Gardens' Bulletin Singapore 77(2): 179–184. 2025
doi: 10.26492/gbs77(2).2025-02

Didymoplexis micradenia (Orchidaceae), a new record of a mycoheterotrophic orchid in Singapore

M.A. Niissalo[1], C.M. Boo[2], M. Hroneš[3], W.H. Lim[1], C. Bandara[4], A.-Q. Hu[5], J. Leong-Škorničková[1,6] & Ali bin Ibrahim[1]

[1]Botanical Research, National Parks Board,
1 Cluny Road, Singapore 259569, Singapore
Matti_Asser_Niissalo@nparks.gov.sg
[2]Unaffiliated
[3]Department of Botany, Palacký University, Šlechtitelů 27,
CZ-77900 Olomouc, Czech Republic
[4]Faculty of Graduate Studies, University of Sri Jayewardenepura,
Gangodawila, Nugegoda 10250, Sri Lanka
[5]Shenzhen Key Laboratory for Orchid Conservation and Utilization,
National Orchid Conservation Centre of China and
Orchid Conservation & Research Centre of Shenzhen, Shenzhen 518114, China
[6]Department of Biological Sciences, National University of Singapore,
16 Science Drive 4, Singapore 117558, Singapore

ABSTRACT. *Didymoplexis micradenia* (Rchb.f.) Hemsl. is newly recorded from Singapore. The species is widespread in Asia and Oceania, with a notable increase in recorded range in recent years. We consider this species native to Singapore. This is also a new generic record for Singapore, as all previous records of the related *Didymoplexis pallens* Griff. from Singapore have now been reidentified as *Gastrodia queenslandica* Dockrill.

Keywords. Central Catchment Nature Reserve, conservation assessment, native, new species record, Pulau Ubin

Introduction

Didymoplexis micradenia (Rchb.f.) Hemsl. is a small-flowered, somewhat inconspicuous mycoheterotrophic herb. Multiple names of previously described taxa, all with minute denticulation at the outer edge of an obtriangular labellum, have been synonymised under this name. The species therefore has a complex taxonomic and geographic history. It was first described from Fiji (Seemann, 1868), with synonyms from New Guinea (*Didymoplexis papuana* Schltr.; Schlechter, 1914), Ambon (*D. minor* var. *amboinensis* J.J.Sm.; Smith, 1917), Java (*D. minor* J.J.Sm.; Smith, 1900; Mustaqim et al., 2017), Samoa (*D. minor* subsp. *samoensis* H.Fleischm. & Rech.; Rechinger, 1910), Palau (*D. fimbriata* Schltr.; Schlechter, 1921), Talaud Islands (*D. minor* var. *salmonea* J.J.Sm.; Smith, 1930) and New Caledonia (*D. neocaledonica* Schltr., Schlechter, 1906). The synonyms were treated by Lewis & Cribb (1989),

and indeed this taxon is remarkably uniform considering the wide distribution range. In recent years it has been recorded from Taiwan (Hsu & Chung, 2007), Thailand (Phuekkhlai et al., 2014; Suddee & Chantanaorrapint, 2014), Australia (Gray, 2017) and Peninsular Malaysia (Ong et al., 2020), dramatically expanding its known range. It is also recorded from the Philippines (Pelser et al., 2011 onwards), Tonga (Cribb & Whistler, 2011), Niue (Cribb & Whistler, 2011), Wallis and Futuna (*Pillon 972* [NOU085924]), Vanuatu (Lewis & Cribb, 1989), American Samoa (Whistler, 1994), Mariana Islands (Raulerson & Rinehart, 1992), and there is an unconfirmed record from Vietnam (Hsu & Chung, 2007; Averyanov, 2011).

We encountered this species in Singapore three times: in 2010, 2020 and in 2025. The earliest collection (*Ali bin Ibrahim SING2010-776*) is of fruiting material only. It was initially identified as *Lecanorchis*, but it bears a very elongated pedicel typical of certain species in Gastrodieae. It was later identified as *Didymoplexis pallens*, as that was the only species listed in Singapore with elongated pedicels, at the time. Later, we discovered that all previous specimens of *Didymoplexis pallens* were misidentified (see Niissalo et al., 2025), and the identity of the recent specimen only became clear when further material was discovered in flower. The other collections were in flower, and *Olimpos SING2025-108* bears both flowers and fruits.

Didymoplexis micradenia is easily separated from *D. pallens* by the denticulation at the apical edge of the labellum. These teeth give *Didymoplexis micradenia* the epithet (small teeth), and they are absent in *D. pallens*. We have not seen reliably identified fruiting specimens of *Didymoplexis pallens* for a thorough comparison of fruit characters. However, the only fruit-only specimen of *Didymoplexis micradenia* (*Ali bin Ibrahim SING2010-776*) differs in no way from the confirmed *D. micradenia*, *Olimpos SING2025-108*, and we consider all materials from Singapore to be conspecific. *Didymoplexis pallens* may have thicker and possibly longer pedicels, and wider placentiferous valves in the split capsule than *D. micradenia*, but these observations are based on a few photographs only.

In Singapore, the species occurs in small numbers in thick leaf litter. All three localities in Singapore are in secondary forests. *Leong-Škorničková et al. SING2019-061* was collected from a discontinued rubber plantation at the boundary of the Central Catchment Nature Reserve, and *Ali bin Ibrahim SING2010-776* was collected from a mature secondary forest on Pulau Ubin. The flowers seem to be short-lived, as they degrade soon after collection.

The geographical breadth of the recent collections could be suggestive of recent spread, but it seems more likely that the species has simply gone under-detected due to small, ephemeral flowers, difficulty in detecting the plant between flowering, and similarity of fruiting plants to *Didymoplexis pallens*.

Taxonomic treatment

Didymoplexis micradenia (Rchb.f.) Hemsl., J. Linn. Soc., Bot. 20: 311 (1883). *Epiphanes micradenia* Rchb.f., Fl. Vit. [Seemann]: 295 (1868). – TYPE: Fiji, 1860,

Seemann 610 (lectotype W [W48230, n.v.], designated by Cribb & Whistler, Orchids Samoa: 46 (1996); isolectotype K [K000942690, n.v.]). (Figs 1, 2)

[The description is based on Singapore material only.]

Herb, a terrestrial, leafless, mycoheterotroph. ***Rhizome*** tuberous basally, non-tuberous apically, c. 5 cm long, tuberous part c. 3.5–4 cm long, 5–7 mm diam., light brown, with sparse bracts, glabrous, non-tuberous part 1–3 cm long; scales poorly preserved, apparently amplexicaul, thin and membranaceous, deeply lobed to resemble multiple verticillate scales, lobes broad, c. 1 mm long, pale yellowish brown. ***Roots*** few, slender, often extending from apex of rhizome, to 10 cm long, budding secondary rhizomes. ***Inflorescence*** 12–17 cm long (excluding elongated pedicels), 2–5-flowered, glabrous. ***Peduncle*** erect, 10–15 cm long, 1.5–2 mm diam., pale brown, 2–3-noded, with small triangular membranous sheaths, 2–3 × c. 3 mm when flattened. ***Rachis*** 2–4 cm, light brown; floral bracts membranous, triangular, c. 1 × 1 mm, pale brown. ***Pedicel and ovary*** 7–10 mm long, smooth and glabrous, light brown, ovary c. 1.5 mm diam., pedicel c. 1.5 mm long, c. 1 mm diam. ***Flowers*** resupinate to upright, very fragile, urceolate to narrowly campanulate, white. Sepals and petals forming a perianth tube, c. 8 cm long, c. 6.5 mm wide, dorsal sepal and petals connate to 3 mm from the base of the perianth tube, lateral sepals connate to 3 mm length, lateral sepals connate to petals to 2.5 mm from the base of the perianth tube, fertile bracts medium brown, triangular to broadly elliptic, acute, c. 1.5 × 1.5 mm. ***Sepal and petal lobes*** similar size and shape, 3-veined, white adaxially, with slightly brownish veins, very light brown abaxially, with a slightly irregular abaxial surface, elliptic, obtuse, flat, glabrous; free part 1.5 mm (lateral sepals) to 2 mm long (petals and dorsal sepal). ***Lateral sepals and petals*** slightly curved down. ***Lip*** obtriangular, with fine dentation on the outer edge, adnate to column foot (adnate to perianth tube), white, c. 3 × 2.5 mm, with a tuft of papillae on the adaxial surface along three parallel midveins, except at the base; the three lines of papillae overlap and appear as a single mass, papillae salmon pink-orange. ***Column*** straight, c. 4 × 1.5 mm, white, apex with a pair of stelidia c. 0.5 mm long, horn-like, equal in length to anther; column foot minute (c. 0.5 mm long); rostellum apparently present but minute; stigma apical, very close to the pollinia. ***Anther*** minute, c. 0.4 × 0.25 mm, pollinia 2 or 4, with powdery pollen and resembling a single mass, not entirely covered below the anther cap; anther cap globular to rectangular. ***Capsule*** ellipsoid, with remnants of flower parts remaining at the apex, smooth, c. 2.5 × 0.8 cm, with a very elongated pedicel, 12–20 cm in ripe fruit (elongating late in fruit development). ***Seeds*** fusiform, 1.7–2 mm long, very thin.

Provisional IUCN conservation assessment. Globally, the species is very widespread, and probably occurs in large numbers of individuals. Given its ability to grow in secondary forest, it is unlikely to be in serious decline in most of the range, and it should be considered Least Concern (LC) according to the guidelines of the IUCN Standards and Petitions Committee (2024). In the national red list assessment of Singapore, the species should be considered Critically Endangered on account of having a population of fewer than 50 plants (Davison et al., 2024).

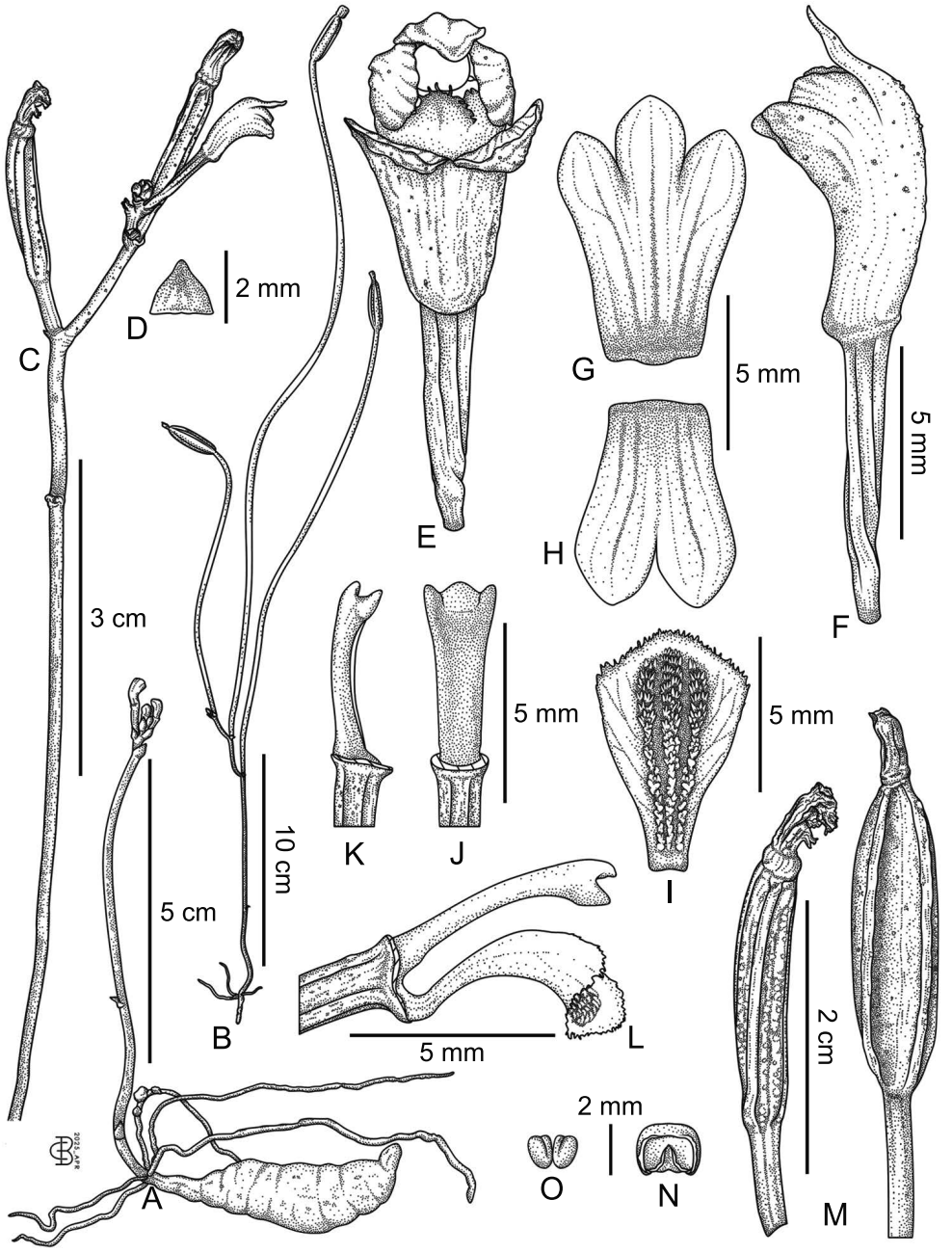

Fig. 1. *Didymoplexis micradenia* (Rchb.f.) Hemsl. **A.** Whole plant in bud. **B.** Fruiting plant with non-tuberous part of the rhizome. **C.** Inflorescence with developing fruits. **D.** Fertile bract. **E.** Flower, front view. **F.** Flower, side view. **G.** Fused dorsal sepal and petals. **H.** Fused lateral sepals. **I.** Lip. **J.** Column, lower view. **K.** Column, side view. **L.** Lip, column and column foot, side view. **M.** Fruits. **N.** Anther cap. **O.** Pollinia. A, B, D–M from *Olimpos SING2025-108*; C from *Leong-Škorničková et al. SING2019-061*. Drawn by Champika Bandara.

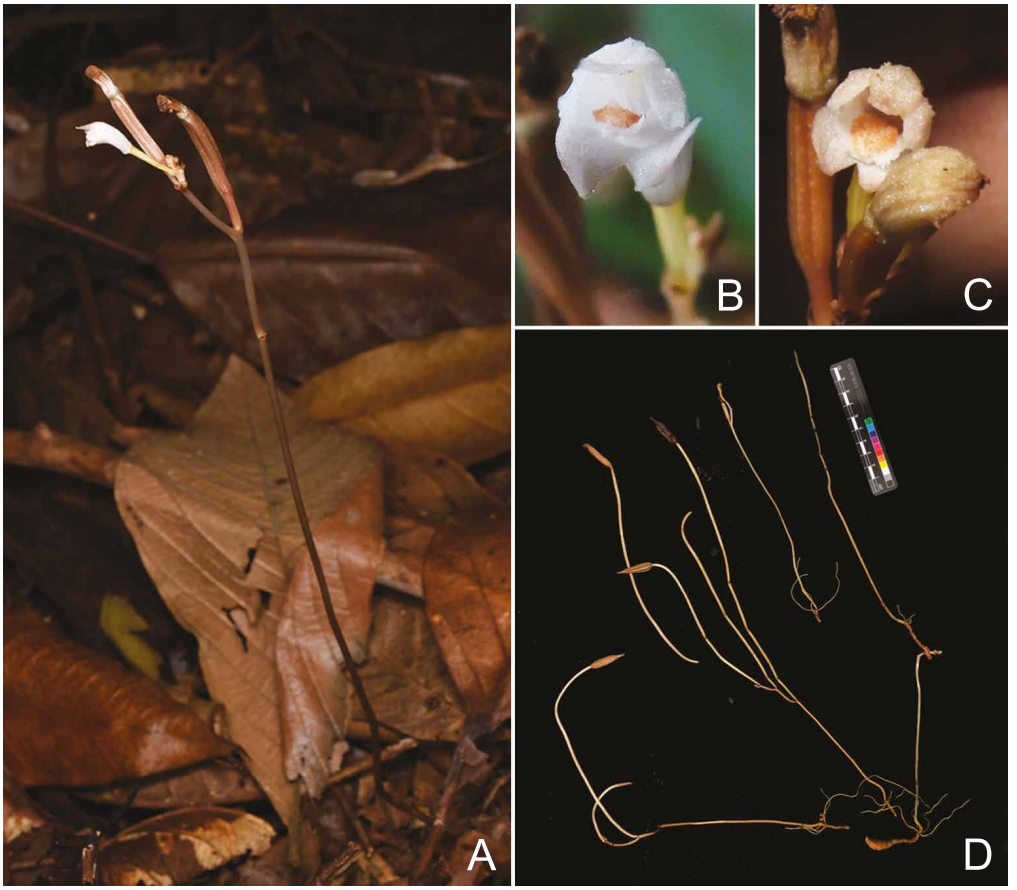

Fig 2. *Didymoplexis micradenia* (Rchb.f.) Hemsl. **A.** Flowering plant. **B, C.** Close-ups of flowers. **D.** Fruiting plants. A, B from *Leong-Škorničková et al. SING2019-061*; C from *Olimpos SING2025-096*; D from *Olimpos SING2025-108*. All from Singapore. (Photos: A, M. Hroneš; B, J. Leong-Škorničková; C, C.M. Boo; D, W.H. Lim)

Specimens examined. SINGAPORE: **Northern Singapore:** 1 Mar. 2025, *Olimpos SING2025-096* (SING [SING0403732]); ibidem, 8 Mar. 2025, *Olimpos SING2025-108* (SING [SING0403741]). **Old Thomson Road:** 4 Feb. 2020, *Leong-Škorničková et al. SING2019-061* (SING). **Pulau Ubin:** 21 Jan. 2010, *Ali bin Ibrahim SING2010-776* (SING [SING0146653]).

References

Averyanov, L.V. (2011). The orchids of Vietnam illustrated survey, pt. 3, subfamily Epidendroideae (primitive tribes – Neottieae, Vanilleae, Gastrodieae, Nervilieae). *Turczaninowia* 14(2): 15–100.

Cribb, P.J. & Whistler, W.A. (2011). The orchids of Tonga, Niue and the Cook Islands. *Lankesteriana* 11(2): 99–177.

Davison, G.W.H., Gan, J.W.M., Huang, D., Hwang, W.S., Lum, S.K.Y. & Yeo, D.C.J. (eds) (2024). *The Singapore Red Data Book: Red Lists of Singapore Biodiversity*, 3rd ed. Singapore: National Parks Board.

Gray, B. (2017). *Didymoplexis micradenia* (Rchb.f.) Hemsl. (Orchidaceae): A new record for the Australian flora. *Austrobaileya* 10(1): 200–204.

Hsu, T.C. & Chung, S.W. (2007). *Didymoplexis micradenia*: A newly recorded orchid (Orchidaceae) in Taiwan. *Taiwania* 52(4): 360–364.

IUCN Standards and Petitions Committee (2024). *Guidelines for Using the IUCN Red List Categories and Criteria*, ver. 16. Prepared by the Standards and Petitions Committee. Available from: http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

Lewis, B. & Cribb, P. (1989). *Orchids of Vanuatu*. London, UK: Royal Botanic Gardens, Kew.

Mustaqim, W.A., Pradana, D.H., Saputra, R. & Hartanto, M. (2017). Recollection of *Didymoplexis micradenia* (Rchb. f.) Hemsl. (Orchidaceae) from Western Javan populations. *Trop. Pl. Res.* 4(2): 332–334.

Niissalo, M.A., Hu, A.Q., Ng, X.Y., Lim, R.C.J., Phoaiam, P., Gray, B., Teo, S.C., Neo, W.L., Tay, F.E.L., Suddee, S. & Khew, G.S. (2025). *Gastrodia queenslandica* (Gastrodieae, Epidendroideae, Orchidaceae) in Singapore and Thailand, first records in Asia. *Gard. Bull. Singapore* 77(2): 163–177.

Ong, P.T., Khew, R., Rafidah Abdul Rahman & Imin Kamin (2020). *Didymoplexis micradenia*, a new orchid record for Peninsular Malaysia and a critically endangered species from the cement quarry on Gunung Kanthan, Perak. *Malesian Orchid J.* 24: 39–44.

Pelser, P.B., Barcelona, J.F. & Nickrent, D.L. (eds) (2011 onwards). *Co's Digital Flora of the Philippines*. www.philippineplants.org. Accessed 2 Oct. 2025.

Phuekkhlai, O., Bunpha, K. & Tetsana, N. (2014). *Didymoplexis micradenia* and *Gastrodia theana* (Orchidaceae), new records for Thailand. *Thai Forest Bull.,Bot.* 42: 71–74.

Raulerson, L. & Rinehart, A.F. (1992). *Ferns and Orchids of the Mariana Islands*. Guam, USA: American Printing Corp.

Rechinger, K. (1910). Botanische und zoologische Ergebnisse einer wissenschaflichen Forschungsreise nach den Samoainseln, dem Neuguinea-Archipel und den Salomoninseln, III. Teil. *Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl.* 85: 175–432.

Schlechter, R. (1906). Beiträge zur Kenntnis der Flora von Neu-Kaledonien. *Bot. Jahrb. Syst.* 39(1): 1–274.

Schlechter, R. (1914). Die Orchidaceen von Deutsch-Neu-Guinea. *Feddes Repert. Spec. Nov. Regni Veg.* 1: 1–1042.

Schlechter, R. (1921). Die Orchideen von Mikronesien. *Bot. Jahrb. Syst.* 39(4): 1–274.

Seemann, B.C. (1868). *Flora Vitiensis*, pt. 9. London, UK: L. Reeve and Co.

Smith, J.J. (1900). Kurze Beschreibungen neuer, malaiischer Orchideen. *Bull. Inst. Bot. Buitenzorg* 7: 1–5.

Smith, J.J. (1917). The Amboina Orchidaceae collected by C.B. Robinson. *Philipp. J. Sci., C.* 12(5): 249–262.

Smith, J.J. (1930). On a collection of Orchidaceae from the Northern Moluccas. *Bull. Jard. Bot. Buitenzorg, sér. 3* 11: 67–81.

Suddee, S. & Chantanaorrapint, S. (2014). *Didymoplexis*. In: Satisuk, T. & Larsen, K. (eds), *Flora of Thailand,* vol. 12, pt. 2, pp. 484–489. Bangkok, Thailand: The Forest Herbarium.

Whistler, A.W. (1994). *Technical Report 87. Botanical Inventory of the Proposed Tutuila and Ofu Units of the National Park of American Samoa*. Honolulu, USA: University of Hawai'i at Manoa.