



This work is licensed under a Creative Commons Attribution License (CC BY 4.0).

## Research article

# ***Hoya* of Sumatra, an updated checklist, three new species, and a new subspecies**

Sri RAHAYU<sup>1</sup> & Michele RODDA<sup>2,\*</sup>

<sup>1</sup>Bogor Botanic Gardens, Indonesian Institute of Sciences, Bogor, Indonesia.

<sup>2</sup>Herbarium, Singapore Botanic Gardens, National Parks Board, 1 Cluny Road, 259569, Singapore.

\*Corresponding author: [rodma.michele@gmail.com](mailto:rodma.michele@gmail.com)

<sup>1</sup>Email: [sriahayukrb@yahoo.com](mailto:sriahayukrb@yahoo.com)

**Abstract.** The list of the species of *Hoya* R.Br. occurring on the Indonesian island of Sumatra is updated and the type citation is clarified. Sixteen taxa are added to the latest checklist. *Hoya danumensis* subsp. *amarisii* S.Rahayu & Rodda subsp. nov., *H. rigidifolia* S.Rahayu & Rodda sp. nov., *H. solokensis* S.Rahayu & Rodda sp. nov., and *H. sumatrana* S.Rahayu & Rodda sp. nov. are newly described. *Hoya parviflora* Wight, *H. parvifolia* Schltr., and *H. purpureofusca* Hook. are lectotypified.

**Keywords.** Apocynaceae, Asclepiadaceae, Asclepiadoideae, Indonesia, Marsdenieae.

Rahayu S. & Rodda M. 2019. *Hoya* of Sumatra, an updated checklist, three new species, and a new subspecies. *European Journal of Taxonomy* 508: 1–23. <https://doi.org/10.5852/ejt.2019.508>

## Introduction

Indonesia has been predicted to have the most diverse array of species of *Hoya* R.Br (Brown 1810; Kleijn & van Donkelaar 2001). However, a full inventory of *Hoya* occurring in Indonesia is yet to be completed. Indonesia is an extremely large and diverse country and our plan is to complete an inventory and revision of the Indonesian *Hoya* working on seven separate geographical areas: Sumatra, Java, Kalimantan, Lesser Sunda Islands, Sulawesi, Maluku, and Indonesian New Guinea.

Recent papers on Indonesian *Hoya* were published by Kleijn & van Donkelaar (2001), who revised the genus in central Sulawesi, where 13 species occur; by Rahayu & Wanntorp (2012), who published a checklist and a key to the *Hoya* of Sumatra that included 27 species; and lastly by Lamb & Rodda (2016), who published a checklist of the Bornean species including 72 species, 34 of which occurring in Kalimantan. The most recently published *Hoya* from Sumatra is *H. fauziana* subsp. *angulata* Rodda *et al.* (2018).

The present paper aims at updating the checklist and clarifying the type citation of all the taxa of *Hoya* from Sumatra. Three species and one new subspecies are newly published: *H. danumensis* subsp. *amarisii* S.Rahayu & Rodda subsp. nov., *H. rigidifolia* S.Rahayu & Rodda sp. nov. (based on material identified by Rahayu & Wanntorp (2012) as *H. oblanceolata* Hook.f.), *H. solokensis* S.Rahayu & Rodda sp. nov., and *H. sumatrana* S.Rahayu & Rodda sp. nov.

## Material and methods

The present paper is based on the examination of specimens at B, BO, BM, K, and SING, as well as JSTOR Global Plants (<https://plants.jstor.org/>, accessed on 24 Jul. 2018) and on field-collected plants cultivated at the Bogor Botanic Gardens. All names have been verified on International Plant Names Index (<http://www.ipni.org/>, accessed on 24 Jul. 2018) and TROPICOS (<http://www.tropicos.org/>, accessed on 24 Jul. 2018). All protologues and type citations have been verified on Biodiversity Heritage Library (<https://www.biodiversitylibrary.org/>, accessed on 24 Jul. 2018), JSTOR (<https://www.jstor.org/>, accessed on 24 Jul. 2018) or at the Singapore Botanic Gardens library. Heterotypic synonyms are indicated only when based on types from Sumatra. All acronyms for repositories follow Thiers (2019).

## Results

### *Checklist of the genus Hoya of Sumatra*

Class Magnoliopsida Brongn.  
Subclass Asteridae Takht.  
Order Gentianales Juss. ex Bercht. & J.Presl  
Family Apocynaceae Juss.  
Genus *Hoya* R.Br.

*Hoya andalensis* Kloppenb.

*Fraterna* 18 (1): 1 (Anonymous 2005).

#### Type material

##### Holotype

INDONESIA • Sumatra, Padang, Air Sirah; in a young secondary forest; cultivated in USA, California, Fresno, vouchered on 19 Aug. 2004; UC n.v.

*Hoya beccarii* Rodda & Simonsson

*Webbia* 68: 13 (Rodda & Simonsson Juhonewe 2013).

#### Type material

##### Holotype

MALAYSIA • Sarawak, Matang; Jul. 1866; O. Beccari 6536a leg.; FI.

##### Isotype

MALAYSIA • Same data as for the holotype; FI.

*Hoya brooksii* Ridl.

*Bulletin of Miscellaneous Information* 1925: 85 (Ridley 1925).

#### Type material

##### Lectotype (designated by Turner *et al.* 2018)

INDONESIA • Sumatra, Lubuk Tandai; Jun. 1922; C.J. Brooks 7615 leg.; K000613013.

***Hoya campanulata* Blume**

*Bijdragen tot de flora van Nederlandsch Indië*: 1064 (Blume 1826). — *Cystidanthus campanulatus* (Blume) Hasskarl, *Adnotationes de Plantis quibusdam Javanicis nonnullisque japonicis, haud rite cognitis, e Catalogo Horti Bogoriensis excerptae. Accedunt nunnulae Novae Species*: 125 (Hasskarl 1843). — *Physostelma campanulatum* (Blume) Decne., *Asclepiadeae*: 633 (Decaisne 1844).

**Type material**

**Lectotype** (designated by Rodda *et al.* 2016)

INDONESIA • Java, “ex horto, mento septembre, Tjungkankan, Burangarang”; L0004389.

***Hoya caudata* Hook.f.**

*The Flora of British India* 4: 60 (Hooker 1883).

**Type material**

**Lectotype** (designated by Rintz (1978), first step, and then by Rodda (2017), second step)

MALAYSIA • Malacca, A.C. Maingay 1956 leg.; Kew distribution no. 1128; K000895134.

**Isolectotypes**

MALAYSIA • Same data as for the lectotype; K000895133, L0004315.

***Hoya coriacea* Blume**

*Bijdragen tot de flora van Nederlandsch Indië*: 1063 (Blume 1826).

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • “In fruticetis ad pedem montis Salak” [Java, Salak]; L (sheet no. 898.168–117).

**Possible isolectotype**

INDONESIA • Same data as for the lectotype; P00639838.

***Hoya coronaria* Blume**

*Bijdragen tot de flora van Nederlandsch Indië*: 1063 (Blume 1826). — *Eriostemma coronaria* (Blume) Kloppenb. & Gilding, *Fraterna* 14 (2): 1 (Anonymous 2001).

**Type material**

**Lectotype** (designated by Kleijn & van Donkelaar 2001: 469)

INDONESIA • Java; *sine coll.* “124/6” leg.; L (sheet no. 898.168–121).

**Isolectotype**

INDONESIA • Same data as for the lectotype; L (sheet no. 898.168–128).

*Hoya danumensis* subsp. *amarii* S.Rahayu & Rodda subsp. nov.

[urn:lsid:ipni.org:names:77194999-1](http://urn:lsid:ipni.org:names:77194999-1)

Figs 1A–B, 2A–B

### Etymology

The new species is named after Amar Husein Sitompul, who collected the type specimen.

### Type material

#### Holotype

INDONESIA • Sumatra, North Sumatra, Padang Sidempuan; ca 900 m a.s.l.; 16 Sep. 2014; Amar Husein Sitompul s.n. leg.; BO.

### Description

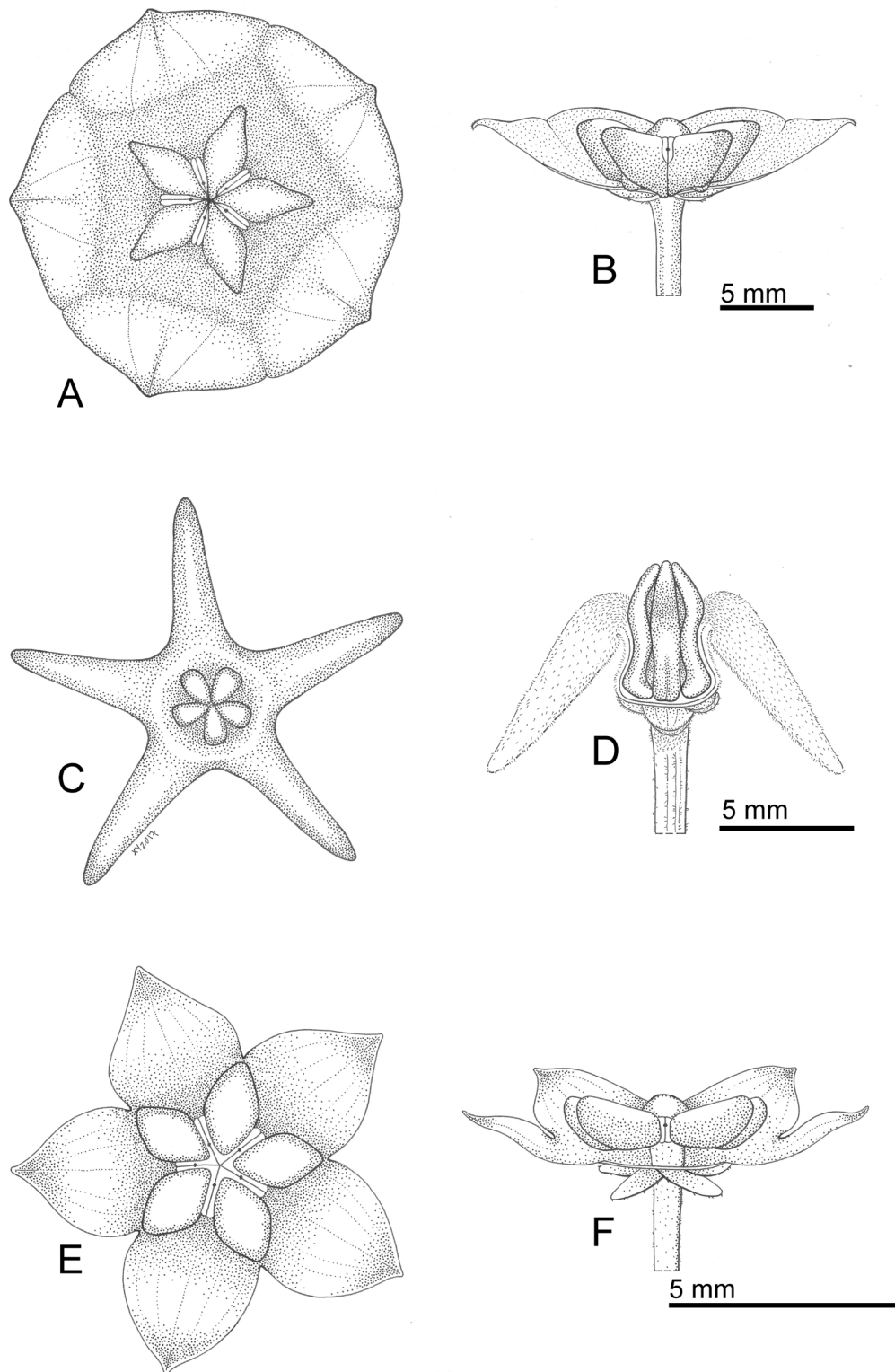
Epiphytic shrub, with white latex in all vegetative parts. Roots only basal, no adventitious roots observed. Stems erect or spreading, 4–6 mm in diameter, bright green, sparsely pubescent when young; older stems grey, glabrous; internodes 2–4(6) cm. Leaf blades 5–12 × 2.5–5 cm, thin, not succulent, chartaceous when dry, broadly lanceolate to oblong, base rounded, apex acuminate or caudate, mid green on adaxial surface, pale green on abaxial surface, glabrous (sparsely pubescent when young), venation pinnate, midrib slightly depressed on adaxial surface, convex on abaxial surface, secondary veins 3–7 pairs, basal colleters absent; petioles 5–10 × 2–3 mm, terete, channelled above, twisted, mid green, sparsely pubescent when young, otherwise glabrous. Inflorescences sciadioidal, convex, of 5–15 flowers, with peduncles extra-axillary, positively geotropic, unbranched, one at each node, producing flowers subsequently a few times, terete, 10–15 × 1.5–2.5 mm, green, sparsely pubescent when very young. Flowers with terete pedicels 2.5–3 cm × 0.06–0.08 mm, pale green, glabrous. Calyx lobes triangular, apex round, 1.5–2 × 0.5–0.6 mm, sparsely pubescent outside or glabrous, inside glabrous, ciliate; basal colleters 0.15–0.25 × 0.15–0.2 mm, one at each calyx sinus, ovoid. Buds globose, 5-ridged, dark brown or deep purple when young, turning green. Corolla shallowly campanulate, 20–23 mm in diameter; tube 9–11 mm long, creamy white, glabrous outside, pilose inside, basally densely pubescent; lobes 2–3 × 11–12 mm, very broadly triangular, valvate in bud, creamy white, glabrous outside, very sparsely pubescent inside, tip glabrous. Corona staminal 4–5 mm high, 10–12 mm in diameter, stiff and waxy-looking, white; lobes 4.5–5 × 2.3–2.5 mm, spreading, ovate, attached at the back of the anthers, inner process apiculate, not touching in the middle, outer process acute with a rounded tip, lobes with revolute margin underneath. Anthers ca 0.7 × 0.5 mm, ovate, with apical round membranaceous appendage covering the style-head apex. Pollinia 550–650 × 220–270 μm, oblong, with a round base and an obliquely truncated apex; pellucid margin present all along the outer edge; caudicles ca 280 × 180 μm, broadly triangular, almost transparent; corpusculum 300–350 × 100–120 μm, oblong; style-head 5-angled in cross section, with five spreading lobes alternating with the stamens, style-head depressed with a central raised conical apex ca 0.5 × 0.5 mm broad at the base, apex rounded; ovary 1.4–1.6 mm high, 0.3–0.4 mm in diameter, narrowly conical, apex acute. Fruit and seed not observed.

### Distribution and habitat

*Hoya danumensis* subsp. *amarii* subsp. nov. is only known from the type locality in northern Sumatra, Indonesia, ca 900 m a.s.l.

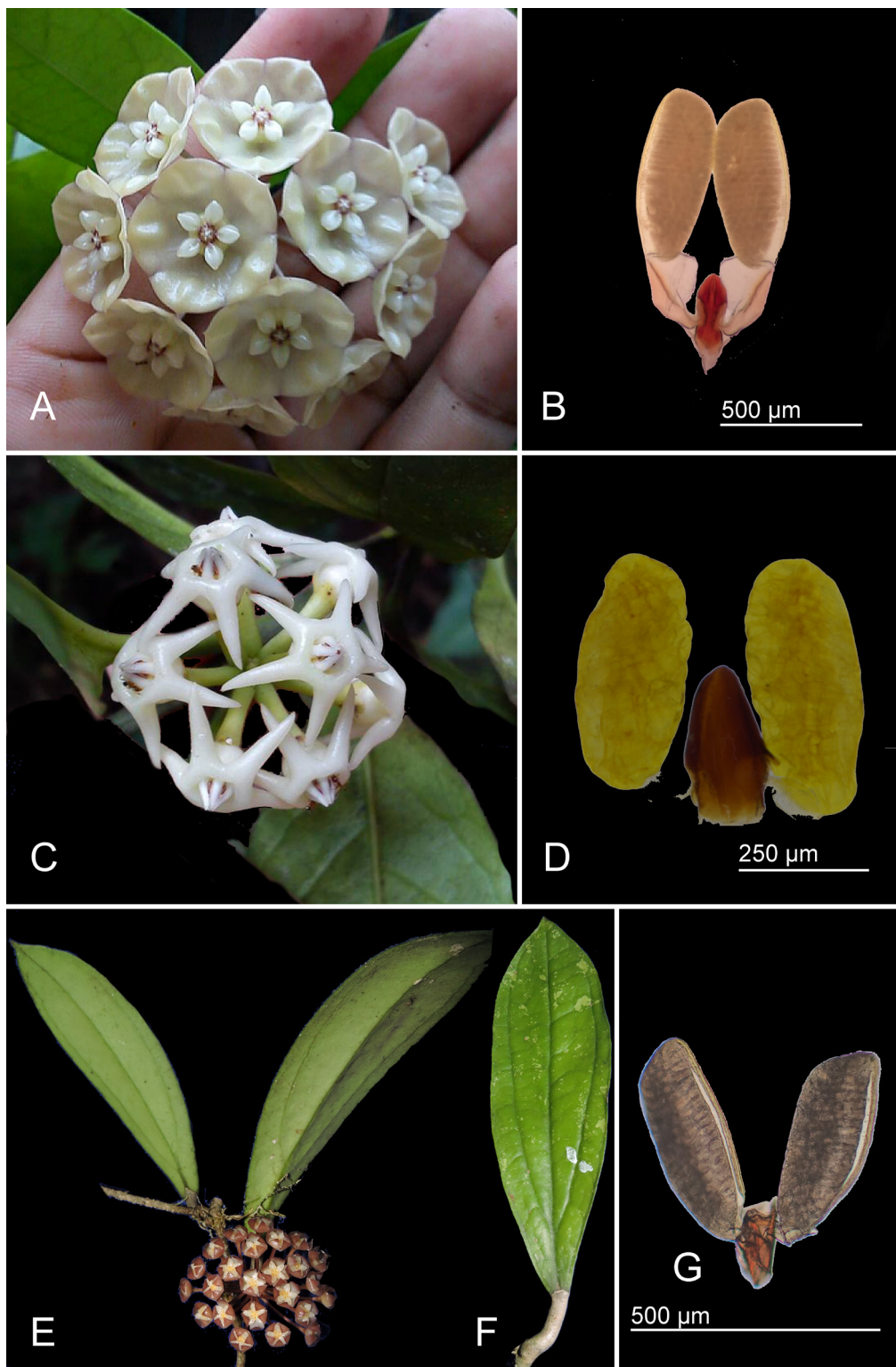
### Conservation status

Known only from a single collection and lacking information on the distribution area, the population size and the possible threats to the habitat, *H. danumensis* subsp. *amarii* is considered as Data Deficient (DD) (IUCN 2012).



**Fig. 1.** Flowers. **A, C, E.** Top view of the flower. **B, D, F.** Side view of the flower, with part of corolla removed. **A–B.** *H. danumensis* subsp. *amarii* S.Rahayu & Rodda subsp. nov. (Amar Husein Sitompul s.n. leg., BO). **C–D.** *H. solokensis* S.Rahayu & Rodda sp. nov. (Fadly s.n. leg., BO). **E–F.** *H. rigidifolia* S.Rahayu & Rodda sp. nov. (S. Rahayu 865 leg., BO). Drawing: X. Y. Loh.





**Fig. 2.** Inflorescence, pollinarium, and leaf. **A, C, E.** Inflorescences. **B, D, G.** Pollinaria. **F.** Leaf. **A–B.** *H. danumensis* subsp. *amarii* S.Rahayu & Rodda subsp. nov. (Amar Husein Sitompul s.n. leg., BO). **C–D.** *H. solokensis* S.Rahayu & Rodda sp. nov. (Fadly s.n. leg., BO). **E–G.** *H. rigidifolia* S.Rahayu & Rodda sp. nov. (S. Rahayu 865 leg., BO). Photos: Amar Husein Sitompul (A), Fadly (C), S. Rahayu (E–F), and M. Rodda (B, D, G).

**Notes**

*Hoya danumensis* subsp. *amarii* subsp. nov. can be separated from *H. danumensis* Rodda & Nyhuus (2009) subsp. *danumensis* because of the shape and size of the corolla that is shallowly campanulate, 20–23 mm in diameter and deeply campanulate, vs 25–35 mm in the latter; in the shape and size of the corona lobes that are ovate-oblong and  $5.5\text{--}6 \times 2.4\text{--}2.6$  mm in *H. danumensis* subsp. *danumensis* vs ovate and  $4.5\text{--}5 \times 2.3\text{--}2.5$  mm in the new subspecies.

***Hoya deykeae* T.Green**

*Fraterna* 13 (1): 15 (Green 2000) [published as “*H. deykei*”].

**Type material**

**Holotype**

INDONESIA • Sumatra; R. van Donkelaar & D. Jannink 03–90 IPPS 4094 leg.; cultivated in USA, Hawaii, Oahu, Ka‘a‘awa, vouchered as ‘T. Green 9903’; BISH1014777.

***Hoya diversifolia* Blume**

*Bijdragen tot de flora van Nederlandsch Indië*: 1064 (Blume 1826).

**Type material**

**Lectotype** (designated by Rodda 2017)

Rumphius (1747: tab. 175 fig. 2).

**Epitype** (designated by Rodda 2017)

INDONESIA • “*Hoya heterophylla*”; L (sheet no. 989168–147).

***Hoya elliptica* Hook.f.**

*The Flora of British India* 4: 58 (Hooker 1883).

**Type material**

**Lectotype** (designated by Rodda 2017)

MALAYSIA • Malacca; 1 Apr. 1868; A.C. Maingay 3286 leg.; Kew distribution no. 1137; K000895126.

**Isolectotype**

MALAYSIA • Same data as for the lectotype; K000895127.

***Hoya fauziana* subsp. *angulata* Rodda, A.L.Lamb, Gokusing & S.Rahayu**

*Blumea* 63: 144 (Rodda *et al.* 2018).

**Type material**

**Holotype**

MALAYSIA • Sabah, Tawau, Kalabakan area; 16 May 2017; L. Gokusing LG56/2017 leg.; mixed hill Dipterocarp forest; SAN.

***Hoya finlaysonii* Wight**

*Contributions to the Botany of India*: 38 (Wight 1834).

**Type material**

**Lectotype** (designated by Rodda 2017)

MALAYSIA • Penang?; ex herb. Finlayson, Wallich Asclepiad no. 42 (B = Wallich Catalogue 8166B); K000895121.

**Isolectotypes**

MALAYSIA • Same data as for the lectotype; K001129114, E00179577.

*Hoya forbesii* King & Gamble

*Journal of the Asiatic Society of Bengal* 74 (2): 574 (King & Gamble 1908).

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • Sumatra, Kaba Volcano; 1881; H.O. Forbes 2896a leg.; K000894730.

*Hoya glabra* Schltr.

*Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 40 (92): 14 (Schlechter 1908).

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • Borneo, Long Wahau; 2 Aug. 1901; R. Schlechter 13458 leg.; B100277199.

**Other material examined**

INDONESIA • Sumatra, Monkey reserve; 2°41.589' N, 98°55.656' E; 1215 m a.s.l.; I.M. Liddle 1552 leg.; top of ridge; Singapore Botanic Gardens living collections no. 20123057, vouchered on 11 Feb. 2013 as 'M. Rodda MR286'; SING.

*Hoya imperialis* Lindl.

*Edwards's Botanical Register* 32: tab. 68 (Lindley 1846).

**Type material**

**Lectotype** (designated by Rodda 2017)

MALAYSIA? • Ex herb. J. Lindley [cultivated, from Sarawak via Lowe's Nursery]; CGE06041.

*Hoya kastbergii* Kloppenb.

*Fraterna* 16 (4): 1 (Anonymous 2003).

**Type material**

**Holotype**

MALAYSIA • Sarawak, Bau; I.S.A. Kastberg s.n. leg.; UC, missing.

**Neotype** (designated by Rodda 2017)

MALAYSIA • Sarawak, Bau, near Mulu National Park H.Q.; 23 Mar. 1981; I.S. Collenette 2357 leg.; L2726571.



**Isonotype**

MALAYSIA • Same data as for the neotype; K.

***Hoya lacunosa*** Blume

*Bijdragen tot de flora van Nederlandsch Indië*: 1063 (Blume 1826). — *Otostemma lacunosum* (Blume) Blume, *Rumphia* 4: 30 (Blume 1849b).

**Original citation**

“Circa Buitenzorg at arbores”.

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • “*Hoya lacunosa*”; L [sheet no. 898168–188].

***Hoya lasiantha*** (Korth. ex Blume) Miq.

*Flora van Nederlandsch Indie* 2: 526 (Miquel 1857). — *Plocostemma lasianthum* Korth ex Blume, *Museum Botanicum Lugduno-Batavum* 1: 60 (Blume 1849a).

**Original citation**

“Ad montem Pamotton insulae Borneo”.

**Type material**

**Lectotype** (designated by Rodda 2017)

MALAYSIA/INDONESIA? • Borneo; P. Korthals s.n. leg.; U1102625.

**Epitype** (designated by Rodda 2017)

Blume (1849a: fig. 14).

***Hoya latifolia*** G. Don

*A General History of the Dichlamydeous Plants* 4: 127 (Don 1837). — *H. macrophylla* Wight, *Contributions to the Botany of India*: 38 (Wight 1834), non Blume, *Bijdragen tot de flora van Nederlandsch Indië*: 1063 (Blume 1826).

**Type material**

**Lectotype** (designated by Rodda 2017)

MALAYSIA • Penang; Wallich Asclepiad no. 138 (A = Wallich Catalogue 8161A); K000895124.

**Isolectotype**

MALAYSIA • Same data as for the lectotype; CGE (two sheets, one of which also containing leaves of *H. mitrata*), E00179576, K000895125.

***Hoya mitrata*** Kerr nom. cons.

*Hooker's Icones Plantarum* 35: tab. 3406 (Kerr 1940).

**Type material**

**Lectotype** (designated by Rintz 1978)

THAILAND • Surat, Ban Tong Tao; A.F.G. Kerr 13152 leg.; K.

*Hoya multiflora* Blume

*Catalogus van eenige der merkwaardigste zoo in-als uit-heemsche gewassen, te vinden in 's lands plantentuin te Buitenzorg*: 49 (Blume 1823). — *Centrostemma multiflorum* (Blume) Decne., *Annales des Sciences naturelles, Botanique, sér. 2*, 9: 272 (Decaisne 1838). — *Cyrtoceras multiflorum* (Blume) Heynh., *Nomenclator Botanicus Hortensis*: 183 (Heynhold 1840).

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • Java, “prope flumine Tjapaes[?] Kietpil[?], Salleh”; 16 Sep. 1820; L2727033.

*Hoya obtusifolia* Wight

*Contributions to the Botany of India*: 38 (Wight 1834).

**Type material**

**Holotype**

MALAYSIA • Penang?; Wallich Asclepiad no. 38 (Wallich Catalogue 8167); K000895115.

**Isotypes**

MALAYSIA • Same data as for the holotype; E00179578, K001129115.

*Hoya omlorii* (Livsh. & Meve) L. Wanntorp & Meve

*Willdenowia* 41: 99 (Wanntorp & Meve 2011). — *Clemensiella omlorii* Livsh. & Meve, *Edinburgh Journal of Botany* 66 (3): 454 (Meve *et al.* 2009) [published as “*Clemensiella omlori*”].

**Type material**

**Holotype**

INDONESIA • Sumatra, Aceh, Gunung Leuser Reserve, Camp Simpang and vicinity; 19 Aug. 1972; W.J.J.O. de Wilde & B.E.E. de Wilde-Duyfjes 14377 leg.; L.

**Isotype**

INDONESIA • Same data as for the holotype; K.

*Hoya parviflora* Wight

*Contributions to the Botany of India*: 37 (Wight 1834).

**Synonym**

*H. variifolia* Ridl., *Bulletin of miscellaneous information, Royal Gardens, Kew* 1926: 74 (Ridley 1926) syn. nov. Type: INDONESIA • Sumatra, Sipora; 27 Oct. 1924; C.B. Kloss 14793 leg.; K000894735 (holotype), SING005940 (isotype).

**Type material**

**Lectotype** (designated here)

MYANMAR • “Maulmyne”; HRWP, Wallich Wall. Asclep. 33; K000895132.

*Hoya parvifolia* Schltr.

*Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 40 (92): 15 (Schlechter 1908).

**Type material**

**Lectotype** (designated here)

INDONESIA • Sumatra, Indragiri, auf Bäumen am Danau Kotta; 9 May 1901; R. Schlechter 13307 leg.; B100277226.

*Hoya purpurascens* Teijsm. & Binn.

*Natuurkundig Tijdschrift voor Nederlandsch Indië* 25: 407 (Teijsmann & Binnendijk 1863).

**Original citation**

“Sumatrae prov Lampong, Teijsmann” (type material not traced).

**Remarks**

This name is not recorded in Tropicos (<http://www.tropicos.org>, accessed on 24 Jul. 2018) and IPNI (<http://www.ipni.org>, accessed on 24 Jul. 2018) only records it as a *nomen nudum* (Teijsmann & Binnendijk 1866). The species was validly published by Teijsmann & Binnendijk (1863). Original material has been searched at BO, KRB, L, and U, but none has been found and it is possible that the species was described based on a live plant only.

*Hoya purpureofusca* Hook.

*Botanical Magazine* 76: tab. 4520 (Hooker 1850). — *H. cinnamomifolia* var. *purpureofusca* (Hook.) Kloppenb., *Fraterna* 14 (1): 12 (Kloppenburger 2001).

**Type material**

**Lectotype** (designated here)

INDONESIA • Java; T. Lobb s.n. leg.; cultivated [Veitch Nursery?]; K000894742.

*Hoya revoluta* Wight ex Hook.f.

*The Flora of British India* 4: 55 (Hooker 1883).

**Type material**

**Lectotype** (designated by Forster & Liddle 1992b)

MALAYSIA • A.C. Maingay 1127 leg.; K000279860.

**Epitype** (designated by Rodda & Simonsson Juhonewe 2013)

MALAYSIA • Pahang, Tasek Bera, low altitude; 14 Oct. 1930; M.R. Henderson 24439 leg.; SING.

*Hoya rhodostele* Ridl.

*Journal of the Malayan Branch of the Royal Asiatic Society* 1: 77 (Ridley 1923).

**Type material**

**Lectotype** (designated by Turner *et al.* 2018)  
INDONESIA • Sumatra, Berastagi; 8 Feb. 1921; H.N. Ridley s.n. leg.; K000894741.

**Additional type material**

INDONESIA • Sumatra, Berastagi; 13 Feb. 1921; H.N. Ridley s.n. leg.; K000894740.

*Hoya rigidifolia* S.Rahayu & Rodda sp. nov.

[urn:lsid:ipni.org:names:77195000-1](http://urn:lsid:ipni.org:names:77195000-1)

Figs 1E–F, 2E–G

**Etymology**

The new species is named for its rigid and stiff leaves.

**Type material**

**Holotype**

INDONESIA • Sumatra, western Sumatra, Mentawai Islands, Pulau Siberut; 100 m a.s.l.; Aug. 2014; S. Rahayu 865 leg.; vouchered from live collection at Bogor Botanic Garden on 26 Sep. 2016 as ‘S. Hidayat B9710110’; BO.

**Description**

Epiphytic climber, with white latex in all vegetative parts. Roots adventitious below the nodes and along the internodes. Stems climbing, 3–4 mm in diameter, dull brown, sparsely pubescent; older stems grey, glabrous; internodes 4–10 cm. Leaf blades 4–12(15) × 2.5–5 cm, stiff and succulent, lanceolate to oblong, base acute, apex apiculate, mid to pale green on adaxial surface with sparse grey spots, pale green on abaxial surface with darker lines corresponding with the main vein and two prominent secondary veins, glabrous or sparsely pubescent when young, venation pinnate but with two prominent secondary veins running along the entire length of the lamina, and with a further 3–10 small secondary veins each side, primary and secondary veins depressed on adaxial surface, flat on abaxial surface; basal colletar ca 1 × 1.5 mm, one at each lamina base, broadly triangular, pale brown/cream; petioles 7–25 × 4–6 mm, terete, thicker than stems, pale brown, sparsely pubescent when young. Inflorescences 3.5–4 cm in diameter, of 20–25 flowers, sciadioidal, convex; peduncles 15–30 × ca 3 mm, terete, extra-axillary, laterally held, one at each node, producing flowers over an extended period of time, brownish, sparsely pubescent. Flowers with terete pedicels 13–17 × 0.7–1 mm, pale brownish yellow, minutely papillose. Calyx lobes ovate or round, apex rounded, 1–1.5 × 0.8–1 mm, minutely papillose outside, glabrous inside, ciliate; basal colleters 250–300 × 120–150 µm, ovoid, one at each calyx sinus. Corolla rotate, 10–12 mm in diameter when flattened; tube ca 1.5 mm long, cream inside, pale brown outside, glabrous; lobes 3.3–3.7 × 2.4–2.8 mm, ovate, valvate in bud, with incurved acute tip, cream fading to pale brown at the tip inside, brown outside, glabrous. Corona staminal, 1.2–1.4 mm high, 3.7–4.2 mm in diameter, white; lobes 2–2.3 × 1.1–1.2 mm, attached at the back of the anthers, held at a ca 80° angle, ovoid, slightly carinate above, inner process acute, erect, outer process rounded, spreading, with a basal revolute margin. Anthers ca 0.7 × 0.6 mm, ovate, including a thin apical round membranaceous appendage. Pollinia 350–400 × 130–150 µm, oblong, with a round base and an obliquely truncate apex; with a pellucid margin along the outer edge; caudicles ca 40 × 20 µm, much reduced; corpusculum 120–140 × ca 50 µm, oblong; style-head 5-angled in cross section, with five spreading lobes alternating

with the stamens, style-head apex depressed with a central conical acute tip ca 200 µm high; ovary 0.8–0.9 mm high, ca 0.35 mm in diameter at the base, conical, lightly curved, apex acute. Fruit and seed not observed.

**Distribution and habitat**

*Hoya rigidifolia* sp. nov. is only known from the type locality in the lowland forest of Pulau Siberut, southern Sumatra, Indonesia.

**Conservation status**

Known only from a single collection and lacking information on the distribution area, the population size and the possible threats to the habitat, *H. rigidifolia* sp. nov. is considered as Data Deficient (DD) (IUCN 2012).

**Notes**

*Hoya rigidifolia* sp. nov. flowers only open for a single day. The flowers of *H. finlaysonii* are also open for a single day and have a similar flower morphology (rotate corolla, ovoid corona lobes of similar size). Both species are, however, easily separated based on leaf characters. *Hoya finlaysonii* has lanceolate to oblong leaves with pinnate venation, usually darker than the rest of the lamina; *H. rigidifolia* sp. nov. also has pinnate venation, but additionally it has two basal secondary veins running along the entire length of the lamina. The leaf venation of *H. erythrina* Rintz (1978) is similar to that of *H. rigidifolia* sp. nov.; however, both species can be separated based on flower characters: *H. erythrina* has flowers with corolla > 15 mm in diameter when flattened, long-pubescent inside, and lasting > 2 days, while *H. rigidifolia* sp. nov. has flowers with corolla < 12 mm in diameter when flattened, glabrous inside, and lasting one day.

***Hoya rintzii*** Rodda, Simonsson & S.Rahayu

*Webbia* 69: 44 (Rodda *et al.* 2014).

**Type material**

**Holotype**

MALAYSIA • Selangor, Sungai Langat; 3 Jun. 1976; R.E. Rintz RER61 leg.; KEP.

**Isotype**

MALAYSIA • Same data as for the holotype; K.

***Hoya rundumensis*** (T.Green) Rodda & Simonsson

*Webbia* 68: 13 (Rodda & Simonsson Juhonewe 2013). — *H. plicata* subsp. *rundumensis* T.Green (Green 2010: 19).

**Type material**

**Holotype**

MALAYSIA • Sabah, Rundum; 3000 ft; cultivated in USA, Oahu, Ka‘a‘awa, Hawaii, garden of Ted Green, vouchered on 12 Aug. 2009 as ‘T. Green 2010.001’; BISH1016412.

***Hoya sarcophylla*** Ridl.

*Journal of the Federated Malay States Museums* 8 (4): 62 (Ridley 1917).



### Type material

**Lectotype** (designated by Turner *et al.* 2018)

INDONESIA • Sumatra, Korinchi, Siolak Daras; 3000 ft; 17 Mar. 1914; H.C. Robinson & C.B. Kloss s.n. leg.; BM001190937.

*Hoya scortechinii* King & Gamble

*Journal of the Asiatic Society of Bengal* 74 (2): 567 (King & Gamble 1908).

### Type material

**Lectotype** (designated by Rodda 2017)

MALAYSIA • Perak; B. Scortechini 464b leg.; K000895122.

*Hoya sigillatis* T.Green subsp. *sigillatis*

*Fraterna* 17 (3): 2 (Green 2004).

### Type material

**Holotype**

MALAYSIA • Sabah, Tenom Agricultural Park; cultivated in USA, Hawaii, Oahu, Ka‘a‘awa, vouchered on unknown date as ‘T. Green 91024’; BISH1014783.

*Hoya solokensis* S.Rahayu & Rodda sp. nov.

[urn:lsid:ipni.org:names:77195001-1](https://nomenclature.ipni.org/names/77195001-1)

Figs 1C–D, 2C–D

### Etymology

The new species is named after the collection locality in Solok, Sumatra.

### Holotype

INDONESIA • Sumatra, Solok; ca 1000 m a.s.l.; 10 Oct. 2016; Fadly s.n. leg.; BO.

### Description

Epiphytic shrub, with white latex in all vegetative parts. Roots only basal, no adventitious roots observed. Stems erect or spreading, 2.5–5 mm in diameter, dull green, sparsely pubescent when young; older stems grey-brown, glabrous; internodes 1–2(5) cm. Leaf blades 5–10(12) × 2.5–4 cm, thin, not succulent, chartaceous when dry, elliptic, base and apex acute or acuminate, mid green on adaxial surface, pale green on abaxial surface, glabrous, venation pinnate, midrib slightly depressed on adaxial surface, convex on abaxial surface, with 4–7 pairs of secondary veins, basal colletes absent; petioles 5–10 × 1.7–2 mm, terete channeled above, mid green, sparsely pubescent. Inflorescences sciadioidal, convex, of 3–10 flowers; peduncles 8–12 × 1.2–1.4 mm, extra-axillary, positively geotropic or horizontal, unbranched, one at each node, producing flowers only once, terete, green, sparsely pubescent just below the rachis, otherwise glabrous. Flowers with terete pedicels 5–8 × 1–1.5 mm, pale green, sparsely pubescent. Calyx lobes ovate-round, apex round, 1.4–2.2 × 1.2–1.6 mm, light green, pubescent outside, glabrous inside, ciliate; basal colletes 1.5–2.3 × 1.3–1.5 mm, 1–3 at each calyx sinus, ovoid. Corolla tube basally bulbous, tightly enveloping the lower half of the corona, with a contracted throat, a short funnel-shaped tube and free, lanceolate, spreading lobes, white; basal bulbous part 2.5–3 mm high, 3–3.5 mm in diameter; free lobes 5–6 × 2.5–3 mm, narrowly triangular, valvate in bud, with recurved edges and tip, tube pubescent inside with retrorse hairs, sparsely pubescent outside with spreading hairs,

lobes sparsely pubescent inside and outside with spreading hairs. Corona staminal 4.5–5 mm high, 2.5–3 mm in diameter, stiff and waxy-looking, white; lobes 4.5–5 × 1–1.2 mm, erect, oblong and sinuose, attached at the back of the anthers, upper apicis rounded, touching in the middle, outer tips obtuse, with a narrow revolute margin. Anthers ca 0.5 × 0.3 mm, ovate, with apical round membranaceous appendage just covering the style-head apex. Pollinia 470–520 × 200–240 µm, oblong, with a round base and apex; pellucid margin missing; caudicles ca 130 × 70 µm, ovoid, almost transparent; corpusculum 300–320 × 160–180 µm, ovoid; style-head 5-angled in cross section, with five spreading lobes alternating with the stamens, style-head apex conical, 1–1.2 mm high, 0.9–1.1 mm in diameter at the base, apex acute; ovary 1.5–1.7 mm high, conical, with apex acute. Fruit and seed not observed.

### Distribution and habitat

*Hoya solokensis* sp. nov. is only known from the type locality in Solok, Sumatra, Indonesia, at ca 1000 m a.s.l. It was collected in an evergreen forest, where it was growing epiphytically.

### Conservation status

Known only from a single collection and lacking information on the distribution area, the population size and the possible threats to the habitat, *H. solokensis* sp. nov. is considered as Data Deficient (DD) (IUCN 2012).

### Notes

*Hoya solokensis* sp. nov. is one of the few species of *Hoya* that exhibits a non-climbing habit but is instead an epiphytic shrub. It is morphologically similar to *H. papaschonii* Rodda (Rodda & Ercole 2014), a species only found in southern Thailand. Both species share a shrubby habit, short-lived peduncles, and flowers with a tubular corolla. However, *H. papaschonii* has the free part of the corolla lobes mostly held upright, while in *H. solokensis* sp. nov. the lobes are spreading; furthermore, the corona of *H. papaschonii* has both staminal and interstaminal elements while *H. solokensis* sp. nov. only has a staminal corona. Another species with a tubular corolla is *H. telosmoides* Omlor (1996) from Borneo, that is, however, a climber. The flowers of *H. solokensis* sp. nov. superficially resemble those of the Bornean *H. hamiltoniorum* A.L.Lamb, Gavrus, Emoi & Gokusing (Lamb *et al.* 2014) because both species have the free part of the corolla lobes spreading, however *H. hamiltoniorum* is a climber and its inner apex of the corona lobe is bifid, while the apex of the inner lobes of *H. solokensis* sp. nov. is entire.

*Hoya sumatrana* S.Rahayu & Rodda sp. nov.

[urn:lsid:ipni.org:names:77195002-1](http://urn:lsid:ipni.org:names:77195002-1)

Figs 3–4

### Etymology

The new species is named after the Indonesian island of Sumatra.

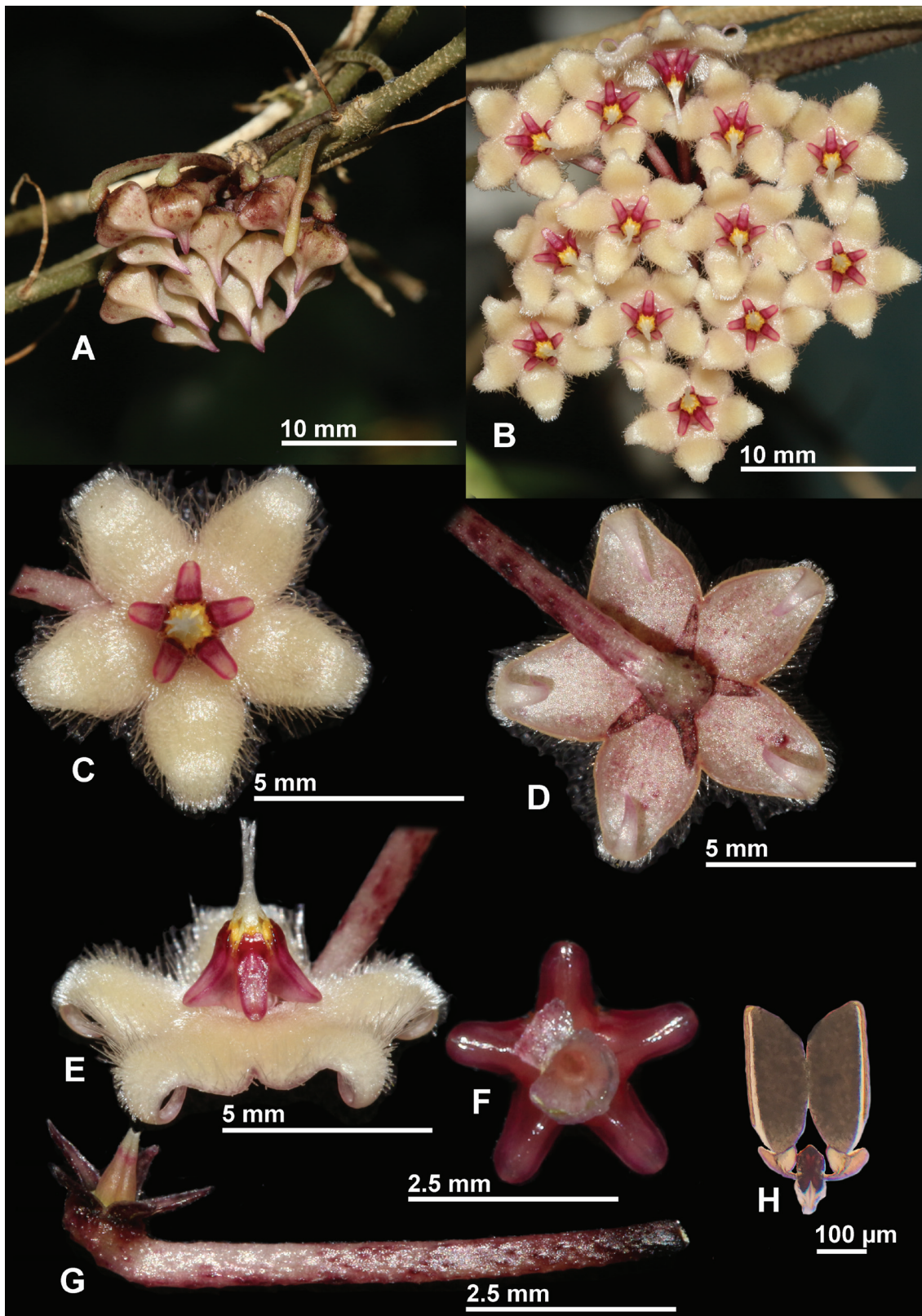
### Type material

#### Holotype

INDONESIA • Sumatra, Lampung, Taman Nasional Bukit Barisan Selatan, Tambling; 20 Sep. 2013; S. Rahayu 861 leg.; lowland forests; BO.

#### Isotype

INDONESIA • Same data as for the holotype; SING.



**Fig. 3.** *Hoya sumatrana* S.Rahayu & Rodda sp. nov. **A.** Buds. **B.** Inflorescence, from underneath. **C.** Flower, from top. **D.** Corolla, from underneath, calyx and pedicel. **E.** Flower, side view. **F.** Corona, from underneath. **G.** Pedicel, calyx and ovaries. **H.** Pollinarium. Photos: M. Rodda.



### Description

Epiphytic climber, with white or yellowish latex in all vegetative parts. Roots adventitious below the nodes and along the internodes. Stems 2–4 mm in diameter, climbing, dull green, pubescent; older stems grey, glabrescent; internodes 2–5(10) cm. Leaf blades 3–7(15) × 3.5–5.5 cm, stiff and succulent, oblong, ovate or elliptic, base round to attenuate, apex acute, mid green on adaxial surface with sparse grey spots, pale green on abaxial surface, glabrous, or very sparsely pubescent when young, venation pinnate, inconspicuous, basal colleter ca 1 × 1.5 mm, one at each lamina base, broadly triangular, pale brown; petioles 10–20 × 3–6 mm, terete, dark brown, sparsely pubescent when young. Inflorescences 2.5–3 cm in diameter, of 10–15 flowers, sciadioidal, flat; peduncles 15–35 × 1.5–2 mm, extra-axillary, positively geotropic, 1 at each node, producing flowers over an extended period of time, terete, dark red, sparsely pubescent. Flowers with terete pedicels 5–15 × 0.7–1 mm, dark red at the base, fading to pale pink towards the calyx, sparsely papillose. Calyx lobes narrowly triangular, spaced 0.6–0.8 mm apart, apex acute or rounded, 1.4–2 × 0.5–0.8 mm, reddish, papillose outside, inside glabrous, sparsely ciliate; basal colletes 0.16–0.18 × 0.09–0.11 mm, one at each calyx sinus, ovoid. Corolla 7–9 mm in diameter when flattened, rotate; tube ca 1.5 mm long, cream, glabrous outside, densely pubescent inside; lobes triangular, valvate in bud, with recurved edges and revolute tip, 5–6 × 2–3 mm, glabrous outside, densely pubescent inside with a glabrous tip ca 1.5 mm long. Corona staminal 2–2.5 mm high, 2.8–3.2 mm in diameter, red; lobes ca 2.2 × 0.8 mm, attached at the back of the anthers, held at ca 60° angle, ovoid, slightly carinate



**Fig. 4.** *Hoya sumatrana* S.Rahayu & Rodda sp. nov. **A–B.** Leaves from above. **C–D.** Leaves from from underneath. Photos: M. Rodda.

above, inner process bilobed, outer process rounded, with a narrow basal revolute margin. Anthers ca  $0.5 \times 0.4$  mm, ovate, with a linear apical round membranaceous appendage to 2.8 mm long. Pollinia  $280\text{--}320 \times 100\text{--}120$   $\mu\text{m}$ , oblong, with a round base and obliquely truncate; pellucid margin all along the outer edge; caudicles  $100\text{--}120 \times 70$   $\mu\text{m}$ , broad, almost transparent; corpusculum  $90\text{--}110 \times 40\text{--}60$   $\mu\text{m}$ , oblong; style-head 5-angled in cross section, with five spreading lobes alternating with the stamens, style-head apex 0.8–0.9 mm long, 0.4–0.5 mm broad at the base, conical, with apex acute; ovary 1.5–2  $\times$  ca 0.5 mm at the base, conical, with apex acute. Fruit and seed not observed.

### Distribution and habitat

*Hoya sumatrana* sp. nov. is only known from the type locality in in Lampung, Sumatra, Indonesia. It was collected in a coastal swamp forest, where it was growing as an epiphyte.

### Conservation status

Known only from a single collection and lacking information on the distribution area, the population size and the possible threats to the habitat, *H. sumatrana* sp. nov. is considered as Data Deficient (DD) (IUCN 2012).

### Notes

*Hoya sumatrana* sp. nov. is a new species in *H.* sect. *Peltostemma* Schlechter (1916: 14), characterized by upright corona lobes, long linear anther appendages extending well above the style-head and pollinaria with well developed caudicle wings. This section includes six species, two of which, *H. soidaoensis* Kidyoo (2013) and *H. phuwuaensis* Kidyoo (2016), have been recently published. *Hoya sumatrana* sp. nov. can be separated from all other members of this section because its flowers are much smaller; for example, the corolla of *H. sumatrana* sp. nov. is 7–9 mm in diameter, while the corolla of the second smallest species, *H. flagellata* Kerr (1940: tab. 3407), is  $> 10$  mm in diameter, as well as the corona of *Hoya sumatrana* sp. nov. is 2.8–3.2 mm in diameter, while that of *H. flagellata* is  $> 4$  mm in diameter. Another useful character to separate *H. sumatrana* sp. nov. from all other members of the section is the inner corona lobe process, that is bilobed in *H. sumatrana* sp. nov., while the other species have acute or rounded processes.

### *Hoya uncinata* Teijsm. & Binn.

*Natuurkundig Tijdschrift voor Nederlandsch Indië* 25: 408 (Teijsmann & Binnendijk 1863).

### Synonym

*H. padangensis* Schltr., *Beihefte zum Botanischen Centralblatt* 34 (2): 15 (Schlechter 1916). Type: INDONESIA • Sumatra, auf Bäumen bei Padang; 900 m a.s.l.; 20 Jan. 1907; R. Schlechter 15916 leg.; B100277224 (lectotype, designated by Rodda & Rahayu 2018).

### Original citation

“In silvis Javae et Sumatrae ins. prov. Palembang” (type material not traced).

### Type material

**Neotype** (designated by Rodda & Rahayu 2018)  
INDONESIA • Sumatra, “auf Bäumen bei Padang”; 900 m a.s.l.; 20 Jan. 1907; R. Schlechter 15916 leg.; B100277224.



***Hoya verticillata*** (Vahl) G. Don

*A General History of the Dichlamydeous Plants* 4: 128 (Don 1837) — *Sperlingia verticillata* Vahl, *Skriver af Naturhistorie-Selskabet* 6: 113 (Vahl 1810).

**Type material**

**Lectotype** (designated by Veldkamp *et al.* 1995)

INDIA • “Hb. Vahl. *Cynanchum?* Floer ex Ind. Orient.”; C10006735.

**Possible islectotype**

INDIA • “Hb. Vahl. *Sperlingia tetraphylla Cynanchum?* Floer ex Ind. Orient.”; C10006736.

***Hoya vitellinoides*** Bakh.f.

*Blumea* 6: 381 (Bakhuizen van den Brink 1950).

**Type material**

**Holotype**

INDONESIA • Java, Gunung Tjipoeli bij Tjampea; 800 m a.s.l.; 24 Sep. 1920; Bakhuizen van den Brink 4181 leg.; L0004347.

***Hoya vitellina*** Blume

*Museum Botanicum Lugduno-Batavum* 1: 45 (Blume 1849a).

**Type material**

**Lectotype** (designated by Rodda 2017)

INDONESIA • West Java; C. L. Blume [?] s.n. leg.; L0004346.

**Possible islectotypes**

INDONESIA • Same data as for the lectotype; BO1869758, BO1869758, U1102651.

***Hoya wrayi*** King & Gamble

*Journal of the Asiatic Society of Bengal* 74 (2): 579 (King & Gamble 1908).

**Type material**

**Lectotype** (designated by Rodda & Simonsson Juhonewe 2012)

MALAYSIA • Perak, Gunung Batu Pateh; 4300 ft; Wray 371 leg.; K.

**Epitype** (designated by Rodda & Simonsson Juhonewe 2012)

MALAYSIA • Pahang, Fraser Hill; Feb. 1976; R.E. Rintz RER23 leg.; K (spirit material).

**Isoepitype**

MALAYSIA • Same data as for the epitype; K (pressed material).

## Discussion

Since Rahayu & Wanntorp (2012), the Sumatran specimens identified as *H. erythrostemma* Kerr (1939) have been identified as *H. rintzii*, *H. micrantha* Hook.f. (Hooker 1883) has been re-determined as *H. rundumensis*, and *H. verticillata* was reported as *H. parasitica* Wall. ex Wight (1834). Nine species have been added to the inventory of Sumatran *Hoya* (Rahayu & Wanntorp 2012), all described based on Sumatran collections. These are *H. andalensis*, *H. beccarii*, *H. brooksii*, *H. deykeae*, *H. omlorii*, *H. parvifolia*, *H. purpurascens*, *H. sarcophylla*, and *H. uncinata*.

*Hoya variifolia* is considered a new synonym of *H. parviflora*. Two further species, *H. glabra* Schltr (Schlechter 1908) and *H. kastbergii*, are newly recorded.

The total count of taxa of *Hoya* known from Sumatra now stands at 43 and includes 41 species and two subspecies.

## Acknowledgments

We thank the directors and curators of the B, BO, BM, K, and SING herbaria for loans of specimens and access to the material studied. The National Parks Board Singapore is acknowledged for supporting numerous study trips to herbaria in SE Asia and Europe (MR). We are very grateful to Amar Husein Sitompul and Fadly for collecting some of the specimens cited in the paper, and to Dr. Frederik Leliaert, Dr. Koen Martens and Dr. Alejandro Quintanar for their editorial work on the paper.

## References

- Anonymous 2001. Our cover story: Genus *Eriostemma* (Schlechter) Kloppenburg & Gilding. *Fraterna* 14 (2): 1–4.
- Anonymous 2003. New Borneo *Hoya* species. *Fraterna* 16 (4): 1–5.
- Anonymous 2005. *Hoya andalensis* Kloppenburg. *Fraterna* 18 (1): 1–5.
- Bakhuizen van den Brink R.C. 1950. Notes on the Flora of Java, VI. *Blumea* 6: 363–406.
- Blume C.L. 1823. *Catalogus van eenige der merkwaardigste zoo in-als uit-heemsche gewassen, te vinden in 's lands plantentuin te Buitenzorg*. Ter Lands Drukkerij, Batavia.
- Blume C.L. 1826. *Bijdragen tot de flora van Nederlandsch Indië*. Ter Lands Drukkerij, Batavia.
- Blume C.L. 1849a. *Museum Botanicum Lugduno-Batavum*. Vol. 1. E.J. Brill, Lugdunum, Batavia.
- Blume C.L. 1849b. *Rumphia*. Vol. 4. C.G. Sulpke, Leiden, Amsterdam.
- Brown R. 1810. *Prodromus Florae Novae Hollandiae et Insulae Van Diemen*. Richard Taylor *et al.*, London. <https://doi.org/10.5962/bhl.title.3633>
- Decaisne J. 1838. Etudes sur quelques genres et espèces de la famille des Asclepiadees. *Annales des Sciences naturelles, Botanique, sér. 2*, 9: 257–278.
- Decaisne J. 1844. Asclepiadeae. In: de Candolle A.L.P.P. (ed.) *Prodromus Systematis Naturalis Regni Vegetabilis* 8: 490–665. Fortin, Masson *et sociorum*, Paris.
- Don G. 1837. *A General History of the Dichlamydeous Plants*. Vol. 4. J.G. Rivington and F. Rivington, London.
- Forster P.I. & Liddle D.J. 1992b. Taxonomic studies on the genus *Hoya* R.Br. (Asclepiadaceae) in Papuaia 4. Typification and synonymy of *Hoya revoluta* Wight ex J.D. Hook. *Austrobaileya* 3: 638–639.

- Green T. 2000. *Hoya deykei* Green sp. n. (Asclepiadaceae). *Fraterna* 13 (1): 15–16.
- Green T. 2004. Our Cover Story. *Hoya sigillatis* Green (Asclepiadaceae Sp. Nova. *Fraterna* 17 (3): 2–4.
- Green T. 2010. New subspecies of *Hoya* from Rundum, Sabah, Malaysia. *Asklepios* 108: 19–21.
- Hasskarl C. 1843. Adnotationes de Plantis quibusdam Javanicis nonnullisque japonicis, haud rite cognitae, e Catalogo Horti Bogoriensis excerptae. Accedunt nunnulae Novae Species. In: van der Hoeven J. & De Vriese W.H. (eds.) *Tijdschrift voor Natuurlijke Geschiedenis en Physiologie* 10: 115–150.
- Heynhold J. 1840. *Nomenclator Botanicus Hortensis*. Arnold'schen Buchhandlung, Dresden.
- Hooker J.D. 1883. *The Flora of British India* 4: 1–78. L. Reeve, London.
- Hooker W.J. 1850. *Hoya purpureofusca*. *Botanical Magazine* 76: tab. 4520.
- IUCN 2012. *IUCN Red List Categories and Criteria* (version 3.1, 2<sup>nd</sup> edition). IUCN, Gland, Switzerland and Cambridge, UK.
- Kerr A.F.G. 1939. Contributions to the Flora of Siam. Additamentum LII. *Bulletin of Miscellaneous Information* 1939: 456–465. <https://doi.org/10.2307/4113547>
- Kerr A.F.G. 1940. *Hoya mitrata* & *Hoya flagellata*. *Hooker's Icones Plantarum* 35: tab. 3406–3407.
- Kidyoo M. 2013. *Hoya soidaoensis* (Apocynaceae: Asclepiadoideae), a new species from southeastern Thailand. *Phytotaxa* 105 (2): 45–50. <https://doi.org/10.11646/phytotaxa.105.2.3>
- Kidyoo M. 2016. *Hoya phuwuensis* (Apocynaceae: Asclepiadoideae), a new species from Northeastern Thailand. *Phytotaxa* 282 (3): 218–224. <https://doi.org/10.11646/phytotaxa.282.3.5>
- King G. & Gamble J. 1908. Flora of the Malayan Peninsula. *Journal of the Asiatic Society of Bengal* 74 (2): 559–580.
- Kleijn D. & van Donkelaar R. 2001. Notes on the taxonomy and ecology of the genus *Hoya* (Asclepiadaceae) in Central Sulawesi. *Blumea* 46: 457–483.
- Kloppenborg R.D 2001. New Synonyms and Combinations. *Fraterna* 14 (1): 11–14.
- Lamb A. & Rodda M. 2016. *A Guide to Hoyas of Borneo*. Natural History Publications Borneo, Kota Kinabalu.
- Lamb A., Gavrus A., Emoi B. & Gokusing L. 2014. The Hoyas of Sabah, a commentary with seven new species and a new subspecies. *Sandakania* 19: 1–89.
- Lindley J. 1846. New garden plant. *Hoya imperialis*. *Edwards's Botanical Register* 32: tab. 68.
- Meve U., Laurente O., Alejandro G.J. & Livschultz T. 2009. Systematics of *Clemensiella* (Apocynaceae – Asclepiadoideae). *Edinburgh Journal of Botany* 66 (3): 447–457. <https://doi.org/10.1017/S0960428609990059>
- Miquel F.E.W. 1857. *Flora van Nederlandsch Indië*. Vol. 2. C.G. van der Post, Amsterdam.
- Omlor R. 1996. Notes on *Marsdenieae* (Asclepiadaceae): A new, unusual species of *Hoya* from Northern Borneo. *Novon* 6: 288–294. <https://doi.org/10.2307/3392096>
- Rahayu S. & Wanntorp L. 2012. Notes on the species diversity of *Hoya* (Apocynaceae – Asclepiadoideae) of Sumatra. *Asklepios* 113: 17–26.
- Ridley H.N. 1917. Spermatophyta and Pteridophyta. *Journal of the Federated Malay States Museums* 8 (4): 13–136.
- Ridley H.N. 1923. A botanical excursion to northern Sumatra. *Journal of the Malayan Branch of the Royal Asiatic Society* 1: 46–113.

- Ridley H.N. 1925. Plants from Bencoolen, Sumatra. Collected by Mr. C.J. Brooks. *Bulletin of Miscellaneous Information* 1925: 76–94. <https://doi.org/10.2307/4107521>
- Ridley H.N. 1926. The Flora of the Mentawi Islands. In: Boden Kloss C., Spolia Mentawiensia. *Bulletin of miscellaneous information, Royal Gardens, Kew* 1926: 57–94.
- Rintz R.E. 1978. The Peninsular Malaysian species of *Hoya* (Asclepiadaceae). *Malayan Nature Journal* 30: 467–522.
- Rodda M. 2017. Index of names and types of *Hoya* (Apocynaceae: Asclepiadoideae) of Borneo. *Gardens' Bulletin Singapore* 69 (1): 33–65. [https://doi.org/10.26492/gbs69\(1\).2017-02](https://doi.org/10.26492/gbs69(1).2017-02)
- Rodda M. & Ercole E. 2014. *Hoya papaschonii* (Apocynaceae: Asclepiadoideae), a new species from southern Thailand with a peculiar corona. *Phytotaxa* 175 (2): 97–106. <https://doi.org/10.11646/phytotaxa.175.2.4>
- Rodda M. & Nyhuus T. 2009. *Hoya danumensis*, a new species of *Hoya* (Apocynaceae, Asclepiadoideae) from Borneo. *Webbia* 64: 163–167. <https://doi.org/10.1080/00837792.2009.10670856>
- Rodda M. & Rahayu S. 2018. A revision of the *Hoya uncinata* complex (Apocynaceae, Asclepiadoideae), with description of a new species. *Phytotaxa* 383 (3): 252–258. <https://doi.org/10.11646/phytotaxa.383.3.2>
- Rodda M. & Simonsson Juhonewe N. 2012. *Hoya somadeeae* sp. nov. (Apocynaceae, Asclepiadoideae) Thailand and lectotypification of *Hoya wrayi*. *Nordic Journal of Botany* 30: 578–584. <https://doi.org/10.1111/j.1756-1051.2011.01400.x>
- Rodda M. & Simonsson Juhonewe N. 2013. The taxonomy of *Hoya micrantha* and *Hoya revoluta* (Apocynaceae, Asclepiadoideae). *Webbia* 68: 7–16. <https://doi.org/10.1080/00837792.2013.802937>
- Rodda M., Simonsson Juhonewe N. & Rahayu S. 2014. Taxonomic revision of the *Hoya mindorensis* complex (Apocynaceae: Asclepiadoideae). *Webbia* 69: 39–47. <https://doi.org/10.1080/00837792.2014.900261>
- Rodda M., Simonsson Juhonewe N. & Middleton D.J. 2016. The taxonomic status of the presumed extinct Singaporean *Hoya wallichii* (Apocynaceae: Asclepiadoideae). *Gardens' Bulletin Singapore* 68: 175–187.
- Rodda M., Lamb A.L., Gokusing L. & Rahayu S. 2018. *Hoya fauziana* ssp. *angulata* (Apocynaceae, Asclepiadoideae), a new subspecies from Borneo and Sumatra. *Blumea* 63: 144–146. <https://doi.org/10.3767/blumea.2018.63.02.10>
- Rumphius G.E. 1747. *Herbarium Amboinense*. Vol. 5. J. Burman, Amsterdam.
- Schlechter R. 1908. Beiträge zur Kenntnis der Asclepiadaceen des Monsun-Gebietes. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 40 (92): 1–19.
- Schlechter R. 1916. Neue Asclepiadaceen von Sumatra und Celebes. *Beihefte zum Botanischen Centralblatt* 34 (2): 1–18.
- Teijsmann J.E. & Binnendijk S. 1863. Plantae novae in horto bogoriensi cultae. *Natuurkundig Tijdschrift voor Nederlandsch Indië* 25: 399–428.
- Teijsmann J.E. & Binnendijk S. 1866. *Catalogus Plantarum quae in Horto Botanico Bogoriensi coluntur*. Lands-Drukkerij, Buitenzorg, Batavia.
- Thiers B. 2019. *Index Herbariorum: A Global Directory of public Herbaria and associated Staff*. New York Botanical Garden's Virtual Herbarium, New York. Available from <http://sweetgum.nybg.org/science/ih/> [accessed 13 Feb. 2019].

Turner I.M., Low Y.W., Rodda M., Wong K.M. & Middleton D.J. 2018. The plant taxa of H.N. Ridley, 5. The Gentianales. *Gardens' Bulletin Singapore* 70 (2): 307–395. [https://doi.org/10.26492/gbs70\(2\).2018-08](https://doi.org/10.26492/gbs70(2).2018-08)

Vahl M. 1810. Beskrivelse over nye Planteslægter. *Skrivter af Naturhistorie-Selskabet* 6: 84–128.

Wanntorp L. & Meve U. 2011. New combinations in *Hoya* for the species of *Clemensiella* (Marsdenieae, Apocynaceae). *Willdenowia* 41: 97–99. <https://doi.org/10.3372/wi.41.41110>

Veldkamp J.F., van Donkelaar R. & Kloppenburg R.D. 1995. The identity of *Sperlingia* Vahl (Asclepiadaceae). *Blumea* 40: 425–428.

Wight R. 1834. *Contributions to the Botany of India*. Parbury, Allen *et al.*, London.

*Manuscript received: 30 July 2018*

*Manuscript accepted: 21 January 2019*

*Published on: 23 March 2019*

*Topic editor: Frederik Leliaert*

*Desk editor: Alejandro Quintanar*

Printed versions of all papers are also deposited in the libraries of the institutes that are members of the *EJT* consortium: Muséum national d'Histoire naturelle, Paris, France; Meise Botanic Garden, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Royal Belgian Institute of Natural Sciences, Brussels, Belgium; Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Real Jardín Botánico de Madrid CSIC, Madrid, Spain; Zoological Research Museum Alexander Koenig, Bonn, Germany.