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Gastrodia shimizuana, a Newly Recorded of *Gastrodia* (Orchidaceae) in Taiwan

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ABSTRACT: A newly recorded species, *Gastrodia shimizuana* Tuyama, in Taiwan is described and illustrated. This species is apparently rare and was previously known in only few localities in Iriomote Island, the Ryukyu Islands. We recently found it in the mountains at Beixinzhuang at elevations from 300 to 350 meters in northern Taipei, Taiwan. Although the flower of *G. shimizuana* is somewhat structurally similar to that of *G. pubilabiata*, they are evidently different from each other in floral dimensions, petals and lip shapes, floral color and flowering seasons.

KEY WORDS: ***Gastrodia shimizuana*, Orchidaceae, New record, Taiwan, Rare species.**

INTRODUCTION

The genus *Gastrodia* R. Br. (Orchidaceae) is a mycoparasite distributed in temperate and tropical areas of Asia and neighboring regions. This is a little known genus and its number of species is uncertain, recent figures varying from 17 to 33, in addition the synonymy is uncertain (Seidenfaden and Wood, 1992; Kobayashi and Yukawa, 2001). One group of *Gastrodia*, represented by *G. verrucosa* Blumea (*G. verrucosa* group), has inflorescences of only 3-15 cm in flower but 30-40 cm in fruit with elongated pedicels. Plants of this group are rarely found in flower therefore have not been studied intensively. Six species of Taiwanese *Gastrodia* belong to this group: *G. appendiculata*, *G. confusa*, *G. fontinalis*, *G. gracilis*, *G.. pubilabiata* and *G shimizana* (Leou, 2000).

G. shimizuana was described in a collection from Iriomote Island, the Ryukyu Islands by D. Shimizu in 1981. Although some fruits of *Gastrodia* were observed near the type locality, no further collections have been made since then, until 2000, Kobayashi and Yukawa found flowers of *G. shimizuana* on Iriomote Island (Kobayashi and Yukawa, 2001). On March 23, 2004 and 2005, we found plants of a species of *Gastrodia* flowering at mountain slope of Beixinzhuang, at elevation of 300-350 m, northern of Taipei City. The characteristics of these plants generally agree with the description of *G. shimizuana* (Tuyama, 1982; Kobayashi and Yukawa, 2001).

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TAXONOMIC TREATMENT

Gastrodia shimizuana Tuyama Acta Phytotax. Geobot. 33: 380-382. 1982; Kobayashi and Yukawa, Acta Phytotax. Geobot. 52(1): 49-55. 2001. 清水氏赤箭 Figs. 1 & 2

Rhizome tuberous, cylindrical, sparsely pubescent, 5-9 cm ling, 5-8 mm thick, with deltoid sheaths and nodes. Inflorescence erect, 2-5 cm long, rachis 1-1.5 cm, with short tubular sheaths, raceme condensed, bearing 1-4 nearly tufted flowers; floral bract broadly ovate, persistent, 5-7 mm long. Flowers campanulate, yellowish brown, 1.5-1.8 cm across; pedicel and ovary 8-10 mm long, with small papilla; sepals light yellowish brown, connate into a tube forming an obscure mentum, abaxial surface more or less verrucose, adaxial surface smooth, margins entire or crisped, semi-limpid, trilobed at apex, free lobes spreading, lobes 7-8 mm, tubular part 4-6 mm long, 4-6 mm wide. Dorsal sepal 9-10 mm ling, 3-nerved, emarginated; free part widely ovate, spreading, 5-6.5 mm long, 5.5-6.3 mm wide. Lateral sepals, light yellowish brown, 1.2-1.3 mm long, 4-nerved, obtuse; free part widely ovate, spreading, 4.5-5.0 mm long, 5-6 mm wide. Petals light yellowish brown, adnate to the calyx tube, 1-nerved, margins entire or crisped, surfaces smooth, sometimes verrucose on abaxial side; free part orbicular or widely ovate, obtuse, 3.0-3.5 mm long, 3.0-3.5 mm wide. Lip clawed, margins entire, 3-loved, 8-nerved, 5.0-6.0 mm long exclusive of claw; claw quadrate or widely obovate, 2.5-2.8 mm wide adnate to base of sepal tube, lateral lobes semiorbicular to deltoid 3.2-3.5 mm long, 4.8-5.0 mm wide when expanded, basal 3/4 orange, cream toward apex, adaxial surface pubescent, with longer hairs apically, abaxial surface smooth or papillate,

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Fig. 1. Habitat of *Gastrodia shimizuana*.

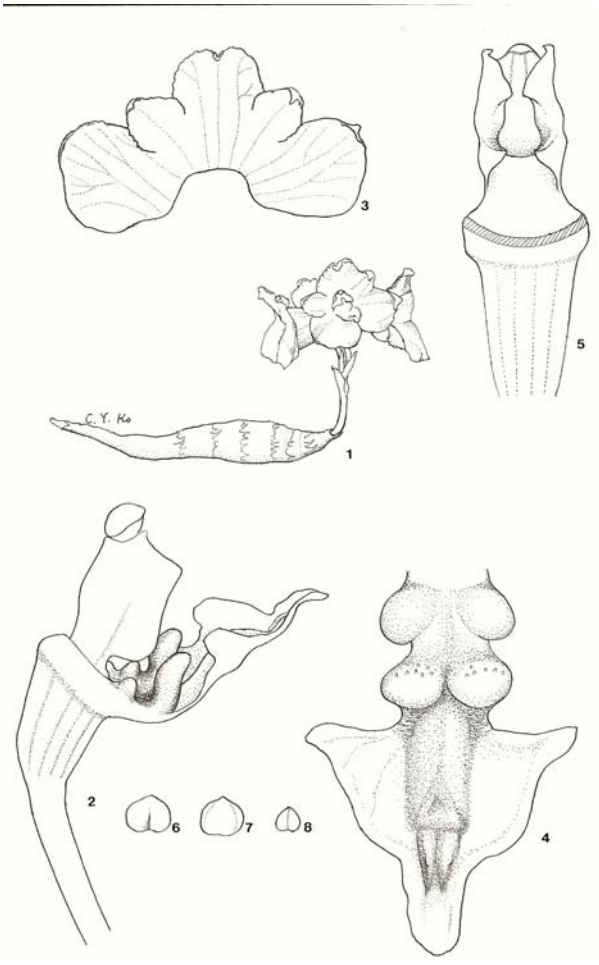


Fig. 2. *Gastrodia shimizuana* 1: Habit. 2: Column and lip, side view (perianth tube removed). 3: Perianth tube, dissected and extended. 4: Lip. 5: Column. 6: Anther. 7: Anther. 8: Pollinia.

midrib furrowed; midlobe quadrate, glabrous, cream, 2.0-2.1 mm long, 0.9-1.0 mm wide when expanded; with keel 1 in middle, a pair of small elevated keels near the tip, deltoid in side view, provided with 2 globose calli, collateral on adaxial side of claw of lip, sparsely papillate. Column straight, shorter than lip, 4.0-5.0 mm long inclusive of column foot, yellowish brown; lateral wings truncate, incurved above middle, forming an acute tooth on either side of apex, dilated toward base; stigma borne near middle; column foot distinct, provided with a pair rounded calli; anther cap ovoid, 1.3-1.5 mm long, 1.1-1.4 mm wide; Capsule cylindrical, peduncle and ovary very elongate in fruiting.

Flowering season: March.

Distribution: Northern Taipei City, Taiwan and Iriomote Island, Ryukyu, Japan.

Specimen examined: Taipei City: Sanzhi Hsiang, Beixinzhuang, Yangmingshan National Park, along the upper stream of the Datun Stream, 25°12'16.4" N, 121°31'22.2"E, elev. ca. 300-350 m, associated with *Citrus reticulata*, *Oreocnide pedunculata*, *Gonostegia hirta*, *Ophiorrhiza japonica*, *Strobilanthes cusia*, *Drymaria diandra*, *Arisaema ringens*, *Zeuxine nervosa*, *Gynostemma pentaphyllum*, *Elatostema lineolatum var. major*, *Arachniodes rhomboids*, *Athyriopsis japonica*, pathside, quite shade forest where the soil is reasonably fertile, March 23, 2005, *Chung & Hsu 8006* (TAIF).

DISCUSSION

Drosophila sp. were found inside the flowers of *Gastrodia shimizuan*, but the role they may have as pollinators is undetermined.

Our collection differs in lip with one keel in the middle (vs. two kells) and the margins are entire (vs. ciliate) from Irimote Island material. The differences

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are relatively minor and may represent intraspecific variation.

Gastrodia shimizuana though has flower structure somewhat similar to *G. pubilabiata*, it is clearly distinct in having a free part of dorsal sepal spreading (vs. porrect), a free part of petals widely ovate (vs. ovate-lanceolate), a lip blade semiorbicular or deltoid (vs. rhombate), the column shorter than the lip (vs. longer than lip), flowers yellowish brown (vs. dark brown), and flowering in March (vs. December).

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臺灣新記錄蘭科植物－清水氏赤箭

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摘　　要

本文發表一種臺灣蘭科新記錄植物－清水氏赤箭 (*Gastrodia shimizuana* Tuyama)，並提供植物繪圖及照片以資辨識。它是非常稀有的植物，以往僅發現於琉球西表島的少數地方，我們最近在臺灣北部的北新庄地區，海拔約三百至三百五十公尺的地方發現它的植株。雖然它的花部構造略似臺灣原產的冬赤箭（*G. pubilabiata*），但藉花部的尺寸大小、花瓣和唇瓣的形狀、花色及花期等特徵，明顯可與冬赤箭區別。

關鍵詞：清水氏赤箭、蘭科、新記錄、臺灣、稀有植物。

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