Gastrodia putaoensis sp. nov. (Orchidaceae, Epidendroideae) from North Myanmar

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Gastrodia putaoensis, a new species from the montane region in northern Myanmar, is described and illustrated. Gastrodia putaoensis is similar to G. dyeriana, but differs from it by having a narrowly triangular lip that is subdivided into two parts, with the apical part densely covered with yellow hairs and the apex obtuse and densely covered with red papillae.

Gastrodia R.Br. (Gastrodieae, Epidendroideae, Orchidaceae) is a genus of mycoheterotrophic plants, comprising approximately 90 species, distributed from India and eastern Asia, through Malaysia to Australia, as well as in tropical Africa (Pearce and Cribb 2002, Pridgeon et al. 2005, Chen et al. 2009, Cribb et al. 2010, Govaerts et al. 2016, Suetsugu 2016, 2017, Tsukaya and Hidayat 2016). Gastrodia is characterized by a tuberous rhizome, sepals united into tube throughout most of their length, a spurless lip, pollinia two and sectile, and a shield shaped stigma positioned at the base of the column (Pearce and Cribb 2002, Pridgeon et al. 2005, Chen et al. 2009).

During our fieldwork in Hkakaborazi Natural Park, Putao, Kachin State, Myanmar, from 2010 to 2016, a new species of Gastrodia, described below, was discovered.

**Gastrodia putaoensis** X.H. Jin sp. nov. (Fig. 1–3.)

A species similar to G. dyeriana, but differing by having greyish white flowers with the lip narrowly triangular and subdivided into two parts with the apical part near tip densely covered with yellow hairs, and the lip apex obtuse and densely covered with red papillae.

**Type:** Myanmar, Kachin State, Putao District, Hkakaborazi National Park, under the montane evergreen broadleaf

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Figure 1. Gastrodia putaoensis sp. nov. (A) habit, (B) sepal lobes and petals, (C) lip, (D) front view of column.
forests, 2200 m a.s.l., 17 June 2016, Xiaohua Jin et al., PT-2275 (holotype: PE!; isotypes: PE!, IBSC!).

**Etymology**
The epithet of the new species is derived from the name of Putao District, northern Myanmar, where the type was collected.

**Description**
Mycoheterotrophic leafless plant, 20–45 cm tall. Rhizome short, horizontal, greyish black with 3–5 spreading roots, 5–8 mm in diameter. Stem with 2–3, glabrous, 20–40 cm long. Inflorescence 10–15 cm long, laxly 3- to 6-flowered. Floral bracts short, ovate, membranous, 0.5 mm long. Pedicel 3 mm long. Flowers greyish white with sepal lobes slightly purple-tinged, pendent, more or less campanulate, 7–8-veined; tube 1.3 cm long, entire, 3-lobed at apex; sepal lobes triangular, their margins entire, 3 mm long, 3 mm wide; petals inserted at apex of sepal tube, ovate, 2 mm long, 2 mm wide; petal lip narrowly triangular, clawed, 5–6 mm long, 3–4 mm wide, strongly constricted at two thirds and subdivided into a basal part and an apical part, the basal part elliptic, with 3–5 parallel and thickened lines from the base to the base of the apical part, the apical part densely covered with yellow hairs, obtuse and densely covered with red papillae at apex; claw short, with two yellow, subglobose and raised calli. Column 5 mm long, with winged sides, with two long and erect teeth at apex; foot short, about 1 mm long; pollinia void. Ovary 4 mm long.

**Ecology and distribution**
*Gastrodia putaoensis* grows under montane broadleaf evergreen forest at 2000–2200 m a.s.l. During our fieldwork in Hkakaborazi in 2016, two populations with approximately 2000 plants were discovered. Both populations are far from any direct threats. Hence, this new species should be considered as ‘Least Concern’ (LC) according to IUCN Red List Categories and Criteria (IUCN 2001).

**Similar species**
Morphologically, *G. putaoensis* is closely related to *G. dyeriana*, *G. gracilis*, *G. longibubularis*, *G. menghaiensis*, and *G. wuyishanensis*. All these species have campanulate flowers and the disc of lip with a thickened line. However, *G. putaoensis* can readily be distinguished from them by...
having a triangular lip subdivided into two part, of which the apical part is densely covered with yellow hairs and the apex is obtuse and densely covered with red papillae (Table 1).

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| Flowers                  | Lip                                | Column apex |
|--------------------------|------------------------------------|-------------|
| *G. putaoensis*          | greyish white                      | two-toothed |
|                         | narrowly triangular, subdivided into a basal part and an apical part; apical part near tip densely covered by yellow hairs; apex obtuse and covered with red papillae |             |
| *G. dyeriana*            | brownish                           | four-toothed |
|                         | entire, ovate-lanceolate, not subdivided into basal part and apical part, glabrous; apex acuminate |             |
| *G. gracilis*            | yellowish brown                    | two-toothed |
|                         | entire, ovate-triangular, not subdivided into basal part and apical part, glabrous, apex obtuse, |             |
| *G. longitubularis*      | gray-brownish                      | two-toothed |
|                         | entire, ovate or cordate, not subdivided into basal part and apical part, glabrous; apex cuspidate |             |
| *G. menghaiensis*        | white                              | two-toothed |
|                         | shallowly 3-lobed, broadly ovate, subdivided into basal part and apical part, glabrous; apex obtuse |             |
| *G. wuyishanensis*       | grayish white                      | two-toothed |
|                         | entire, rhombic-ovate, not subdivided into basal part and apical part, glabrous; apex obtuse |             |

Table 1. Diagnostic character of *Gastrodia putaoensis* sp. nov. and morphologically similar species. Morphological data of related species were extracted from dried herbarium specimens and field notes, or from the original description or subsequent updated papers (Pearce and Cribb 2002, Li and Liu 2007, Meng et al. 2007, Chen et al. 2009).