

# 白赤箭，中国大陆天麻属新记录种

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**摘要:** 报道了中国大陆兰科(Orchidaceae)一新记录种: 白赤箭(*Gastrodia albida* T. C. Hsu & C. M. Kuo)。该种在广东省两个省级自然保护区内均有发现, 凭证标本保存于中国科学院华南植物园标本馆(IBSC)。白赤箭以花被管具疣状突起, 侧瓣大部分分离, 唇瓣基部平截, 合蕊柱无蕊喙而与同属其他种类相区别。提供了该种的特征描述、彩色照片及分类学信息。

**关键词:** 天麻属; 兰科; 中国大陆; 新记录; 白赤箭

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## *Gastrodia albida* T. C. Hsu & C. M. Kuo, A Newly Recorded Species of Orchidaceae from Mainland China

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**Abstract:** *Gastrodia albida* T. C. Hsu & C. M. Kuo were discovered from 2 Nature Reserves in Guangdong Province, and the vouchers were kept in the herbaria of South China Botanical Garden, Chinese Academy of Sciences (IBSC). It's distinguished by its perianth tube with moderately verrucose throughout, larger free portions of the petals, truncate based lip and absence of a rostellum. Detail descriptions, colour plates and notes on the species are provided.

**Key words:** *Gastrodia*; Orchidaceae; China; New record; *G. albida*

*Gastrodia* Brown<sup>[1]</sup> (Gastrodieae, Epidendroideae) is the largest genera of non-photosynthetic mycoheterotrophic orchids. It, so far, consists of approximately 80 accepted names<sup>[2]</sup> and is considered to comprise ca. 90 species<sup>[3-4]</sup>. The genus is characterized by underground fleshy tubers, lacking of functional leaves and chlorophyll, fusion of the sepals and petals and two mealy pollinia without caudicles<sup>[5-7]</sup>. It is widely distributed throughout the temperate and tropical regions of Asia, Oceania, Madagascar and Africa<sup>[7-9]</sup>. Southeast Asia is the modern distribution center of the genus with 24 existing species<sup>[2,10-11]</sup>. China and Australia are another two diversity hotspots with 20<sup>[9,12-16]</sup> and 15 species<sup>[17]</sup>, respectively.

As most of the life cycle being underground, a relatively short blooming period and small scattered populations, *Gastrodia* species can only be discovered when flowering or fruiting<sup>[18]</sup>, which lead to few orchid-collecting expeditions have coincided with *Gastrodia*'s blooming periods. The authors are lucky to find a species of *Gastrodia* during a floristic survey in Guangdong. After careful morphological comparison with its close relatives<sup>[9,14,19]</sup> and other species of *Gastrodia* recorded in China, we confirmed it is conspecific with *G. albida* T. C. Hsu & C. M. Kuo<sup>[14]</sup> from Taiwan, China. We thus report the first known occurrence in mainland China, which makes the number of *Gastrodia* species reach to 11 species in the

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area. A detailed description, illustration and ecological information are presented herein.

*Gastrodia albida* T. C. Hsu & C. M. Kuo, Ann. Bot. Fenn. 2011, **48**(3): 272–275. Type: China. Taiwan, Taipei County, Wulai Township, Pataoerhshan, 800 m alt., 12 Jun. 2008, T. C. Hsu 838 (holotype TAI; isotype TAIF). (Fig. 1)

Terrestrial, achlorophyllous herbs. Roots few, slender. Rhizome tuberous, fusiform, 1.5–5 cm long, grayish brown, hairy and covered with numerous scales. Scales verticillate, lanceolate, pale yellowish brown, 1–2 mm long. Inflorescence a terminal raceme, erect, 1–5 cm long; Peduncle straight or slight flexuose, 3–4 noded, with 2–3 tubular, membranous sheaths, 2–8 cm tall; rachis less than 5 mm long. Floral bracts membranous, ovate to ovate-oblong, pale brownish, 2–6 mm × 1.5–4 mm. Pedicel and ovary 5–25 mm long, ovary 2–2.5 mm in diameter. Flowers 2–8, white, erect, bell-shaped, obovate in dorsal view, not widely opening, 4–7 mm in diameter. Sepals and petals united, forming a 5-lobed perianth tube. Sepals fleshy, thickened, 9–15 mm long, connate with each other for 1/5–1/6 of their length and with petals for more than 4/5 of their length, whitish on both surfaces, outside top distinct verruculose or sometimes lightly verruculose to nearly absent, apex incurved, brownish tinged; free portion of dorsal sepal semi-orbicular. Petals connate with sepals, located near the sinus between dorsal and lateral sepals, free portions brownish, ovate-oblong, connate portions distinctly thickened and tinged orange-yellow inside, forming a pair of ridge-like structures inside perianth tube. Lip free from floral tube, white tinged orange-yellow at base and reddish at apex and margin, 3.5–4 mm × 2.2–2.5 mm, hypochile with two whitish, globose, subsessile, nectarless calli, ca. 1 mm in diameter; epichile elongated-deltoid, disc thickened and 2-ridged in middle, the ridges higher and tinged grayish-green near apex. Column white, straight, stout, 4–4.5 mm × 1.8–2 mm, with a pair of lateral wings distally; edges of lateral wings parallel to column, tips superior to anther; column foot very short or absent; rostellum

and clinandrium lacking; stigma round, located near base. Anther hemispheric, 0.6–0.8 mm long, pollinia 2. Capsule ellipsoid, 1–1.7 cm long; pedicel elongating to 15–30 cm long in fruit. Seeds fusiform. Fl. May to early June, fru. May to June.

**Additional specimens examined: CHINA: Guangdong:** Huizhou City, Longmen County, Nan-kunshan Nature Reserve, along the road at the foot of mountain, 565 m altitude, 14 May 2013, Tong Yi 13051455 (IBSC); Zhaoqing City, Fengkai County, Heishiding Nature Reserve, under broad-leaved forests mix with bamboo forest, ca. 570 m altitude, 31 May 2013, Tong Yi et al. 13053129 (IBSC).

**Habitat and ecology:** Under broadleaved forests mix with bamboo forest or secondary broadleaved forests. Flowering from May to early June and fruiting from May to June.

**Distribution:** Restricted in Guangdong and Taiwan, China.

**Notes:** The *Gastrodia albida* complex (*G. albida* T. C. Hsu & C. M. Kuo, *G. albidoides* Y. H. Tan & T. C. Hsu and *G. theana* Averyanov<sup>[19]</sup>) are easily distinguished by dwarf habits, whitish and scarcely opening flowers, curved and fleshy perianth tubes, hardly connate lateral sepals and a relatively short column and lip from the *Gastrodia* congeners.

Averyanov, in 2005, firstly published *Gastrodia theana* from Vietnam distinguished by perianth tube with distinctly striate and verrucose throughout, cordate based lip and a well-developed rostellum<sup>[19]</sup> (shown in Averyanov 2005: Fig. 6g<sup>[19]</sup> and Averyanov 2011: Fig. 43<sup>[20]</sup>, although not described in the text<sup>[19]</sup>). Hsu & Kuo, in 2011, published *G. albida* from Taiwan Island characterized by its perianth tube with moderately verrucose throughout and without striate outside, larger free portions of the petals, truncate based lip and absence of a rostellum<sup>[14]</sup>. Hsieh's et al., in 2012, report the new record species of *G. theana* in Taiwan, China<sup>[21]</sup>, which was actually the misidentification of *G. albida* according to the description of “actually lacking in rostellum” and perianth tube with dorsal “longitudinal grooves” (Hsieh et al. 2011: Fig. 3)<sup>[21]</sup>. Tan et al., in 2012, published *G. albidoides* from



Fig. 1 *Gastrodia albida* T. C. Hsu & C. M. Kuo. A: Habitat; B: Flowering; C: Fruiting; D: Plant; E, Inflorescence. F: Flower, frontal view; G: Perianth tube; H: Flower, side view; I: Rhizome; J: Lip; K: Column, ventral view; L: Column, side view.

Yunnan, China, distinguished by an almost smooth perianth tube, moderately free portions of the lateral sepals, un-thickened petals, absence of a rostellum (shown in Tan et al. 2012: Fig. 1B & C<sup>[9]</sup>, although “a well-developed rostellum” described in the text) and distinct column foot<sup>[9]</sup>.

Within the *Gastrodia albida* complex, differences between them are subtle, especially *G. albida* and *G. albidoides*. Morphologically, *Gastrodia albidoides* differs *G. albida* by the slightly verrucose toward apex, otherwise smooth perianth tube (vs. distinctly verru-

cose throughout in later), lateral sepals adnate to 1/2 their length (vs. adnate to 1/5–1/6 their length), petals thin in texture (vs. fleshy), lip rounded at base (vs. truncate at base), distinct column foot (vs. either absent or obscure). Our comprehensive morphological studies of the two populations from Guangdong indicated that their key character (e.g. lip truncate at base and the absence of column foot) are well identical with *G. albida*. What is slightly different from the type of *G. albida* is the number of wart on perianth tube between them (perianth tube slightly

verrucose toward apex or otherwise smooth in former vs. distinct verrucose outside in later). Considering the number of wart on perianth tube should be an unstable quantitative character, herein we report the new record species of *G. albida* from mainland China. However, the morphological differences between the two species need to be further studied. The “distinct column foot” described and presented in the original material of *G. albidoides* was actually not that “distinct”. The lip base seems easily transitional from round to truncate. The “smooth perianth tube” of *G. albidoides*, the “slightly verrucose toward perianth tube apex” of the two population present here and the “distinctly verrucose perianth tube throughout” of *G. albida*, seems to form a continuous variation.

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