



Heterostemma carnosum (Apocynaceae, Asclepiadoideae), a new species from Papua New Guinea

Michele RODDA

Singapore Botanic Gardens, National Parks Board, 1 Cluny Road, Singapore, 259569, Singapore.

*Corresponding author's email: rodda.michele@gmail.com

(Manuscript received 15 April 2020; Accepted 11 June 2020; Online published 18 June 2020)

ABSTRACT: The new species, *Heterostemma carnosum* is described, illustrated and compared with the similar species *Heterostemma dalzellii*. The two species differ in peduncle, pedicel and corolla size as well as in leaf shape.

KEY WORDS: Ceropogonaceae, Crater Mountain, Papuasiasia.

INTRODUCTION

Heterostemma Wight is a genus of 30 to 40 terrestrial climbers found from Northern India to the Western Pacific Islands (Swarupanandan *et al.*, 1989; Forster, 1992). The genus has been revised in various regional accounts e.g. for Java (Backer and Bakhuizen van den Brink, 1965), India (Swarupanandan *et al.*, 1989; Jagtap and Singh, 1999), Australia and the Western Pacific Islands (Forster, 1992), China (Li *et al.*, 1995), Vietnam (Tran, 2017) and Thailand (Thaithong *et al.*, 2018). Four new species have been published in recent years (Agnihotri *et al.*, 2019; Kidyoo, 2019; Meve *et al.*, 2018; Tran *et al.*, 2020)

Heterostemma in New Guinea was not revised by Forster (1992) because the types of names published by Schlechter (1914) from Papua New Guinea were not located and considered lost in the fire of the Berlin herbarium in 1943 (Hiepko, 1978; Nicholas, 1992). Original material of *Heterostemma papuanum* Schltr. was later found at BO by Forster and Liddle (1994) and considered a synonym of the widespread *H. acuminatum* Decne (described from Java, Indonesia). Types for *H. collinum* Schltr. (iconotype) *H. kaniense* Schltr. (lectotype) and *H. montanum* Schltr. (lectotype) were designated by Rodda (2016). The only taxon from New Guinea whose type has not been traced is *H. membranifolium* (Lauterb. & K.Schum.) Schltr. All these species are likely to belong to the *Heterostemma acuminatum* complex *sensu* Forster (1992) which is very broadly circumscribed to include species with a rotate corolla, a star-shaped corona with spreading lobes with distinct upper and lower spurs, the upper one flanked by two smaller side spurs. There appears to be a large variation in the morphology of the corona in this complex and to establish whether different taxa are present, a study throughout the distribution area of the complex must be conducted. While examining materials of *Heterostemma* from New Guinea on loan from A to the SING herbarium (Herbarium acronyms according to Thiers, 2020) a very unusual new species was discovered. It does not have the typical star-shaped corona

with spreading lobes but instead a compressed-globose corona with broadly triangular lobes, more similar to Indian species than to Papuasian and Australasian species. The new species is therefore described and illustrated here.

TAXONOMIC TREATMENT

Heterostemma carnosum Rodda, *sp. nov.*

Fig. 1

Similar to *H. dalzellii* Hook., as both species have flowers with a rotate corolla, papillose inside, and a compressed-globose sessile corona. They are separated by the length of the peduncle (10–25 mm in *H. carnosum*, vs < 5 mm in *H. dalzellii*), pedicel (12–15 mm in *H. carnosum* vs < 7 mm in *H. dalzellii*) and flower (corolla 2.5–3 cm diameter in *H. carnosum* vs < 1.5 cm in *H. dalzellii*).

Type: Papua New Guinea, Chimbu Province, Crater Mountain Wildlife Management Area, E. of Haia Village, 6°43'S, 145°00'E, 777 m a.s.l. 15 Mar. 1997, *W. Takeuchi 11766* (holotype A, isotype LAE, n.v.).

Herbaceous climber with clear latex. Stem and branches terete 2–3.5 mm in diameter, dark green or purple, glabrous or sparsely pubescent; internodes (2.5–)5–15 cm long. Leaves: petiole 10–25 × 1–1.5 mm, glabrous or pubescent; lamina fleshy, elliptic/ovate-elliptic, 3–8 × 1.5–4 cm, very dark green and glabrous above, yellow green, glabrous or sparsely pubescent below, margins broadly recurved, apex acuminate/shortly cuspidate, base attenuate, venation pinnate with 1 basal secondary vein and 1–3 secondary veins departing from the main vein, on each side of the main vein; basal collectors 4–5 at base of lamina, ovoid, 0.3–0.5 mm long. Inflorescence sciadioidal cyme bearing flowers at different developmental stages from immature buds to open flowers, with 1(–4) flowers open at a time; peduncle 10–25 × 1–2 mm, purple green, pubescent turning glabrescent. Pedicel 12–15 × ca. 0.5 mm in diameter, pubescent. Flower 2.5–3 cm in diameter. Sepals lanceolate, 4.5–6 × 1–2 mm, dull purple, outside sparsely pubescent, inside glabrous; with collectors at sinus. Corolla fleshy, rotate, 2.5–3 cm in diameter, shiny purple red outside, dull red inside;

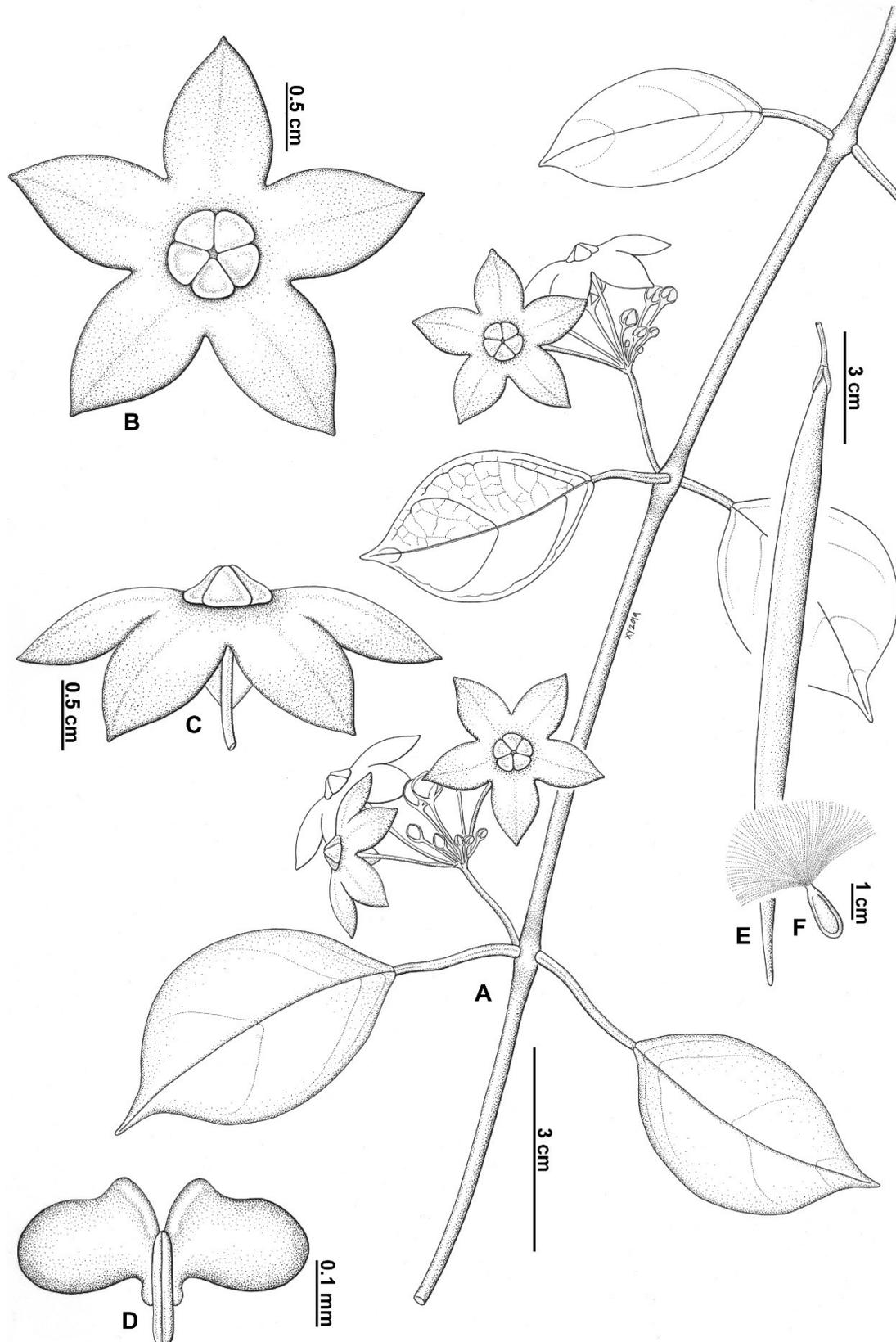


Fig. 1. *Heterostemma carnosum* Rodda. A. flowering branch; B. flower, view from above; C. flower, side view; D. pollinarium; E. follicle; F. seed. (Based on the holotype, drawing by Loh Xiang Yun).



tube 3–4 mm long, slightly reflexed at anthesis, outside glabrescent, inside thickly papillose; lobes valvate ovate, 9–12 × 6.5–8.5 mm, outside very sparsely pubescent, inside papillose, more densely towards the base, apex acuminate. Corona staminal, sessile, compressed-globose, 4–5 mm in diameter, ca. 2.5 mm high, dull red; lobes broadly triangular, ca. 2.5 × 2.5 mm, glabrous, inner apex raised, acute, outer apex rounded-truncate. Pollinarium: pollinia erect, obovate, yellow, ca. 150 × 220 µm, with sterile insertion crest on the inner side; corpusculum linear-ellipsoid, brown, ca. 175 × 30 µm; caudicles membranous, ca. 40 µm long. Ovary oblong, ca. 1.8 × 0.4 mm, glabrous. Fruit a single follicle, linear fusiform, ca. 16.5 × 0.7 cm, green, glabrous, seeds compressed, ovate, 16–17 × 7–8 mm, with a coma ca. 25 mm long.

Etymology. The specific epithet refers to the fleshy leaves and corolla (Latin *carnosus* = fleshy) that is an unusual feature in a genus that usually has species with thin leaves and corollas.

Distribution and ecology. *Heterostemma carnosum* is only known from one specimen collected East of Haia Village, within Crater Mountain Wildlife Management Area, Papua New Guinea. Based on the label information, *Heterostemma carnosum* was collected in hill forest with some anthropogenic disturbance at the margins of an old garden.

Proposed IUCN category. Since *Heterostemma carnosum* is known from a single collection, its conservation status is Data Deficient (DD; IUCN, 2012).

Notes. All species of *Heterostemma* known from New Guinea have a corolla < 1.5 cm in diameter and a star shaped corona with distinct spreading elongated lobes. *Heterostemma carnosum*, with a corolla 2.5–3 cm in diameter and a compressed-globose corona is therefore easily distinguished.

The only other *Heterostemma* species with a rotate corolla and a round corona is the Indian *Heterostemma dalzellii*. As mentioned in the diagnosis the two species can be separated on size of the peduncle, pedicel, and flower. Additionally, the lamina is elliptic/ovate-elliptic in *H. carnosum* and oblong-lanceolate in *H. dalzellii*.

Other species with a round corona are the Indian *H. beddomei* (Hook.f.) Swarupan. & Mangaly, *H. deccanense* (Talbot) Swarupan. & Mangaly, *H. disciflorum* (Hook.f.) Swarupan. & Mangaly, but all these species are easily distinguished from *H. carnosum* because they have urceolate or depressed globose corollas.

ACKNOWLEDGMENTS

I thank the directors and curators of the A, BM, K, LAE, P and SING herbaria for allowing access to and/or for providing high quality images of herbarium specimens. Loh Xiang Yun is thanked for preparing the illustration. Finally I would like to thank two anonymous reviewers for their valuable comments on the manuscript.

LITERATURE CITED

- Agnihotri, P., D. Husain, P. Katiyar, D. Sahoo, M. Rodda, and T. Husain.** 2019. *Heterostemma barikiana* (Apocynaceae, Asclepiadoideae), a new species from India, Myanmar and Thailand. *Phytotaxa* **419(2)**: 232–238.
- Backer, C.A. and R.C. Bakhuizen van den Brink.** 1965. Asclepiadaceae. In: Backer, C.A. & R.C. Bakhuizen van den Brink, (Eds.) *Flora of Java*. 2. N.V.P. Noordhoff, Groningen, pp. 244–274.
- Forster, P.I.** 1992. A taxonomic revision of *Heterostemma* Wight & Arn. (Asclepiadaceae: Stapeliaceae) in Australia and the western Pacific. *Aust. Syst. Bot.* **5(1)**: 71–80.
- Forster, P.I. and D.J. Liddle** 1994. Type Collections of Asclepiadaceae at Herbarium Bogoriense (BO). *Aust. Syst. Bot.* **7(5)**: 507–519.
- Hiepko, P.** 1978. Die erhaltenen Teile der Sammlungen des Botanischen Museums Berlin-Dahlem (B) aus der Zeit vor 1943. *Willdenowia* **8**: 389–400.
- IUCN.** 2012. IUCN Red List Categories and Criteria, version 3.1, 2nd edition. IUCN Species Survival Commission. Gland, Switzerland, and Cambridge: International Union for Conservation of Nature.
- Jagtap, A.P. and N.P. Singh** 1999. Asclepiadaceae. In: *Fascicles of Flora of India* 24. Botanical Survey of India, pp. 1–284.
- Kidyoo, A.** 2019. *Heterostemma ficoides* (Apocynaceae: Asclepiadoideae), a new species with fig-like flowers from Northern Thailand. *Kew Bull.* **74(2)**: 26.
- Li, P.T., M.G. Gilbert and W.D. Stevens** 1995. *Heterostemma*. In: Wu, Z.Y. & P.H. Raven (Eds.) *Flora of China* 16. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. pp. 263–265.
- Meve, U., G. Gâteblé and S. Liede-Schumann.** 2018. Two new species from the Ile des Pins (New Caledonia), and a not so new species from Grande Terre (New Caledonia). *Phytotaxa*: **349(3)**: 201–213.
- Nicholas, A.** 1992. The Asclepiadaceae works of Rudolf F. Schlechter (1872–1925). *Willdenowia* **22**: 215–264.
- Rodda, M.** 2016. Checklist and typification of *Heterostemma* (Apocynaceae, Asclepiadoideae, Ceropogoneae). *Phytotaxa* **263(1)**: 1–17.
- Schlechter, R.** 1914. Die Asclepiadaceen von Deutsch-Neu-Guinea. *Bot. Jahrb. Syst.* **50**: 81–164.
- Swarupanandan, K., N. Sasidharan and J.K. Mangaly** 1989. A reconsideration of the generic circumscription of *Heterostemma* Wight & Arn. (Asclepiadaceae) and a new species from India. *Bot. J. Linn. Soc.* **101(2)**: 249–259.
- Thaithong, O., A. Kidyoo and M. Kidyoo** 2018. *Handbook of Asclepiads of Thailand*. Amar Printing and Publishing Public Company Limited, Bangkok.
- Thiers, B.** 2020. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/science/ih/> (accessed 31 March 2020)
- Tran, T.B.** 2017. Asclepiadaceae. In: *Flora of Vietnam* **15**: 221–232, Publishing House for Science and Technology.
- Tran, T.B., L.N. Han, D.V. Hai, B.H. Quang, N.T.T. Huong, B.T. Ha, T.V. Hai and M. Rodda.** 2020. *Heterostemma cucphuongense* (Apocynaceae, Asclepiadoideae), a new species from Vietnam. *Phytokeys* **148**: 119–124.