

Orchid Flora of Hong Kong: the addition of *Crepidium bahanense*

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Abstract: *Crepidium bahanense* (Hand.-Mazz.) S.C.Chen & J.J.Wood is reported from Hong Kong (China) for the first time. It was known earlier from Yunnan (China) and Loei (Thailand). Information on type, morphological description, flowering phenology, habitat and conservation assessment is provided for the species. This brings the total number of documented wild orchids in Hong Kong to 142 taxa, including two more orchids that are yet to be identified.

Keywords: China, Indo-Myanmar Biodiversity Hotspot, Malaxidinae, Orchidaceae.

Introduction

Hong Kong has an orchid flora consisting of 142 taxa including one unidentified species each belonging to genera *Dendrobium* Sw. and *Gastrodia* R.Br. In continuation with the previous new records and new species (Kumar *et al.*, 2014, 2022; Kumar & Gale, 2020, 2022, 2023), yet another species is added here to the orchid flora of Hong Kong, *i.e.*, *Crepidium bahanense* (Hand.-Mazz.) S.C.Chen & J.J.Wood, bringing the total count of orchid richness in Hong Kong to 140 taxa.

Crepidium bahanense was originally described from Yunnan (China) as *Microstylis bahanensis* Hand.-Mazz. and later transferred to the genus *Malaxis* Sol. ex Sw. as *M. bahanensis* (Hand.-Mazz.) Tang & F.T.Wang, followed by transfer to the genus *Crepidium* Blume as *C. bahanense* (Handel-Mazzetti, 1936; Tang & Wang, 1951, Chen & Wood, 2009; Zhou *et al.*, 2016). Nuammee *et al.* (2016) reported this species for the first time from Thailand. While new concepts have been proposed for the generic classification of the genus *Crepidium* (Cameron,

2005; Margonska *et al.*, 2012; Kumar *et al.*, 2022), these have not yet been universally accepted, hence, the currently accepted name is used in this manuscript.

Taxonomic Treatment

Crepidium bahanense (Hand.-Mazz.) S.C.Chen & J.J.Wood, Fl. China 25: 232. 2009. *Malaxis bahanensis* (Hand.-Mazz.) Tang & F.T.Wang, Acta Phytotax. Sin. 1: 71. 1951. *Microstylis bahanensis* Hand.-Mazz., Symb. Sin. 7: 1350, t. 42, 6–7. 1936. *Type:* CHINA, **Yunnan**, Bahan (Pehalo), in the grasses near Salween River, 21.07.1916, *Handel-Mazzetti* 9574 (holo WU [WU0061601!]). **Fig. 1**

Terrestrial leafy herbs, 8–13 cm tall, with homoblastic corms placed on ground or partly covered in debris. Corms globose to sub-globose, 0.9–1 cm in diam., multi-noded, vermiform tufted roots emerging from the lower part, upper part bearing leaves. Leaves 2, coriaceous, green; lamina ovate to oblong-lanceolate, 3–3.5 × 1–1.3 cm, obtuse to acute at apex, slightly undulate at margin, dark green above, pale green below, 3-veined, veins prominently dark green underneath; petiole amplexicaule, 1.8–2 × 0.02–0.03 cm. Inflorescence erect, emerging from the apex of the corm in the middle of two leaves, 8–9 cm tall, keeps growing till the last flower opens, strongly ridged, green with reddish-brown markings, lower part with up to 8 sterile bracts, upper part with up to 18 flowers. Floral bracts triangular, 0.3–0.4 × c. 0.01 cm wide, acuminate at apex, strongly reflexed downwards. Pedicel-with-ovary clavate, 0.15–0.2 cm long, strongly ribbed, green. Flowers fully open, non-resupinate, laxly placed, 0.3–0.4 cm long, slightly shorter in width; sepals, petals and labellum

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yellowish green with reddish brown markings towards the apices. Dorsal sepal ovate, up to 2 mm long, *c.* 1.5 mm wide, acute at apex, margin strongly reflexed backwards; lateral sepals slightly shorter and broader, margin slightly reflexed backwards. Petals linear, *c.* 2 × 0.2 mm, acute at apex, margin slightly reflexed backwards. Labellum oblong, *c.* 4 mm long, 3-lobed with distinct notches distinguish mid-lobe and side lobes; side lobes falcate, *c.* 1.5 mm long, acute at apex, bend downwards, arching under the column with apices of both lobes parallel on either side of the column in fresh flowers, overlapping each other towards the apex in mature flower; mid-lobe erect, 2–2.5 × *c.*

2.5 mm, proximally bilobulate, with a prominent groove at the top, lobes quadrangular in outline, truncate at apices, central disc above the column raised with orbicular rim and an ovate cavity above the column base. Column short, stout, *c.* 1 × 0.5 mm, with stelids projecting forwards from either side of the stigmatic cavity; stelidia linear, *c.* 0.5 mm long, apex retuse; clinandrium round; pollinia 4 in 2 pairs, each pair clavate, unequally lobed; anther-cap trapezoid, not covering the whole pollinia. Fruits not seen.

Flowering & fruiting: Plants were seen in flower in mid-June in Hong Kong, but in Yunnan, where the

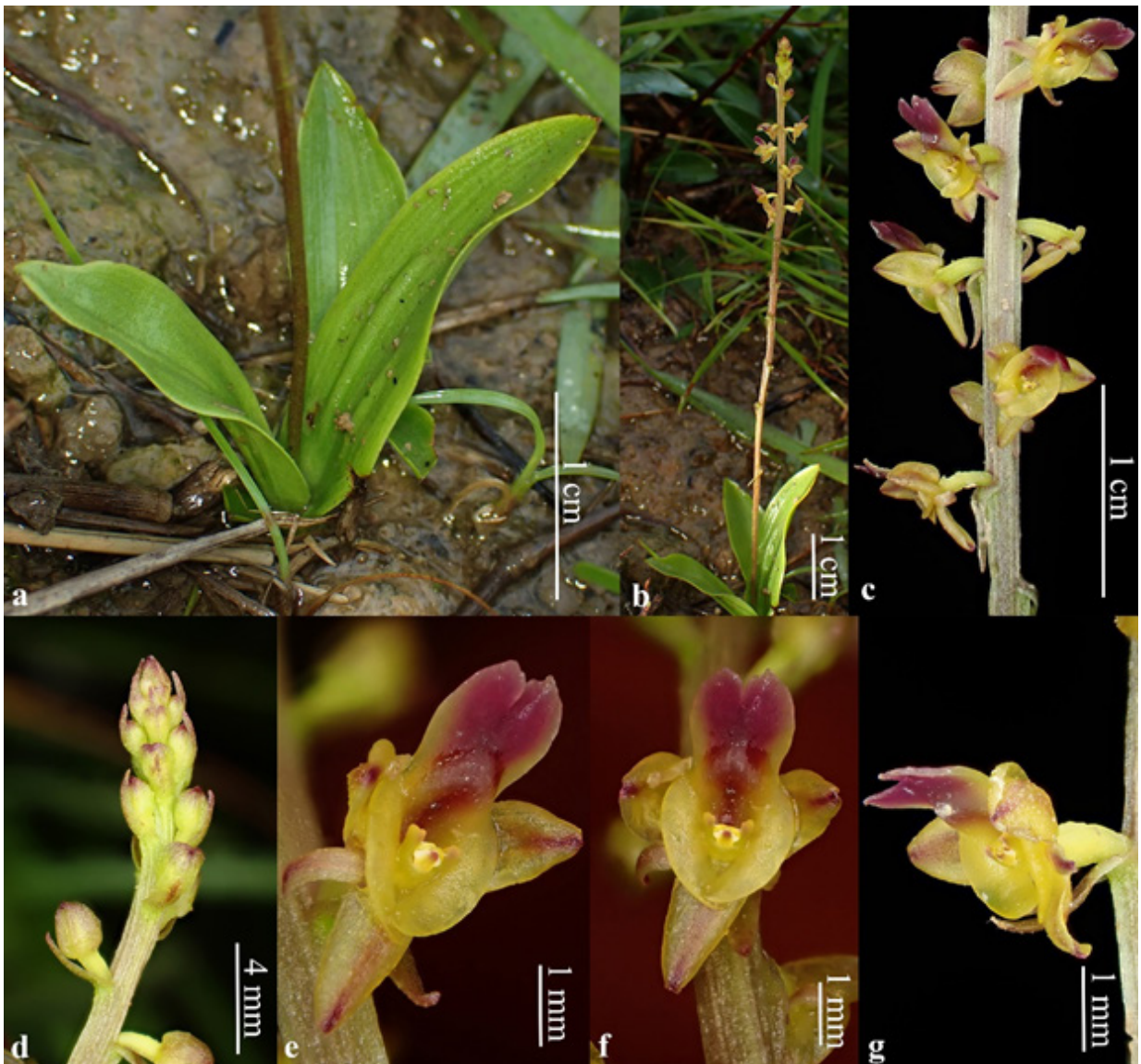


Fig. 1. *Crepidium bahanense* (Hand.-Mazz.) S.C.Chen & J.J.Wood.: a. Close up of leaves; b. Plant in habitat; c. Close up of inflorescence; d. Close up of buds; e–g. Front and side views of fully open flowers (from Pankaj Kumar 12329; photos by Pilcher Ngai).

type specimen was collected, and in Loei (Thailand), plants flowered in June and July; fruiting not seen.

Habitat: In Yunnan, this species was found growing among *Pteridium* Gled. ex Scop. (Dennstaedtiaceae) in grasslands on shale rocks in a hot temperate area at an elevation of around 2,600 m (Chen & Wood, 2009). In Hong Kong, two individual plants were found growing together on exposed, short-heighted grasslands at an elevation of around 400 m. In Thailand, the plants were found growing in sandy soil along streams and shallow, moist depressions in open grassland at an elevation of around 1,200 m (Nuammee *et al.*, 2016).

Specimens examined: *Crepidium allanii*: CHINA, **Hong Kong**, Hong Kong Island, Repulse Bay, 25.03.1975, S.Y.Hu 13551 (holo, CUHK!; iso, K [K00094281!]); 1983, OM 9 (KFBG [KFBG14345!]); 15.03.2019, Pankaj Kumar KFBG 4611 (KFBG [KFBG14484!]); Hong Kong Island, Tai Tam catchment, 19.06.1999, Y.S.Lau 2993 (HK [HK33337!]). *Crepidium bahanense*: CHINA, **Hong Kong**, New Territories, open hilltop grasslands, 400 m, 20.06.2023, Pankaj Kumar 12329 (HK!-only photographs). *Crepidium purpureum*: CHINA, **Hong Kong**, New Territories, Tai Mo Shan, 18.07.2013, Pankaj Kumar 12243 (KFBG!); New Territories, Tai Mo Shan, 08.11.1972, S.Y. Hu 12449(A) (CUHK); *Ibid.*, 01.06.1969, Y.S. Lau 1494 (HK); New Territories, Hills of Tai Po Kau, 08.11.1972, S.Y. Hu 12451 (K!-yellow form); New Territories, Tai Mo Shan, North slope, 09.06.966, G. Barretto 2 (K). INDIA, **Khasi Hills**, *Lobb s.n.* (K!).

NEPAL, Ganesh Himal, Sathigaon, 1919, Jordan & Lachard 847263 (K!).

Conservation assessment: *Crepidium bahanense* was originally recorded from Yunnan in 1936 (Handel-Mazzetti, 1936) and later reported from Thailand (Nuammee *et al.*, 2016). Hence, its occurrence in Hong Kong was unexpected, as the new site in Hong Kong is about 1400 km away from the other two sites and is located at a much lower elevation. Only two plants were seen to occur at a single site, and multiple attempts to find more individuals went in vain. However, owing to the green-coloured leaves, it is highly probable that the plants were hiding among the green grasses. Also, there is a high chance of occurrence of more individuals of this species in Hong Kong and adjoining areas. As it is a recently discovered species, more surveys and studies would be needed to do a regional assessment, hence the species is assessed here regionally as Data Deficient. At global scale, the Area of Occurrence (AOO) and Extent of Occurrence (EOO) is estimated using GeoCAT (Bachman & Moat, 2012) as 12 km² and 784,791 km² respectively. In Hong Kong, hikers, local enthusiasts and poachers go looking out for orchids and while doing so some of them not only disturb the habitat but also collect orchids for horticultural use. This species grows in grassland habitats with a threat of hill fire. Owing to such disturbances, the three sites in China (Yunnan and Hong Kong) and Thailand are treated as three locations following IUCN guidelines (IUCN Standards and Petitions



Fig. 2. Comparison of three species of *Crepidium* found in Hong Kong.: a. *Crepidium allanii* (S.Y.Hu & Barretto) Kumar & S.W.Gale; b. *C. bahanense* (Hand.-Mazz.) S.C.Chen & J.J.Wood; c. *C. purpureum* (Lindl.) Szlach.; d. *C. cordilabium* T.P.Lin (photos a, c & d by Pankaj Kumar, b by Pilcher Ngai).

Table 1. Comparison of three species of *Crepidium* found in Hong Kong.

Characters	<i>C. allanii</i> (S.Y.Hu & Barretto) Kumar & S.W.Gale	<i>C. bahanense</i> (Hand.-Mazz.) S.C.Chen & J.J.Wood	<i>C. cordilabium</i> T.P.Lin	<i>C. purpureum</i> (Lindl.) Szlach.
Plant height	Up to 20 cm	< 15 cm	Up to 60 cm	Up to 30 cm
Leaves	Plicate, up to 8 cm long, acute at apex	Non-plicate, < 5 cm long, obtuse to acute at apex	Plicate, up to 20 cm long, acute at apex	Plicate, up to 20 cm long, acute at apex
Leaf margin	Undulate	Smooth or rarely undulate	Undulate	Undulate
Inflorescence length	< 10 cm	< 10 cm	Up to 40 cm long	Up to 30 cm long
Flowers	<i>c.</i> 1 × 1 cm	<i>c.</i> 0.4 × 0.4 cm	<i>c.</i> 0.7 × 0.7 cm	<i>c.</i> 1 × 1 cm
Labellum	<i>c.</i> 1 cm long; mid-lobe shallowly notched at - apex, margin denticulate with rounded outline, no constriction between side lobes and mid-lobe	<i>c.</i> 0.4 cm long; mid-lobe deeply notched at the apex, lobule margin truncate with quadrangular outline, deep constriction between side lobes and mid-lobe	<i>c.</i> 0.3 cm long; mid-lobe not notched but rounded at the apex, no constriction between side lobes and mid-lobe	<i>c.</i> 0.8 cm long; mid-lobe deeply notched at the apex, lobule margin smooth with elliptic outline, shallow constriction between side lobes and mid-lobe
Column	<i>c.</i> 2 mm long; staminode ovate with acute apex, up to 1.2 mm long	1 mm long; staminode linear with retuse apex, up to 0.5 mm long	<i>c.</i> 1.5 cm long, staminode falcate with acute apex, 0.5 cm long	1 mm long; stelia ovate with acute apex, up to 0.5 mm long

Committee, 2022). The total number of mature plants in Hong Kong so far is two, however, the population size is not known at the other two sites. Based on available information, this species can be assessed on the global level as Endangered [EN B2a(iii)] following IUCN guidelines (IUCN Standards and Petitions Committee, 2022).

Notes: *Crepidium bahanense* can be easily distinguished from the other two members of this genus native to Hong Kong: *C. allanii* (S.Y.Hu & Barretto) Kumar & S.W.Gale and *C. purpureum* (Lindl.) Szlach. In comparison, *C. bahanense* has smaller (≤ 5 cm long, in comparison to more than 7 cm long in the other two) non-plicate leaves (plicate in other two) and labellum mid-lobe lobules with truncate apices (lobule rounded in

C. allanii and ovate in *C. purpureum*) (please also see Fig. 2 and Table 1). While, the fourth native Hong Kong member *Crepidium cordilabium* T.P.Lin is very distinct from the rest in size and morphology owing to its unnotched mid-lobe.

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Literature Cited

- BACHMAN S. & J. MOAT 2012. GeoCAT -An open-source tool for rapid red list assessments. *BGjournal* 9(1): 11–13. <https://www.jstor.org/stable/24811237>
- CAMERON K.M. 2005. Leave it to the leaves: a molecular phylogenetic study of Malaxideae (Epidendroideae, Orchidaceae). *American Journal of Botany* 92(6): 1025–1032. <https://doi.org/10.3732/ajb.92.6.1025>
- CHEN X. & J.J. WOOD 2009. *Crepidium* Blume. In: WU Z.Y., RAVEN P.H. & D.Y. HONG (eds.). *Flora of China* 25. *Orchidaceae*. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis.
- HANDEL-MAZZETTI H.F. VON 1936. *Symbolae sinicae: Botanische Ergebnisse der Expedition der Akademie der Wissenschaften in Wein nach Südwest-China, 1914–1918*. J. Springer, Wien.
- IUCN 2022. *Guidelines for using the IUCN Red List Categories and Criteria*. Version 15.1. Prepared by the Standards and Petitions Committee. Available at: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf> (Accessed on 18.09.2023).
- KUMAR P. & S.W. GALE 2020. *Anoectochilus formosanus* (Orchidaceae), a new record for Hong Kong. *Rheedea* 30(2): 293–296. <https://dx.doi.org/10.22244/rheedea.2020.30.02.06>
- KUMAR P. & S.W. GALE 2022. Taxonomic notes on *Apostasia nipponica* and *Crepidium cordilabium* (Orchidaceae), two species newly recorded from Hong Kong. *Feddes Repertorium* 133(3): 1–17. <https://doi.org/10.1002/fedr.202200002>
- KUMAR P. & S.W. GALE 2023. *Cheirostylis yunnanensis* var. *gloriae*, an interesting new caterpillar orchid from Hong Kong, China. *Feddes Repertorium* 134(3): 181–190. <https://doi.org/10.1002/fedr.202200052>
- KUMAR P., LI J. & S.W. GALE 2022. Integrative analyses of *Crepidium* (Orchidaceae, Epidendroideae, Malaxideae) shed more light on its relationships with *Dienia*, *Liparis* and *Malaxis* and justify reinstatement of narrow endemic *C. allanii*. *Botanical Journal of Linnean Society* 198(3): 285–305. <https://doi.org/10.1093/botlinnean/boab048>
- KUMAR P., GALE S.W., KOCYAN A., FISCHER G.A., AVERYANOV L., BOROSOVA R., BHATTACHARJEE A., LI J. & K.S. PANG 2014. *Gastrochilus kadooriei* (Orchidaceae), a new species from Hong Kong, with notes on allied taxa in section *Microphyllae* found in the region. *Phytotaxa* 164(2): 091–103. <https://dx.doi.org/10.11646/phytotaxa.164.2.3>
- MARGOŃSKA H.B., KOWALKOWSKA A.K., GÓRNIAK M. & P. RUTKOWSKI 2012. *Taxonomic redefinition of the subtribe Malaxidinae (Orchidales, Malaxideae)*. Koeltz Scientific Books, Koenigstein.
- NUAMMEE A., SEELANAN T., SUDDEE S. & H.Æ. PEDERSEN 2016. Notes on *Crepidium* (Orchidaceae): two new combinations, a putative natural hybrid, and four species newly recorded for Thailand. *Thai Forest Bulletin (Botany)* 44(1): 35–44; <https://doi.org/10.20531/tfb.2016.44.1.08>
- THAWATCHAI S., LARSEN K., PEDERSEN H.Æ., KURZWEIL H., SUDDEE S. & P.J. CRIBB 2022. *Flora of Thailand* 12, *Orchidaceae* 3. The Forest Herbarium, Royal Forest Department.
- TANG T. & F.T. WANG 1951. Contributions to the knowledge of Eastern Asiatic Orchidaceae II. *Acta Phytotaxomica Sinica* 1(1): 23–102. <https://www.jse.ac.cn/EN/Y1951/V1/I1/23>
- ZHOU X., CHENG Z., LIU Q., ZHANG J., HU A., HUANG M., HU C. & H.Z. TIAN 2016. An updated checklist of Orchidaceae for China, with two new national records. *Phytotaxa* 276(1): 1–148. <https://doi.org/10.11646/phyto-taxa.276.1.1>