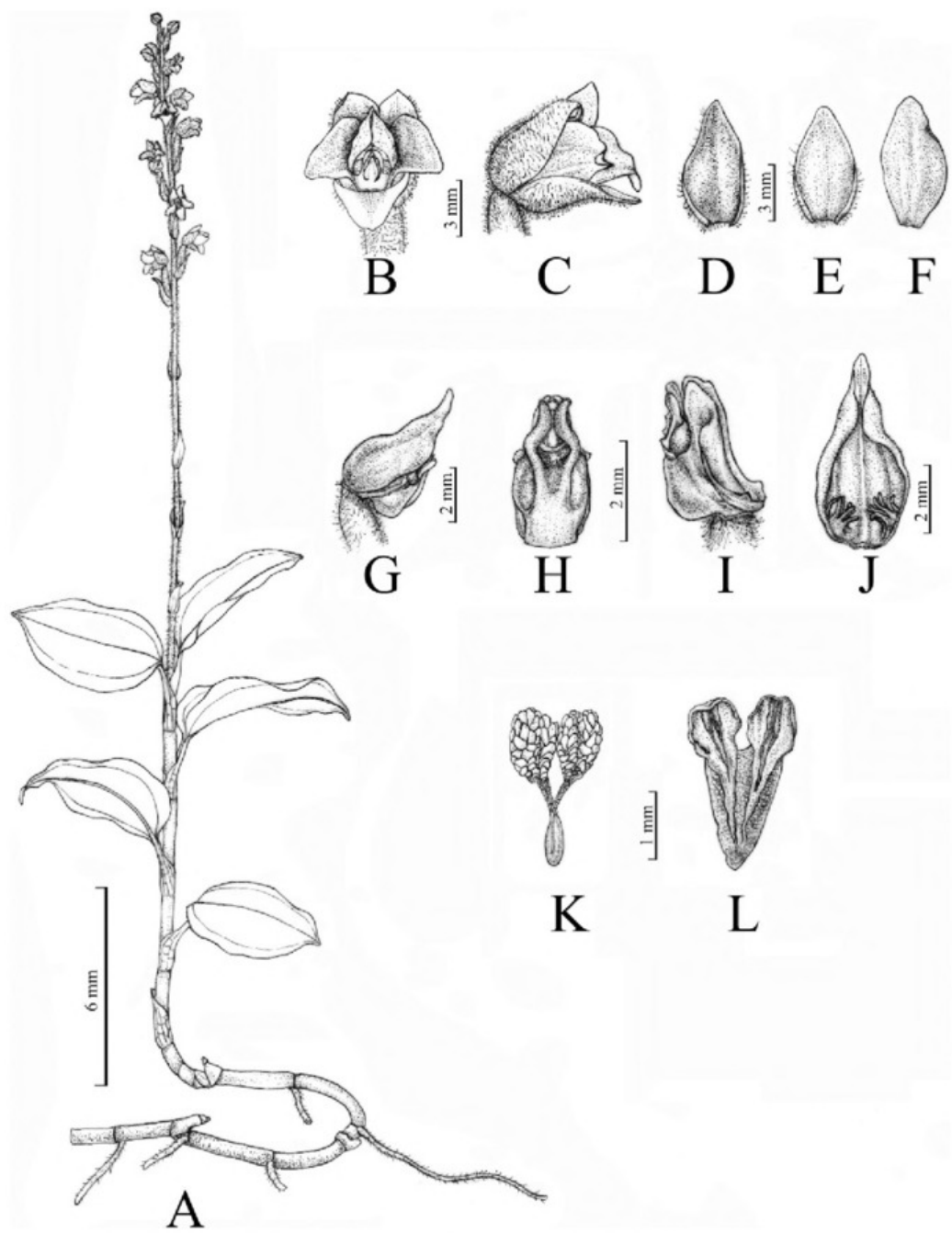


Figure 1. *Hetaeria shiuyingiana* L. Li & F. W. Xing. —A. Habit. —B. Front view of flower. —C. Lateral view of flower. —D. Lateral sepal. —E. Dorsal sepal. —F. Petal. —G. Lateral view of flower with sepals and petals removed. —H. Front view of column. —I. Lateral view of column. —J. Lip. —K. Pollinia. —L. Operculum. Drawn from the holotype *Li Lin 014* (IBSC).

atque columnae alis 2 plerumque minute papillosis aliquanto sigmoideis sursum extensis rostellis lobis aequilongis vel eis longioribus differt.

Erect terrestrial herb, up to 20 cm tall; rhizome terete, creeping, several-noded, fleshy, 5–20 cm, 2–3 mm thick; internodes 2–3 cm; roots arising from rhizome nodes, elongate, pubescent; stem erect, ascending from rhizome, glabrous, succulent, dark purple, 8–15 cm, 4–5 mm diam., 2- to 5-leaved. Leaves ovate, 5–8 × 2–4 cm, apex shortly acuminate, base obliquely obtuse or round, deep green and lustrous adaxially, pale abaxially, distinctly 3-veined;

petioles 2.5–3 cm, sheathed at base. Inflorescence slender; peduncle 20–22 cm, pubescent; sterile bracts 4, lanceolate, 1–2 cm, pinkish brown; rachis 7–9 cm, loosely spaced typically with 14 to 18 flowers; floral bracts lanceolate, 7–9 mm, puberulent outside, shorter than ovary. Flowers not resupinate, not opening widely; ovary densely glandular-pubescent, cylindrical, 8–10 mm; sepals subequal, obliquely ovate, obtuse at apex, densely glandular-pubescent, 6–7 × 3–4 mm, olive-green, pink along the margin and at apex; dorsal sepal slightly recurved at apex; lateral sepals embracing the base of the lip, slightly smaller;

petals connivent with dorsal sepal and forming an inverted hood, glabrous, lateral, obliquely ovate, apex obtuse, 6 mm long, 3–3.5 mm wide across the middle, glistening pinkish white, slightly curved outward; lip adnate to margins of the column, honey yellow in color, fleshy, lageniform, 5.6 mm long, 2.2 mm thick at base, with a short mesochile and 3-partite; hypochile concave, saccate, ca. 2.5–3 mm, containing 2 groups of tripartite papillae at base on each side, arranged along the lateral veins, usually with 1 separate basal slender papilla near the groups; mesochile with involute margins, folding inward with an orange-colored patch; column short and stout, ca. 1 mm high at the back, 2 mm wide across the middle, extending upward into 2 fleshy  $\pm$  sigmoid wings, usually with a minutely papillose surface, pointing upward on each side ventrally, with upcurved lower edges laterally; epichile entire, attenuate, margins involute, 1–1.2 mm, white; anther ovoid, 2-locular; pollinia 4 in 2 pairs, sectile, clavate, basally attenuate into slender caudicles, attached to an oblong viscidium; rostellum erect, bifid, with 2 broad arms, linear-oblong, ca. 1 mm, gradually narrowing toward apex; stigmas 2, lateral. Capsule erect, fusiform.

**Distribution and habitat.** This terrestrial orchid grows in wet and shady areas at elevations of 600 to 800 m, in Hainan and Hong Kong, on the windward side of evergreen broad-leaved forests, in the low understory.

**IUCN Red List category.** *Hetaeria shiuyingiana* is known only from small populations in Ledong, Baoting, and Wuzhishan counties from Hainan Province, and only a single specimen (collected in 1971) has been collected from Hong Kong. We estimate its population to total fewer than 250 mature individuals. In addition, Ridley (1896) reported that the leaves of *H. obliqua* Blume are used as medicine

in peninsular Malaysia, and it is possible that *H. shiuyingiana* might also be collected for use as medicine. For these reasons, *H. shiuyingiana* can be considered at high risk of extinction in the wild, and should be classified as Endangered (EN) according to criterion D (restricted population size) of the IUCN Red List criteria (IUCN, 2001).

**Phenology.** *Hetaeria shiuyingiana* flowers in March and April.

**Etymology.** The species epithet honors the well-known Chinese botanist, Hu Shiu Ying (1908–), of the Chinese University of Hong Kong, who has shared her rich knowledge of this orchid with us.

**Relationships.** *Hetaeria shiuyingiana* is similar to *H. nitida* from Penang, Malaysia, but differs in its conspicuously larger flowers (sepals 6–7  $\times$  3–4 mm), its petals that are broader (3–3.5 mm wide) and obliquely ovate, the lip hypochile with a pair of tripartite papillae and usually a single basal slender and finger-shaped papilla at the base on each side, and the two thick, more or less sigmoid wing-like appendages on the ventral side of the column, usually as long as or slightly longer than the rostellum arms. *Hetaeria nitida*, on the other hand, has much smaller flowers (sepals ca. 4  $\times$  2 mm), spatulate petals (0.8–1.6 mm wide) that are not noticeably oblique, the lip hypochile with a pair of close papillae with irregular terete fleshy branching, and rostellum arms that extend above the column wings, which are rather large, broad, oblong flaps that are curved and folded.

**Paratypes.** CHINA. **Hainan:** Baoting County, Ganzhaling, 800 m, 20 July 2006, *Li Lin* 017 (IBSC); Wuzhi Mtn., in cult. at South China Botanical Garden, 16 Apr. 2007, *Li Lin* 108 (PE).

#### KEY TO THE SPECIES OF *HETAERIA* FROM CHINA

- 1a. Lip with conspicuously enlarged epichile, bilobulate, with large orbicular lobules . . . . . *H. anomala* Lindley
- 1b. Lip with an acuminate or slightly enlarged epichile, entire or 3-lobed.
  - 2a. Epichile slightly enlarged.
    - 3a. Epichile 3-lobed; sac of the hypochile with 2 hornlike papillae; disc with one group of irregular minute warts or with 2 short keels . . . . . *H. cristata* Blume
    - 3b. Epichile entire, most often heart-shaped; sac of the hypochile with 2 oblong, 2- to 4-lobed papillae in each half; disc without warts or keels. . . . . *H. affinis* Lindley
  - 2b. Epichile acuminate.
    - 4a. Sac of the hypochile with about 5 rather slender papillae in each half, most often spread along the 4 lateral veins.
      - 5a. Petals linear to lanceolate, ca. 1 mm broad, usually less; the strongly sigmoid wings on front of column usually with vertical triangular acute tips at their upper part . . . . . *H. oblongifolia* Blume
      - 5b. Petals rhombic to obovate, > 2 mm broad; the broad obtuse upper part of the column wings usually bent inward and overlapping. . . . . *H. finlaysoniana* Seidenfaden
    - 4b. Sac of the hypochile with ca. 1 pair of usually lobed or split thick papillae in each half, most often close beside each other.
      - 6a. Petals spatulate, not very oblique; sac of the hypochile with 2 or 3 papillae close beside each other in each half, shaped like flat scales with an irregularly lobed or dentate apex . . . . . *H. obliqua* Blume

- 6b. Petals obliquely ovate; sac of the hypochile with 2 close series of tripartite papillae and 1 single slender finger-shaped papilla near the series in each half . . . . . *H. shiuyingiana* L. Li & F. W. Xing

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