
Hemipiliopsis, a New Genus of Orchidaceae

Yibo Luo and Singchi Chen (Xinqi Chen)

Laboratory of Systematic & Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Nanxincun 20, Xiangshan, Beijing, 100093, People's Republic of China.
luoyb@ns.ibcas.ac.cn

ABSTRACT. *Hemipiliopsis*, a monotypic new genus of Orchidaceae, is described based on *H. purpureopunctata* (K. Y. Lang) Y. B. Luo & S. C. Chen (*Habenaria purpureopunctata* K. Y. Lang) from southeastern Xizang (Tibet). Its possible relationships to *Brachycorythis*, *Hemipilia*, and *Habenaria* are discussed.

Key words: China, *Hemipiliopsis*, Orchidaceae.

While the senior author worked on the genus *Hemipilia* Lindley, he felt it difficult to treat a species that is very similar in habit to *Hemipilia* but was described by Lang (Lang & Tsi, 1978) as *Habenaria purpureopunctata* K. Y. Lang. Moreover, Lang mentioned that this generic placement was based on the presence of a small rostellum, naked viscidia, and two protruding clavate stigmas (Lang & Tsi, 1978). Based on these floral features, this species appeared to be allied with *Habenaria* Willdenow, while its purple-spotted stem, leaf, and other parts, as well as a large-mouthed spur with a globular-swelled tip indicate its close relationships to *Hemipilia*. Two years later, Lang (1980) stated that *Habenaria purpureopunctata* is intermediate between *Habenaria* and *Hemipilia*.

During a trip of the senior author to southeastern Xizang (Tibet) in 1996, several plants of this species were collected and later transplanted to our greenhouse. They flowered the next year, so we had the opportunity to investigate its floral morphology and ontogeny. As a result, *Habenaria purpureopunctata* was tentatively proposed as a new genus of Orchidiinae s. str. (sensu Dressler, 1993) rather than a member of Habernariinae (sensu Dressler, 1993; Luo et al., in prep.). Moreover, the nuclear ribosomal DNA internal transcribed spacers (ITS) data supported the placement of *Habenaria purpureopunctata* in the subtribe Orchidiinae s. str. (sensu Dressler, 1993; Bateman et al., 2001). It is treated here as a separate new genus differing from both *Habenaria* and *Hemipilia*.

Hemipiliopsis Y. B. Luo & S. C. Chen, gen. nov.

TYPE: *Hemipiliopsis purpureopunctata* (K. Y. Lang) Y. B. Luo & S. C. Chen.

Hoc genus novum *Hemipiliae* et *Habenariae* simile, sed ab amobus forma calcaris, a priore viscidiiis plus minusve expositis, stigmati lobulis duobus elongato-pulvinatis, a posteriore planta (cum caule, folio, pedunculis, rachidi, bracteis, pedicellis, ovariis, sepalis et petalis) purpureopunctata, stigmati lobulis parieti postico cavitatis affixis, atque rostello magno differt.

Terrestrial herb; tubers ellipsoid or subellipsoid, fleshy. Stem erect, usually with one leaf near the base. Leaf elliptic to ovate-oblong, acuminate or acute, amplexicaul at base. Inflorescence loosely several- to many-flowered, spotted with purple on rachis and peduncle; bracts ovate-lanceolate, with evident purple spots dorsally; pedicel and ovary with purple spots. Flowers spotted with purple except the lip; dorsal sepal erect, oblong, concave, forming a hood together with petals; lateral sepals obliquely ovate-elliptic, usually \pm reflexed; petals ovate-orbicular; lip subobovate or \pm fan-shaped, 3-lobed at apex, the lobes nearly oblong, the lateral lobes broader than the central one, spur abruptly contracted in basal part and then strongly expanded to form a globose apex; anthers sessile, erect, with two parallel thecae; lateral gynostemium appendages obvious and positioned next to anther; rostellum three-lobed, with two separate lateral lobes bearing naked viscidia at apex, the lateral lobes extending forward, but not along walls of cavity and their apices completely separate, the viscidia positioned directly above spur mouth; the extended, two-folded central lobe approximately half as long as anther; fertile stigma situated in a cavity and consisting of two elongated pads adnate to its posterior wall, positioned below rostellum and directly above spur mouth; pollinia sectile, fragile, each proximally attenuated into a caudicle attached to viscidium.

Hemipiliopsis purpureopunctata (K. Y. Lang) Y.

B. Luo & S. C. Chen, comb. nov. Basionym: *Habenaria purpureopunctata* K. Y. Lang, Acta Phytotax. Sin. 16(4): 127, fig. 2. 1978. TYPE: China. SE Xizang (Tibet): Bomi, 2500 m, 19 July 1965, Y. T. Chang & K. Y. Lang 384 (holotype, PE). Figure 1.

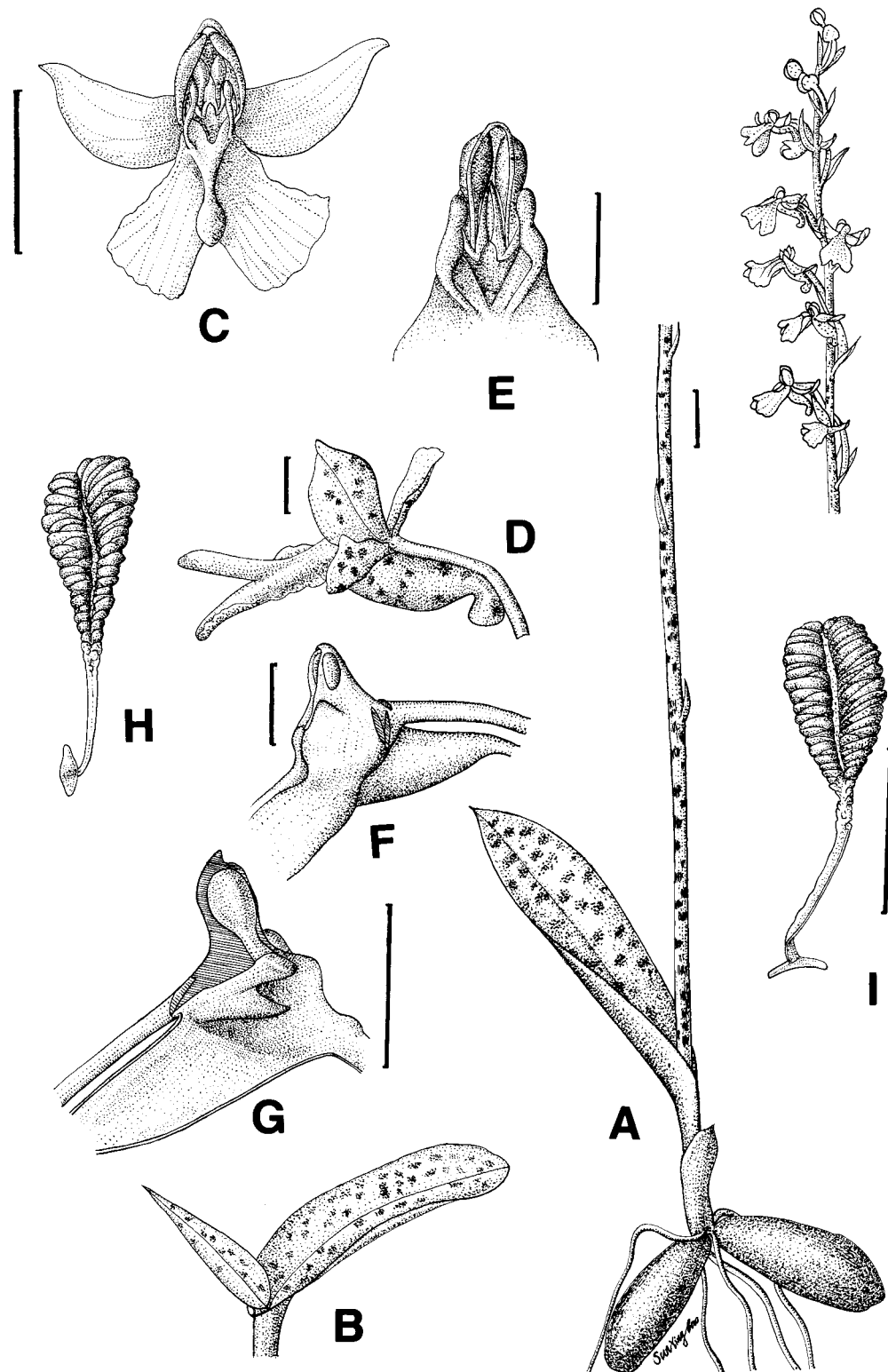


Figure 1. *Hemipiliopsis purpureopunctata* (K. Y. Lang) Y. B. Luo & S. C. Chen. —A. Plant. —B. Plant with two leaves. —C. Flower, front view. —D. Flower, lateral view. —E. Column, front view. —F. Column, lateral view. —G. Longitudinal section of column. —H. Pollinium with viscidium, vertical view. —I. Pollinium with viscidium, lateral view. Scale bar: A–C = 1 cm; E = 0.5 mm; D, F, G = 1 mm; H, I = 0.25 mm. Drawn from specimen of *Y. B. Luo 14* in cultivation.

Plant covered with purple spots throughout, 20–50 cm tall; tubers 2–4 × 1.5–2.0 cm; stem, usually with 2 to 5 sterile bracts above the leaf. Leaf slanting upward, 5–15 × 2–5 cm, green with purple spots above, light purple beneath. Inflorescence 8–20 cm long, loosely 2- to 20-flowered; bracts usually shorter than ovary; pedicel and ovary 13–15 mm long, with purple spots. Flowers light purple or white purple; dorsal sepal ca. 5 × 2 mm, rounded or obtuse, 3-nerved; lateral sepals, ca. 6 × 4 mm, obtuse, 3-nerved; petals ca. 5 × 4 mm, obtuse, 3-nerved; lip 10–11 mm long, 9–10 mm wide in upper part, 3-lobed at apex, the lobes irregularly undulate along apical margins; spur 9–10 mm long, 2–3 mm thick, contracted at a distance of ca. 1.5 mm from spur mouth, the globose apex ca. 2–3 mm diam. Capsule ellipsoid, with purple spots, 15 mm long, 2–3 mm diam. Flowering: June to July; fruiting: August to September.

This species is distributed in Nyingch, Lhünze, Mainling, Bomi, and Zayu, southeastern Xizang, China, between 2100 and 3400 m, growing in broad-leaved evergreen forest, alpine oak forest, grassy places, and sandy soil along rivers. It also occurs in Assam.

In habit *Hemipiliopsis* is similar to *Hemipilia* (Lang & Tsi, 1978; Lang, 1980; Lang, 1999), but differs from the latter by being covered with purple spots throughout (Chen et al., 1999).

As to its floral morphology, *Hemipiliopsis* has pad-like stigmas adnate to the walls of the cavity, a typical feature in the subtribe Orchidinae (Kurzweil, 1987; Kurzweil & Weber, 1991; Luo & Chen, 2000). It also lacks some typical features of *Habenaria*, such as obvious anther canals and strongly convex or stalked stigmas (Kurzweil & Weber, 1992; Luo et al., in prep.). Therefore, the floral morphological evidence does not support a close relationship between *Hemipiliopsis* and *Habenaria*. On the other hand, this species is quite different from *Hemipilia* in many floral features. For example, the genus *Hemipilia* is characterized by (1) a well-developed three-lobed rostellum with the central lobe conspicuously projecting upward as high as or higher than the anther; (2) lateral lobes of the rostellum being completely separate and extending along the walls of the cavity, forming a shallow channel together with the prominently extended basal parts of the lateral gynostemium appendages in which the anther caudicle is positioned; and (3) the viscidia being positioned on the inner sides of the wall of the cavity (Luo & Chen, 1999, 2000). In *Hemipiliopsis*, however, the three-lobed rostellum does not have well-developed lobes, the lateral

lobes extend straight forward but not along the walls of the cavity, and the viscidia are positioned directly above the spur mouth (Luo et al., in prep.).

The rostellum structure of *Hemipiliopsis* is similar to that of *Brachycorythis* Lindley (Kurzweil & Weber, 1991), especially that of *B. tanganyikensis* Summerhayes (Cribb, 2001). The lateral rostellum lobes of *Brachycorythis* are adjacent at their apexes as illustrated by Kurzweil and Weber (1991, figs. 1, 2) except in *B. tanganyikensis*, where they are obviously separated at their apexes as shown by Cribb (2001, fig. 65.1). However, the lateral rostellum lobes of *Hemipiliopsis* are completely separated at their apexes. In addition, *Brachycorythis* has many cauline leaves, foliaceous bracts, and a bipartite lip, by which it is clearly differentiated from *Hemipiliopsis*.

As demonstrated above, this entity has so many distinct features, both in vegetative and floral characters, as compared with other members of the tribe Orchideae (sensu Dressler, 1993) that it is reasonable to treat it as a new genus. Based on its floral morphology, especially the rostellum structure, it seems more closely related to *Brachycorythis* than to *Hemipilia*.

Specimens examined. CHINA. **Xizang:** Ma Gu Dong, hillside, P. C. Tsoong 6685 (PE); Bomi, grassy slope, Y. T. Chang & K. Y. Lang 828 (PE); forested valley, 2050 m, collector unknown 1522 (KUN, PE), Wu Chen-Yih 5638 (KUN); 2100 m, Xiao Pei-Gen et al. 2256 (KUN); 2300 m, conifer & oak forest, F. Ludlow, G. Sherriff & H. H. Elliot 13194 (BM), F. Ludlow, G. Sherriff & H. H. Elliot 15814 (BM); Nyingch, grassy place in forest, 2300–2700 m, Medicinal Plant Collecting Team (Xizang) 3422 (PE); forested slope, 2700–2800 m, Medicinal Plant Collecting Team (Xizang) 3539 (PE); under shrubs on sandy banks of a river, 2550 m, Y. B. Luo 14 (MO, PE); 3000 m, H. N. Qing et al. 533 (PE); Mainling, alpine oak forest, 3300–3400 m, collector unknown 4145 (PE); Additional Collecting Expedition to Qinghai-Xizang 750836 (KUN, PE); Lhünze, 2740 m, Additional Collecting Expedition to Qinghai-Xizang 750564 (KUN, PE); Lung, Chanyul Chu, open dry hillside, 3000–3300 m, F. Ludlow & G. Sherriff 2324 (K).

Acknowledgments. This study was supported by the National Natural Science Foundation of China (NSFC) (30270104). Henrik Pedersen and other reviewers are thanked for their positive suggestions. Thanks to Yingbao Sun for kindly preparing the line drawing.

Literature Cited

- Bateman, R. M., P. M. Hollingsworth, J. Preston, Y. B. Luo, A. M. Pridgeon & M. W. Chase. 2001. Phylogenetics. Pp. 224–232 in A. M. Pridgeon, P. J. Cribb, M. W. Chase & F. N. Rasmussen (editors), *Genera Orchidacearum* Vol. 2, part 1: Orchidoideae. Oxford Univ. Press, Oxford.

-
- Chen, S. C., Z. H. Tsi & Y. B. Luo. 1999. Native Orchids of China in Colour. Science Press, Beijing.
- Cribb, P. J. 2001. *Brachycorythis*. Pp. 265–269 in A. M. Pridgeon, P. J. Cribb, M. W. Chase & F. N. Rasmussen (editors), *Genera Orchidacearum* Vol. 2, part 1: Orchidoideae. Oxford Univ. Press, Oxford.
- Dressler, R. L. 1993. Phylogeny and Classification of the Orchid Family. Timber Press, Portland, Oregon.
- Kurzweil, H. 1987. Developmental studies in orchid flowers II: Orchidoid species. *Nordic J. Bot.* 7: 443–451.
- & A. Weber. 1991. Floral morphology of southern African Orchideae. I. Orchidinae. *Nordic J. Bot.* 11: 155–178.
- & ———. 1992. Floral morphology of southern African Orchideae. II. Habenariinae. *Nordic J. Bot.* 12: 39–61.
- Lang, K. Y. 1980. A study on the geographical distribution and floristic features of the Xizang (Tibet) orchid flora. *Acta Phytotax. Sin.* 18: 391–407.
- . 1999. *Habenaria*. P. 429 in K. Y. Lang (editor), *Flora Reipublicae Popularis Sinicae* Vol. 17. Science Press, Beijing.
- & Z. H. Tsi. 1978. Some new taxa of Orchidaceae from Tibet, China. *Acta Phytotax. Sin.* 16(4): 126–129.
- Luo, Y. B. & S. C. Chen. 1999. Observations of putative pollinators of *Hemipilia flabellata* Bur. et Franch. (Orchidaceae) in north-west Yunnan Province, China. *Bot. J. Linn. Soc.* 131: 45–64.
- & ———. 2000. The floral morphology and ontogeny of some Chinese representatives of orchid subtribe Orchidinae. *Bot. J. Linn. Soc.* 134: 529–548.