



A new species of *Hoya* (Marsdenieae), three new combinations and two new names in *Vincetoxicum* (Asclepiadeae) from Thailand

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ABSTRACT: *Hoya phuluangensis* Kidyoo, a new species from northeastern Thailand is here described and compared to the similar species, *H. rostellata* and *H. siamica*. All three species have glabrous stems and branches, glabrous coriaceous leaves, adaxially puberulent ovate corolla lobes with an acute apex, and flat to slightly erect coronal scales with an obtuse or rounded apex. However, *H. phuluangensis* differs from the other two species in the following characters: flowers with a shallow cup-shaped corolla tube and a corona diameter measuring less than half of the corolla tube diameter. Full description of *H. phuluangensis* is provided, together with line drawings and photographs. In addition, three new combinations and two new names in the genus *Vincetoxicum*, namely *V. indicum* (Burm.f.) Mabb. var. *glabrum* (Decne.) A. Kidyoo, *V. kerrii* (Craib) A. Kidyoo, *V. sootepense* (Craib) A. Kidyoo, *V. lindleyi* A. Kidyoo and *V. potamophilum* A. Kidyoo, are proposed.

KEY WORDS: Apocynaceae, Asclepiadoideae, Hill evergreen, *Hoya phuluangensis*, Thailand, *Vincetoxicum*.

INTRODUCTION

The subfamily Asclepiadoideae (Apocynaceae) is one of the most derived plant groups, comprising about 164 genera with around 3000 species (Endress *et al.*, 2014). The members of the subfamily are well characterized by the possession of pollinarium (Endress and Bruyns, 2000), enabling the plants to adapt to more specific pollination mediated by animals. *Hoya* R. Br. belongs to the tribe Marsdenieae Benth. and includes more than 200 species widely occurring from China throughout southeast Asia and to Oceania (Wanntorp *et al.*, 2006). It is presumably the third most species-rich genera of the subfamily, after *Ceropegia* (Ceropegieae – Stapeliinae) with 717 species (according to the recent phylogenetic reconstructions in the Ceropegieae by Bruyns *et al.* (2017), the former *Brachystelma* and the stapeliads were placed in the greatly enlarged *Ceropegia*), and *Matelea* (Asclepiadeae - Gonolobinae) with about 280 species (Liede-Schumann and Meve, 2006). *Hoya* species are typically epiphytic or lithophytic climbers with slender twining stems, succulent opposite leaves, and often with milky white or rarely clear sap in all parts. Their pentamerous flowers are aggregated in an umbelliform (sciadioidal) inflorescence (Rintz, 1978; Kidyoo, 2016). They are further characterized by a showy, mostly stellate, nectar-secreting staminal corona. Each pollinium is provided with a pellucid margin sometimes extending over the dorsal margins (Wanntorp and Forster, 2007). Because of its very wide geographical range of distribution and the extensive variation in shape and size of flowers, *Hoya* still has an unclear taxonomic boundary and remains one of the most difficult genera

to study (Kidyoo, 2016; Kunze and Wanntorp, 2008; Omlor, 1998; Wanntorp and Kunze, 2009).

Vincetoxicum Wolf is another genus with a very confused history. This genus was once subsumed under *Cynanchum* L. (Asclepiadeae: Cynanchinae) (Li *et al.*, 1995), but subsequent cladistic analysis (Liede, 1996) supported that it is a well separate genus. Further molecular phylogenetic and intensive morphological studies have revealed that *Vincetoxicum* is not closely related to *Cynanchum*, but instead forms a monophyletic clade with *Tylophora* R. Br., a large (about 150 species) tropical and subtropical Old World genus of rather vague circumscription (Yamashiro *et al.*, 2004, Liede and Kunze, 2002; Yamashiro *et al.*, 2008; Liede-Schumann *et al.*, 2012; Liede-Schumann *et al.*, 2016). As a consequence, *Vincetoxicum* and *Tylophora*, recently placed in the subtribe Tylophorinae of the tribe Asclepiadeae, have been merged into a single genus. As *Vincetoxicum* Wolf predates *Tylophora* R. Brown, the correct name of the genus is *Vincetoxicum* according to the rule of priority, and thereby the genus in this present circumscription comprises about 140 species, naturally occurring in Asia, Africa, and Europe (Liede-Schumann *et al.*, 2016). Its members are recognized by clear latex (in almost all taxa except for some species of the former *Tylophora*, which have whitish or yellowish latex), and the rather small and inconspicuous flowers with five mostly separate staminal corona lobes and small, round pollinia attached to the corpusculum via cylindrical caudicles (Yamashiro *et al.*, 2008; Liede-Schumann *et al.*, 2016). After the incorporation of *Tylophora* into *Vincetoxicum*, a lot of new combinations or new names are necessary.

In Thailand, 48 species of *Hoya* (Kidyoo, 2015,



2016) and 12 species of *Tylophora-Vincetoxicum* complex (A. Kidyoo, 2016; O. Thaithong, unpublished data) are known. During recent comprehensive taxonomic revisions of Asclepiadoideae in Thailand, an unknown *Hoya* plant was found at Phu Luang Wildlife Sanctuary located in the northeastern region, and was identified as a new species. It is here named *Hoya phuluangensis* Kidyoo. Moreover, the problematic *Tylophora-Vincetoxicum* complex was disentangled, and thereby the taxonomic status and the nomenclature of its members were found in need to be amended. As a result, three new combinations and two new names are here suggested.

TAXONOMIC TREATMENT

Hoya phuluangensis Kidyoo, *sp. nov.* Fig. 1 & 2

Type: THAILAND. Loei province, Phu Luang Wildlife Sanctuary, 1,400 m a.s.l., 11 May 2008, *M. Kidyoo 1014* (holotype BKF, isotype BCU).

Hoya phuluangensis is distinguished from *H. rostellata* by a flower with corolla lobes not reflexed when in full bloom and with slightly revolute margins, shallow cup-shaped corolla tube, and corona diameter less than half of the corolla tube diameter. In contrast, *H. rostellata* has corolla lobes with strongly revolute margins and apex, corolla tube spreading in a flat form, and corona of diameter more than half of the corolla tube diameter.

Climbing epiphyte with white latex in all parts. Stem and branches cylindrical, 2.5–3.5 mm in diam., green or greenish brown with age, glabrous, internodes 2–14 cm long. Leaves opposite; petiole cylindrical, glabrous, 1–2.5 cm long, 2.2–3 mm in diam.; blade thick, rigid, coriaceous, obovate or oblanceolate, 5.7–12 × 2.4–3 cm; margins entire; adaxial surface green, glabrous; abaxial surface pale green, glabrous; apex acuminate, slightly recurved; base acute to obtuse with a small colleter, 0.4–0.6 × 0.6–0.8 mm; midrib and nerves inconspicuous on both sides, lateral veins in 5–6 pairs, branching off midrib in an acute angle. Inflorescences extra-axillary, 3–10-flowered, peduncles very short, perennial, 0.5–1 cm long, 2–2.5 mm in diam., glabrous; bracts pink, triangular, apex acute, ca. 0.5 mm long; pedicels 1.8–2.2 cm long, 1.5–1.7 mm in diam., glabrous, pinkish white with scattered reddish purple spots. Calyx creamy to pinkish white, lobes 5, nearly divided to the base, ovate-triangular, 1.3–1.6 × 1.2–1.5 mm, apex acute, abaxial surface glabrous, adaxially with a small basal gland between lobes. Corolla rotate, white or creamy or pinkish white, waxy, 2.3–2.7 cm in diam., adaxial surface puberulent except at the apex of the corolla lobe, abaxial surface glabrous; corolla tube shallowly cup-shaped, 8.8–9 mm long; corolla lobes ovate-triangular, 6.9–8.2 × 9.5–11 mm, spreading when in full bloom; margins slightly revolute;

apex acute, slightly revolute. Corona less than half the size of the corolla, 7.8–8 mm in diam.; coronal scales white, fleshy, obovate, 3.5–3.6 × 2.5–2.7 mm, upper surface slightly concave, lower surface sulcate with short trichomes at base, outer angle slightly raised with rounded apex; inner angle raised up higher than the outer angle, apiculus of the inner angle acute and pale pink in color; anther appendages yellowish white. Pollinia obliquely oblong, yellow, 0.81–0.83 × 0.29–0.32 mm, apex truncate, pellucid margins extending over the dorsal margins of the pollinia; translator arms stout, hyaline, 0.21–0.23 mm long; corpusculum dark brown, broadly obovate, 0.50–0.57 × 0.29–0.32 mm. Carpels ovoid, glabrous, ca. 2 mm long, ca. 1 mm in diam.; style-head conical, pentagonal. Follicles single or paired, fusiform, 10–11 cm long, 4–5 mm in diam. Seeds ovate-elliptic, 3–3.5 × 1.3–1.6 mm; coma 2–2.5 cm long.

Ecology and distribution: This plant usually grows in shady areas in hill evergreen forest from 1,400 m a.s.l., climbing on tree trunks and branches.

Additional specimens examined (paratype): **Thailand:** *M. Kidyoo 1053*, Phu Luang Wildlife Sanctuary, Loei province, 1,400 m a.s.l., 10 December 2008 (BCU).

Etymology: The specific epithet of the new species is derived from ‘Phu Luang Wildlife Sanctuary’, the place where it was first discovered.

Similar species and diagnostic characters: *Hoya phuluangensis* is most similar to *H. rostellata* Kidyoo and *H. siamica* Craib. These three species have many features in common, i.e. climbing epiphyte with twining glabrous stems and branches, milky latex in all parts, glabrous coriaceous leaves, rotate corolla, ovate corolla lobes with an acute apex and puberulent adaxial surface, flat to slightly erect coronal scales with an obtuse or rounded apex. However, *H. phuluangensis* is clearly distinguished from the other two species by characteristics of leaves and flowers (Fig. 3). *Hoya phuluangensis* and *H. rostellata* produce obovate to oblanceolate leaves which are usually obtuse at the base, aristate to acuminate and recurved at the apex, and with the obscure veins on both sides. On the contrary, *H. siamica* has ovate, lanceolate or elliptic leaves with a cuneate or attenuate base and acute to acuminate apex. Its leaf veins are grooved and clearly visible on the adaxial surface of the blade. Moreover, *H. phuluangensis* is slightly different from *H. rostellata* with regard to the petiole. Whereas *H. phuluangensis* has a slender petiole of 1–2.5 cm length and 2.2–3 mm diameter, *H. rostellata* has a stout petiole of 0.8–1.5 cm length and 3–4 mm diameter. Comparison of flower characteristics shows that *H. phuluangensis* can be clearly separated from the two similar species by its inflorescence with a very short peduncle (0.5–1 cm long, 2–2.5 mm in diam.), the spreading corolla lobes

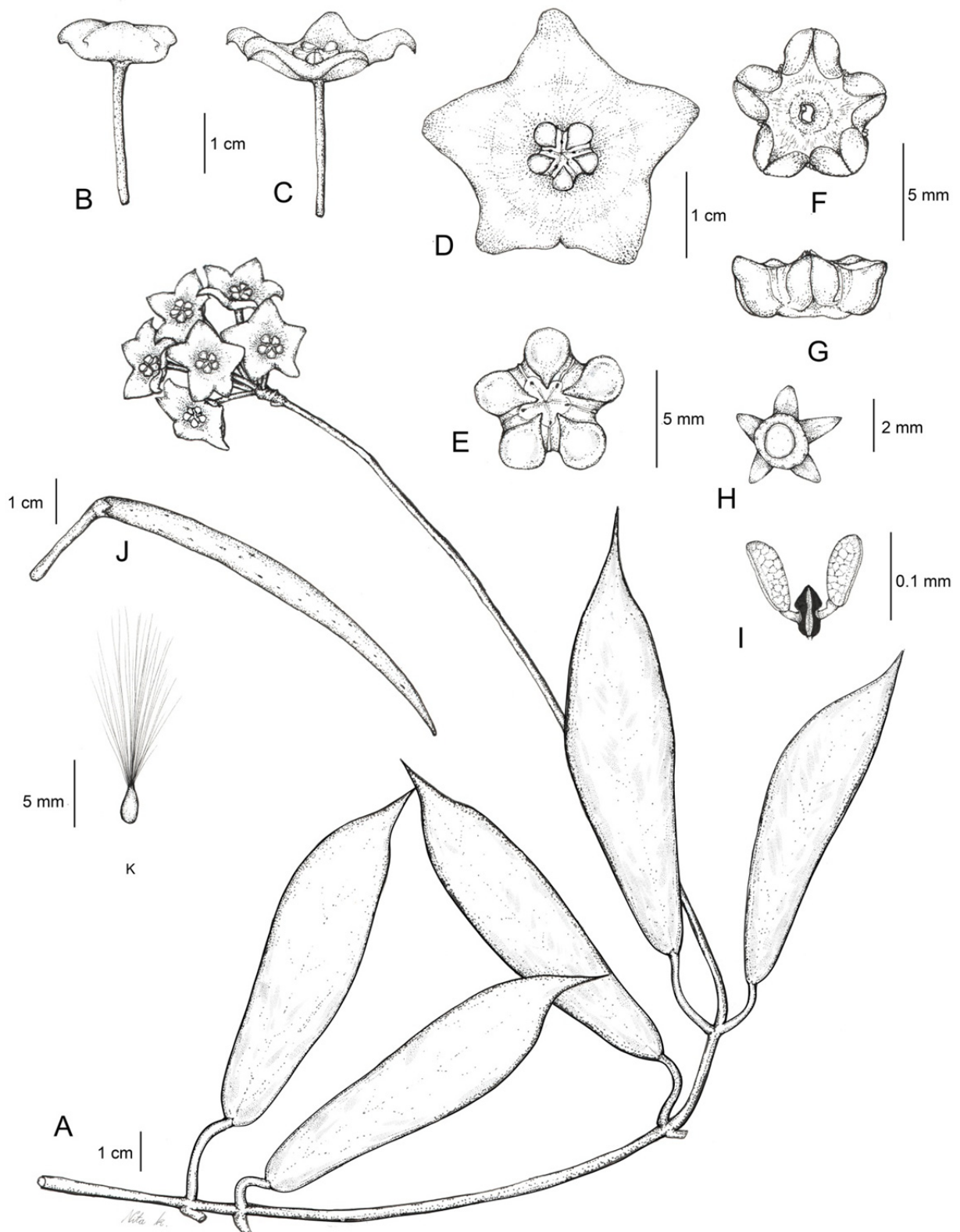


Fig. 1. Line drawings of *Hoya phuluangensis* Kidyoo. **A:** Flowering branch. **B:** Flower bud. **C:** Blooming flower, side view. **D:** Blooming flower, top view. **E:** Corona, top view. **F:** Corona, bottom view. **G:** Corona, side view. **H:** Calyx. **I:** Pollinarium. **J:** Follicle. **K:** Seed. Drawn by Nita Kidyoo from *M. Kidyoo 1014*, *M. Kidyoo 1053*.

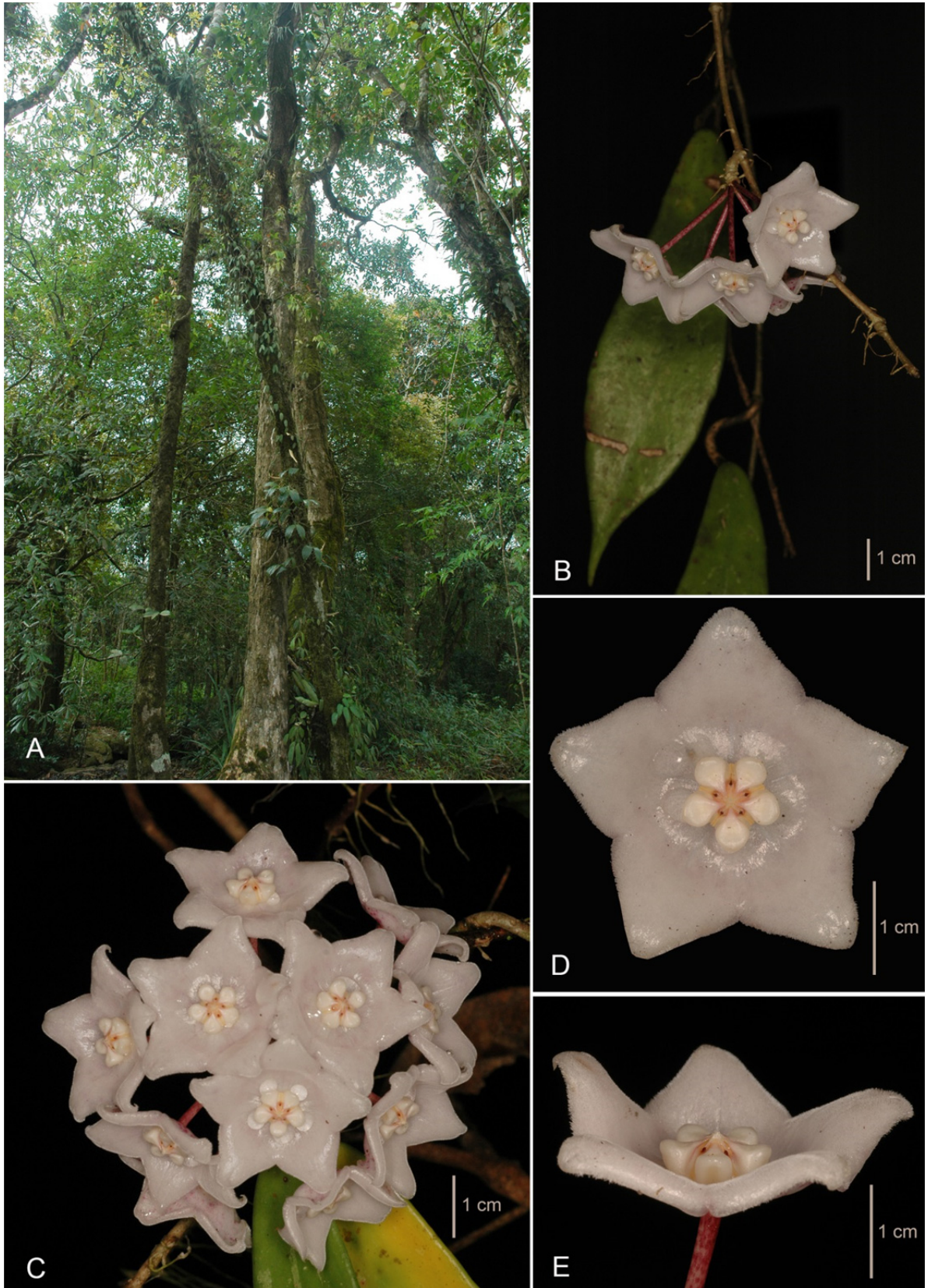


Fig. 2. Photographs of *Hoya phuluangensis* Kidyoo. A: Habitat. B: Flowering branch. C: Inflorescence. D: Flower, top view. E: Flower, side view. All photographs by M. Kidyoo.



Fig. 3. Comparison between **A & D:** *Hoya phuluangensis* Kidyoo, **B & E:** *H. rostellata* Kidyoo, and **C & F:** *H. siamica* Craib. **A – C:** Flower, **D – F:** Leaf. All photographs by M. Kidyoo.

with slightly revolute margins, the shallow cup-shaped corolla tube, and the corona diameter being less than half of the corolla tube diameter. Moreover, the flowers of *H. phuluangensis* (2.3–2.7 cm in diam.) are one and a half times larger than those of *H. rostellata* (1.4–1.7 cm in diam.) and *H. siamica* (1.5–1.7 cm in diam.).

Hoya rostellata, unlike *H. phuluangensis*, produces inflorescence with a somewhat long and stout peduncle (0.5–2.5 cm long, 1.5–2.5 mm in diam.), the corolla lobes with strongly revolute margins and apex, and corona of diameter more than half of the corolla tube diameter. This plant usually grows on the limestone rock and climbs up on the tree in open or shady areas along the edge of evergreen forest from about 400 to 1,050 m a.s.l. (Kidyoo, 2015) where the weather is usually dry in the hot season. *Hoya siamica*, on the

other hand, is somewhat similar to *H. phuluangensis* in occurring in hill evergreen forests at more than 1,000 m a.s.l. where there are high humidity in cold weather all year round. However, *H. siamica* produces inflorescence with a long slender peduncle (1.2–7.3 cm long, 1.5–3 mm in diam.) and is totally different from *H. phuluangensis* in terms of leaf and floral characters as mentioned above.

New combinations and new names in *Vincetoxicum* from Thailand

Presently, there are a total of 12 *Vincetoxicum* species found in Thailand. Of these, 11 were formerly placed in *Tylophora*, and the other one is the recently described rheophytic erect herb, *Vincetoxicum siamicum* A. Kidyoo (A. Kidyoo, 2016). Some former *Tylophora*



species have been transferred to *Vincetoxicum* by O. Kuntze (1891), i.e. *V. belostemma* (Benth.) Kuntze, *V. fasciculatum* (Buch.-Ham. ex Wight) Kuntze, *V. flexuosum* (R. Br.) Kuntze, *V. helferi* (Hook. f.) Kuntze, *V. irrawadense* Kuntze, *V. rotundifolium* (Buch.-Ham. ex Wight) Kuntze. Recently, Mabberley (2017) proposed the combination *V. indicum* (Burm.f.) Mabb.

The necessary new combinations for the remaining species are made here, resulting in two new species combinations, one new variety combination, and two new names.

Vincetoxicum indicum (Burm. f.) Mabb. var. ***glabrum*** (Decne.) A. Kidyoo, **comb. nov.** ≡ *Tylophora indica* Merr. var. *glabra* (Decne.) H. Huber, Revis. Handb. Fl. Ceylon 1(1): 43. 1973 ≡ *T. asthmatica* (L. f.) Wight & Arn. var. *glabra* Decne., Prodr. 8: 611. 1844 – **Lectotype (designated here): INDIA.** R. Wight 1543.B (E barcode E00179775!; isolectotype: E barcode E00179776!).

Note. Decaisne indicated Wight 1543 and Wall. 8210.b as syntypes in the protologue of *T. asthmatica* var. *pubescens* in Prodr. (Candolle, A. L. P. P., 1844), but he did not mention any type of *T. asthmatica* var. *glabra*. He only stated that he had seen the specimen collected from ‘Indiâ orient. insulâ Mauritiâ, etc.’ in P. We have carefully examined all the 51 specimens of *T. asthmatica* (including all varieties) available at P. However, we could not locate any specimen labelled as *T. asthmatica* var. *glabra* and collected from the localities mentioned by Decaisne. Almost all specimens are labelled as *T. asthmatica*, except C.P.1849 [P04464908, P04464907, P03874281, P03874288] which are labelled as *T. asthmatica* var. *glabra*. However, these specimen were collected from Ceylon. We have also examined all the specimens of *T. indica* (the taxon to which *T. asthmatica* was transferred) in P, but still could not find any specimen which corresponded to that mentioned in the protologue. Moreover, within the protologue of new combination, *T. indica* (Burm. f.) Merr. var. *glabra* (Decne.) H. Huber in Revis. Handb. Fl. Ceylon (Huber, 1973), Huber stated that the nomenclatural type was not seen. We then traced back to the protologue of *T. asthmatica* (L. f.) Wight & Arn. in Contr. Bot. India (Wight, R. 1834) and found that Wight clearly cited Wight 1543.b as type of var. *glabra* (under the former *T. pubescens*, which was placed as a synonym of *T. asthmatica*). The corresponding diagnostic character and type locality indicated were consistent with those cited in the protologue of Decaisne (Candolle, A. L. P. P., 1844). Therefore, we continued to find the specimen of *T. asthmatica* var. *glabra*, collector number Wight 1543.b in other herbaria. In Edinburgh, Wight 1543.b [E00179775, E00179776] collected from ‘Peninsula Ind. orientalis.’ are labelled respectively as syntype and isosyntype of *T. asthmatica* var. *glabra*. The syntype

[E00179775] is well-preserved with inflorescences and fruit. It is thus selected as lectotype for *T. asthmatica* var. *glabra*.

Vincetoxicum kerrii (Craib) A. Kidyoo, **comb. nov.** ≡ *Tylophora kerrii* Craib, Bull. Misc. Inform. Kew 1911: 417. 1911 – **Holotype: THAILAND.** Chiang Mai: Doi Sootep, 27 Jun 1909, *A.F.G. Kerr 704* (K barcode K000545444!).

Vincetoxicum lindleyi A. Kidyoo, **nom. nov.** ≡ *Tylophora ovata* (Lindl.) Hook. ex Steud., Nomencl. Bot., ed. 2. 2: 726. 1841. ≡ *Diplolepis ovata* Lindl., Trans. Hort. Soc. London 6: 268. 1826 – **Holotype: CHINA.** 1822, *J. Potts s.n.* (K barcode K000872869!).

Blocking name. *Vincetoxicum ovatum* Benth., Fl. Austral. 4:330. 1868.

Note. The specific epithet of the replacement name is commemorative, derived from the name of John Lindley, the author who first described this plant in 1826.

Vincetoxicum potamophilum A. Kidyoo, **nom. nov.** ≡ *Tylophora riparia* Kerr, Bull. Misc. Inform. Kew 1938: 451. 1938 – **Lectotype (designated here): THAILAND.** Menam Sak, Saraburi, 40 m, 4 Jun 1923, *A.F.G. Kerr 7025A* (BK barcode BK257745!; isolectotype: BM barcode BM001014162!, K barcode K000895051!).

Blocking name. *Vincetoxicum riparium* (Tsiang & H.D. Zhang) C.Y. Wu & D.Z. Li, Acta Bot. Yunnan. 11(1): 47. 1989.

Note. Kerr specified the type of *T. riparia* as *Kerr 7025A*, Saraburi, Menam Sak, circiter 40 m. He also mentioned *Kerr 7025* collected from a different plant individual at the same locality and *Lakshnakara 975* collected from Nakawn Panom, Ban Han Pone. Of these, only three duplicates of type could be traced in BK, BM, K, and the first one is chosen as lectotype here.

The specific epithet of the replacement name ‘*potamophilum*’ (river-loving) alludes to the type locality. The plant was found close by a river.

Vincetoxicum sootepense (Craib) A. Kidyoo, **comb. nov.** ≡ *Tylophora sootepensis* Craib, Bull. Misc. Inform. Kew 1911: 417. 1911. **Holotype: THAILAND.** Chiang Mai: Doi Sootep, 7 Aug 1910, *A.F.G. Kerr 1310* (K barcode K000895050!; isotype: K barcode K000895049!, P barcode P00645874!).

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LITERATURE CITED

- Bentham, G.** 1869. *Vincetoxicum ovatum* Benth. In: Bentham, G. and Mueller, F. von (Eds.) Flora Australiensis 4. L. Reeve, London, p. 330.
- Bruyns, P.V., C. Klak and P. Hanáček.** 2017. A revised, phylogenetically - based concept of *Ceropegia* (Apocynaceae). S. Afr. J. Bot. **112**: 399-436.
- Craib, W. G.** 1911. Contributions to the Flora of Siam II. List of Siamese Plants with Descriptions of New Species. Bull. Misc. Inform. Kew **1911(10)**: 385-474.
- Endress, M.E. and P.V. Bruyns.** 2000. A revised classification of the Apocynaceae. Bot. Rev. **66(1)**:1-56.
- Endress, M.E., S. Liede-Schumann and U. Meve.** 2014. An updated classification for Apocynaceae. Phytotaxa **159(3)**: 175-194.
- Huber, H.** 1973. Apocynaceae, Periplocaceae and Asclepiadaceae. In: Abeywickrama, B. A. (Ed). A revised handbook to the flora of Ceylon, vol. 1, pt. 1. University of Sri Lanka Press, Colombo, pp. 1-57.
- Kerr, A.F.G.** 1938. *Tylophora riparia* Kerr. Asclepiadaceae. Bull. Misc. Inform. Kew: 451.
- Kidyoo, A.** 2016. *Vincetoxicum siamicum* sp. nov. (Asclepiadeae, Asclepiadoideae, Apocynaceae), a rheophyte from northeastern Thailand and preliminary observation on its *in situ* pollen germination. Phytotaxa **289(1)**: 49-58.
- Kidyoo, M.** 2015. *Hoya rostellata* (Apocynaceae: Asclepiadoideae), a new species from Thailand. Taiwania **60(1)**: 39-42.
- Kidyoo, M.** 2016. *Hoya phuwuaensis* (Apocynaceae: Asclepiadoideae), a new species from Northeastern Thailand. Phytotaxa **282(3)**: 218-224.
- Kuntze, K.E.O.** 1891. *Revisio generum plantarum* 2. Arthur Felix, Leipzig, p. 425.
- Kunze, H. and L. Wanntorp.** 2008. The gynostegium of *Hoya spartioides* (Apocynaceae Asclepiadoideae): a striking case of incongruence between molecular and phenotypic evolution. Org. Divers. Evol. **8**: 346-357.
- Li, P.T., M.G. Gilbert and W.D. Stevens.** 1995. Asclepiadaceae. In: Wu, Z.Y. and P.H. Raven (Eds). Flora of China, vol. 16. Sci. Press, Beijing & Missouri Bot. Garden Press, St. Louis, pp. 189-270.
- Liede, S.** 1996. *Cynanchum - Rhodostegiella - Vincetoxicum - Tylophora*: new considerations on an old problem. Taxon **45(2)**: 193-211.
- Liede, S.** 1999. The genera *Cynanchum* and *Vincetoxicum* (Apocynaceae-Asclepiadoideae) in Malesia. Blumea **44**: 471-495.
- Liede, S. and H. Kunze.** 2002. *Cynanchum* and the Cynanchinae (Apocynaceae -Asclepiadeae) - a molecular, anatomical and latex triterpenoid study. Org. Divers. Evol. **2(3)**: 239-269.
- Liede-Schumann, S., H.H. Kong, U. Meve and M. Thiv.** 2012. *Vincetoxicum* and *Tylophora* (Apocynaceae: Asclepiadoideae: Asclepiadeae) - two sides of the same medal: Independent shifts from tropical to temperate habitats. Taxon **61**: 803-825.
- Liede-Schumann, S., R. Khanum, A.S. Mumtaz, I. Gherghel and A. Pahlevani.** 2016. Going west - A subtropical lineage (*Vincetoxicum*, Apocynaceae: Asclepiadoideae) expanding into Europe. Mol. Phylogenet. Evol. **94**: 436-446.
- Liede-Schumann, S. and U. Meve.** 2006. The Genera of Periplocoideae, Secamonoideae and Asclepiadoideae (Apocynaceae). Updated Synopsis in the INTKEY databases of the DELTA System. Version: June 2006. <http://www.pflanzensystematik.uni-bayreuth.de>
- Mabberley, D. J.** 2017. Mabberley's Plant-Book. Cambridge University Press, p.1102.
- Qiu, S.X., D.Z. Li, Z.X. Zhang, J. Zhou and C.Y. Wu.** 1989. Chemotaxonomy of *Cynanchum* and its allied genera with notes on the generic characteristics of *Vincetoxicum*. Acta Bot. Yunnanica **11**: 41-50.
- Omlor, R.** 1996. Notes on Marsdenieae (Asclepiadaceae): A new, unusual species of *Hoya* from Northern Borneo. Novon **6(3)**: 288-294.
- Rintz, R.E.** 1978. The Peninsular Malaysian species of *Hoya* (Asclepiadaceae). Malay. Nat. J. **30**: 467-522.
- Stuedel, E. T.** 1841. *Tylophora ovata* (Lindl.) Hook. ex Steud. Nomenclator Botanicus, ed. 2. Stuttgartiae et Tubingae. p.726.
- Yamashiro, T., T. Fukuda, J. Yokoyama and M. Maki.** 2004. Molecular phylogeny of *Vincetoxicum* (Apocynaceae-Asclepiadoideae) based on the nucleotide sequences of *cpDNA* and *nrDNA*. Mol. Phylogenet. Evol. **31(2)**: 689-700.
- Yamashiro, T. and M. Maki.** 2005. A comparative study of the reproductive character and genetic diversity of an autogamous *Tylophora matsumurae* and its progenitor *Tylophora tanakae* (Apocynaceae-Asclepiadoideae). Plant Syst. Evol. **256(1-4)**: 55-67.
- Yamashiro, T., A. Yamashiro, J. Yokoyama and M. Maki.** 2008. Morphological aspects and phylogenetic analyses of pollination systems in the *Tylophora-Vincetoxicum* complex (Apocynaceae-Asclepiadoideae) in Japan. Biol. J. Linn. Soc. Lond. **93(2)**: 325-341.
- Wanntorp, L. and P.I. Forster.** 2007. Phylogenetic relationships between *Hoya* and the monotypic genera *Madangia*, *Absolmsia*, and *Micholitzia* (Apocynaceae, Marsdenieae): insights from flower morphology. Ann. Mo. Bot. Gard. **94(1)**: 36-55.
- Wanntorp, L., A. Kocyan, R. van Donkelaar and S.S. Renner.** 2006. Towards a monophyletic *Hoya* (Marsdenieae, Apocynaceae): Inferences from the chloroplast *trnL* region and the *rbcL-atpB* spacer. Syst. Bot. **31(3)**: 586-596.
- Wanntorp, L. and H. Kunze.** 2009. Identifying synapomorphies in the flowers of *Hoya* and *Dischidia* - towards phylogenetic understanding. Int. J. Plant Sci. **170(3)**: 331-342.
- Wight, R.** 1834. Contributions to the Botany of India. Neill & Co., Old Fish market, Edinburgh. p.31.