



A new species and a synopsis of the *Hedyotis*-*Oldenlandia* group (*Rubiaceae*: *Spermacoceae*) in Andaman & Nicobar Islands, India

M.D. Nandikar¹, K.C. Kishor¹

Key words

Andaman & Nicobar Islands
Hedyotis-*Oldenlandia*
India
new species
typification

Abstract An identification key to all the reported species of *Hedyotis*-*Oldenlandia* group (*Hedyotis*, *Oldenlandia*, *Exallage*, *Leptopetalum*, *Scleromitron* and *Debia*) in Andaman & Nicobar Islands is presented with one new species, *Oldenlandia smita-crishnae*, described from Saddle Peak forests of North Andaman, India. It shares some characters with *Oldenlandia herbacea*, *O. corymbosa* and *O. pseudocorymbosa*. However, it is remarkable for its abaxially puberulous leaves, divaricate stipules, ellipsoid to obovoid hypanthium, pink-striped corolla lobes and 20–30-seeded, inserted capsule. Furthermore, a new combination in *Exallage* is proposed and lectotypes for *Spermacoce cristata*, *S. costata*, *Hedyotis vestita* and *Oldenlandia stocksii* are designated.

Published on 27 September 2019

INTRODUCTION

Hedyotis L. and *Oldenlandia* L. are two of the largest genera in the family *Rubiaceae*, with a total of about 515 species, and are distributed throughout the tropics, especially the old world (Terrell & Robinson 2003, Dutta & Deb 2004, Mabberley 2008). The genus *Hedyotis* has been in a taxonomic flux for a long time due to its variable circumscription. It has often been confused with *Oldenlandia* and has been treated with other related genera as the *Hedyotis*-*Oldenlandia* complex (Guo et al. 2013, Wikström et al. 2013, Neupane et al. 2015) in the tribe *Spermacoceae* (Bremner & Manen 2000). Traditional approaches to merge these genera, *Hedyotis*, *Houstonia*, *Kadua*, *Kohautia* and *Oldenlandia*, in a broader *Hedyotis* (Fosberg 1943, Merrill & Metcalf 1946, Lewis 1961, Rogers 1987, Wagner et al. 1989, Fosberg & Sachet 1991, Dutta & Deb 2004) are not supported by phylogenetic analysis of the tribe *Spermacoceae* in which 13 monophyletic genera are upheld (*Debia*, *Dentella*, *Dimetia*, *Edrastima*, *Exallage*, *Hedyotis*, *Involucrella*, *Kadua*, *Kohautia*, *Leptopetalum*, *Neanotis*, *Oldenlandia* and *Scleromitron*) (Neupane et al. 2015).

Hooker (1880) treated *Hedyotis* and *Oldenlandia* as distinct genera and recorded 57 and 23 species, respectively, for British India. Dutta & Deb (2004) in their revision of the genus *Hedyotis* for the Indian subcontinent included *Oldenlandia* in *Hedyotis* s.lat. and described and illustrated 74 species in 7 different sections. For Andaman & Nicobar Islands, Murugan et al. (2016) enumerated *Hedyotis* with 4 species and *Oldenlandia* with 8 species. This enumeration is expanded here by adding *Exallage paradoxa*, *Oldenlandia graminicola*, *O. pseudocorymbosa* and *O. pumila*.

The Hedyotis-*Oldenlandia* complex in Andaman & Nicobar Islands

In the present article we follow the recent generic circumscriptions in the *Hedyotis*-*Oldenlandia* complex (Neupane et al.

2015), and recognise 17 species from Andaman & Nicobar Islands in six genera: *Debia*, *Exallage*, *Hedyotis*, *Leptopetalum*, *Oldenlandia* and *Scleromitron*. The genus *Debia* Neupane & N.Wikstr. is represented by the endemic *D. andamanica* (Kurz) Neupane & N.Wikstr. (*Hedyotis andamanica* Kurz) and can be recognised in the field by its ovate leaves and ridged hypanthium. The genus *Exallage* Bremek. can be separated from the remaining species in the *Hedyotis*-*Oldenlandia* complex by its crustaceous, hard, indehiscent, globose fruits, it includes four species: an endemic *E. paradoxa* (Kurz) Bremek. (*H. paradoxa* Kurz); *E. insularis* (Spreng.) Neupane & N.Wikstr. (*Spermacoce insularis* Spreng.) known from India and Southeast Asia; *E. auricularia* (L.) Bremek. (*Hedyotis auricularia* L.) distributed throughout tropical Asia (Fukuoka 1970, Terrell & Robinson 2003, Dutta & Deb 2004) and *Exallage cristata* (Willd. ex Roem. & Schult.) Nandikar & K.C.Kishor, a new combination for *Spermacoce cristata* Willd. ex Roem. & Schult. It is distributed in Andaman & Nicobar Islands, North India, Caroline Islands, China and Southeast Asia (Fukuoka 1970, Fosberg & Sachet 1991, Dutta & Deb 2004). *Exallage costata* (Roxb.) Bremek. (1952) and *Hedyotis vestita* R.Br. ex G.Don (1834: 526, erroneously cited as 527 by Terrell & Robinson 2003, Dutta & Deb 2004) is found to be conspecific with *E. cristata*.

The genus *Hedyotis* is represented in Andaman & Nicobar Islands by a sole species *H. congesta* R.Br. ex G.Don which also occurs in Malaysia and Indonesia (Dutta & Deb 2004). The genus is characterised by having perennial herbs or shrubs and septically dehiscing capsules. The occurrence of this species listed by Fukuoka (1970) under *H. philippensis* (Wild. ex Spreng.) Merr. ex C.B.Rob. (1911) (*Spermacoce philippensis* Wild. ex Spreng.) in Thailand appears to be a mistake, as he has synonymised *H. congesta* R.Br. ex G.Don (1834) instead of *H. congesta* Merr. (1906), which is an illegitimate, later homonym. *Hedyotis congesta* has been included as synonym of *H. prostrata* Blume (www.plantsoftheworldonline.org) which needs to be verified, as the latter species is a weak decumbent herb, while the former is an erect shrub.

Leptopetalum is represented with two taxa in Andaman & Nicobar Islands and can be characterised by its ridged or winged

¹ Naoroji Godrej Centre for Plant Research (NGCPR), Lawkim Campus, Shindewadi, Post Shirwal, District Satara, Maharashtra, India - 412801; corresponding author e-mail: mnandikar@gmail.com.

hypanthium: *Leptopetalum biflorum* (L.) Neupane & N. Wikstr. (*Oldenlandia biflora* L.) and *L. pteritum* (Blume) Neupane & N. Wikstr. (*Hedyotis pterita* Blume), both distributed throughout tropical Asia (Fukuoka 1970, Dutta & Deb 2004). Likewise, the genus *Scleromitrium* (Wight & Arn.) Meisn. is also represented by two taxa, and has strictly axillary flowers and exerted stamens with distinct filaments: *Scleromitrium tenelliflorum* (Blume) Korth. (*H. tenelliflora* Blume) and *S. verticillatum* (L.) R.J. Wang (*Oldenlandia verticillata* L.) are distributed throughout tropical Asia (Fukuoka 1970, Dutta & Deb 2004), the former is also known from Australia (Halford 1992).

The genus *Oldenlandia* is represented in Andaman & Nicobar Islands with six species and can be recognised by a combination of characters: linear-lanceolate leaves, solitary to many-flowered cymes, usually inserted stamens and loculicidally dehiscent capsules. *Oldenlandia graminicola* (Kurz) Deb & M. Gangop. (*Hedyotis graminicola* Kurz) is an endemic to Andaman & Nicobar Islands; *O. pumila* (L.f.) DC. (*H. pumila* L.f.) is distributed in India, Bangladesh, Sri Lanka and Southeast Asia; *O. corymbosa* L. is common throughout tropical Africa and Asia and introduced in America and Australia; *O. diffusa* (Willd.) Roxb. (*H. diffusa* Willd.) and *O. pseudocorymbosa* (Bakh.f.) Raizada (*H. pseudocorymbosa* Bakh.f.) are known throughout India and Southeast Asia and *O. wallichii* Craib (*H. wallichii* Kurz) is distributed in India (Nicobar Islands) to Southeast Asia (Fukuoka 1970, Dutta & Deb 2004). The occurrence of *O. wallichii* (as *Hedyotis kurzii*) in mainland India (Kerala and Karnataka, Rashmi & Krishnakumar 2015) is mistaken, as one of the key characters 'capsule crowned by calyx' (Kurz 1876) is completely absent in their specimen, as we have confirmed with the help of capsule photographs in their article. In addition, no voucher specimen (Rashmi & Krishnakumar 642) appear to be housed at MH. The species diagnosis by Rashmi & Krishnakumar (2015) is more similar to the description for *H. kurzii* by Dutta & Deb (2004), except for the globose and lobed fruit which is unusual in the genus *Oldenlandia*.

The genus *Oldenlandia* keys out based on its annual habit (Neupane et al. 2015); however, some *Oldenlandia* species (*O. graminifolia*, *O. herbacea*, *O. pumila*) have a perennial woody rootstock which accordingly appears to be a too variable character to circumscribe the genus.

Saddle Peak National Park, the highest mountain peak in the Andaman Islands is known for its coastline, stunted evergreen forests with mixed patches of rocky outcrops and open scrub

habitats and harbours many endemic taxa (Reddy & Prasad 2008). In our recent botanical expedition to the Saddle Peak National Park, we have collected an *Oldenlandia* plant with pink-striped corolla lobes from an open scrub forest in rocky situations of the Saddle Peak forest of North Andaman. A careful study of the collected species and thorough scrutiny of the literature (Hooker 1880, Fukuoka 1970, Terrell & Robinson 2003, Dutta & Deb 2004, Alejandro 2007, Murugan et al. 2016) revealed several morphological differences from the known taxa of genus *Oldenlandia*. It is described here as *Oldenlandia smita-crishnae*, which has been keyed out here along with all the reported species of *Hedyotis-Oldenlandia* complex in Andaman & Nicobar Islands, for ease of identification. Furthermore, *Spermacoce cristata*, *S. costata*, *Hedyotis vestita* and *Oldenlandia stocksii* Hook.f. are lectotypified.

TAXONOMY

Oldenlandia smita-crishnae Nandikar & K.C. Kishor, *sp. nov.*
— Fig. 1, 2

Type: *M.D. Nandikar & K.C. Kishor 2118* (holo CAL; iso K, NGCPR, PBL), India, Andaman & Nicobar Islands, North Andaman, Saddle Peak National Park, N13.15°54'1" E093.01°884", elevation 513 m a.s.l., 7 Oct. 2017.

Etymology. Named after Mrs. & Mr. Crishna (Smita Godrej Crishna and Vijay Mohan Crishna), Directors of the Naoroji Godrej Centre for Plant Research in Shirwal, Satara, India, to honour their promotion of plant taxonomy and conservation.

Erect, 5–20 cm high, annual or perennial herb. *Roots* thin, fibrous, often with woody rootstock. *Stem* usually branched, terete, light green tinged with pink, glabrous. *Leaves* stipulate, stipule divaricate with two small basal projections, 1.5–2.5 by 0.1–0.3 mm, ligulate, sparsely toothed on the margin; leaf lamina sessile, linear-elliptic or lanceolate, 1–2 by 0.1–0.3 cm, apex acute, base attenuate, margin puberulent, adaxially glabrous, abaxially puberulous. *Inflorescence* axillary, solitary or a 2-flowered cyme. *Flower* pedicellate, pedicel 1–2 cm long, glabrous, filiform; flower homostylous, 6–7.5 mm long; hypanthium obovoid, 1–3 by 0.5–1.5 mm; calyx lobes 4, lanceolate, base obtuse, green with pink tinge, margin with small setae, pink, midrib prominent; corolla infundibuliform, 4–5 mm long; tube slender, 1–2 mm long, white, glabrous without and sparsely to densely puberulous within (at throat); lobes 4, elliptic-lanceolate, 2–2.5 by 0.3–1 mm, apex acuminate, white with pink aciculated, gla-

Table 1 Morphological comparison between *Hedyotis smita-crishnae* and similar species.

Characters	<i>H. smita-crishnae</i>	<i>H. herbacea</i>	<i>H. corymbosa</i>	<i>H. pseudocorymbosa</i>
Habit	Annual or perennial herb	Annual or perennial herb	Annual herb	Annual herb
Stem shape	Terete	Acutely angular or 4-ribbed	Acutely angular or cylindrical	Terete
Leaf margin	Puberulent to scabrid	Glabrous	Glabrous or pubescent	Scabrid
abaxial surface	Puberulous	Glabrous	Glabrous	Scabrid on midrib
stipule	Divaricate with two small basal projection	Truncate with few setae on the margin	Fimbriate with 2–4 lobes	Pectinate with few teeth
Inflorescence	Usually solitary, rarely 2-flowered axillary cyme	Solitary or in paired cyme	2–5-flowered corymbose, umbels or racemose cymes	2–5-flowered axillary cyme
Flower length	10–20 mm	6–22(–30) mm	1–10 mm	2.5–14 mm
hypanthium	Obovoid	Ovoid	Ellipsoid or ovoid	Globose
	1–3 mm	0.8–1 mm	0.7–1 mm	0.7–1 mm
calyx lobes	Lanceolate	Triangular	Narrowly triangular	Narrowly triangular
corolla	White with double-lined pink stripe	White or white with purple spots	White	White or white with red tinge above
tube	Puberulous at the throat inside	Glabrous inside	Ring of pubescent hairs in mouth of the tube	Glabrous inside
lobes	Elliptic-lanceolate	Ovate	Ovate	Ovate
Stamen anther	Linear to oblong	Linear	Subglobose	Globose
filament	Inconspicuous	0.1–0.2 mm	0.2–0.8 mm	0.1–0.2 mm
Capsule	Globose-obovoid, apex not protrude beyond calyx segment	Ovoid or subglobose, apex protrude beyond calyx segment	Globose, apex slightly protrude beyond calyx	Globose, apex slightly protrude beyond calyx segments

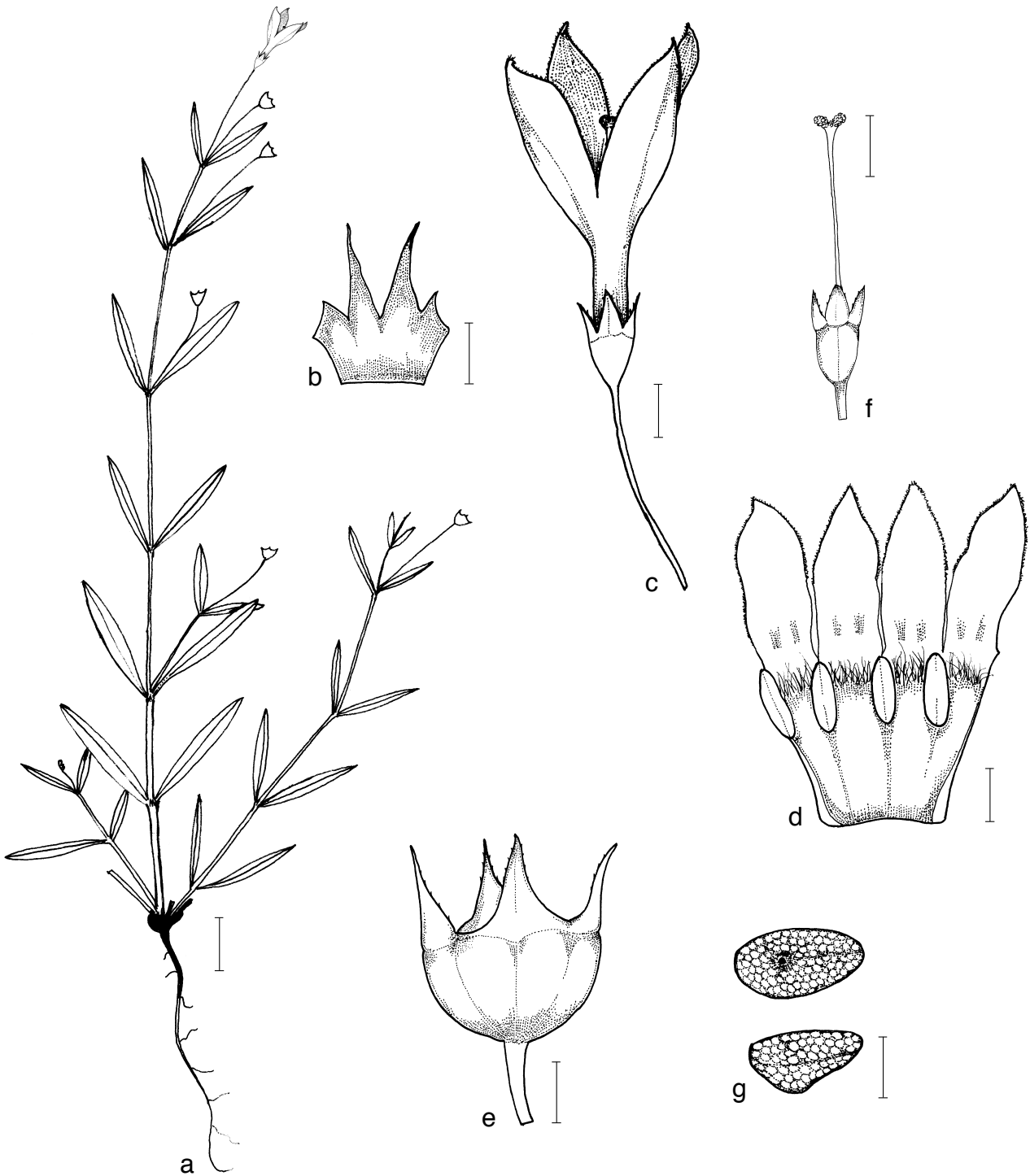


Fig. 1 *Hedyotis smita-crishnae* Nandikar & K.C.Kishor. a. Habit; b. stipule; c. flower; d. opened corolla with adnate stamens; e. capsule; f. pistil with hypanthium; g. seeds (ventral and lateral view) (all M.D. Nandikar & K.C. Kishor 2118, CAL). — Scale bars: a–b, e = 1 mm; c = 1.2 mm; d = 0.6 mm; f = 0.7 mm; g = 0.8 mm. — Drawn by Mayur D. Nandikar.

brous without and double lined pink-striped, sparsely puberulent within (densely at margin). *Stamens* 4, included, filament inconspicuous; anther linear to oblong, 0.8–1 mm long, erect, equal, bilobed, adnate to corolla tube, dorsifixed; pollen periporous, 100–130 by 90–100 μ m, prolate-spheroidal to subprolate in shape. *Ovary* globose or ovoid, 1.5–2 mm across, glabrous; style slender, 3–4 mm long, glabrous; stigma bilobed, exceeding corolla tube. *Capsule* globose or ovoid, 2–2.5 by 1–1.5 mm, bilocular, crowned by persistent protruding calyx lobes. *Seeds* 20–30 per capsule, outline deltoid, 0.3–0.4 by 0.1–0.2 mm, ventrally ellipsoid, dorsally obovoid, testa reticulate-foveate, shiny, dark greyish brown, hilum punctiform.

Phenology — Flowering and fruiting throughout the year, but peak during October.

Distribution & Ecology — An endemic to the Saddle Peak National Park, North Andaman, Andaman & Nicobar Islands, India. It grows abundantly in an open scrub forest of the Saddle Peak forest of North Andaman, mainly preferring open rocky situations of the mountain peak at an elevation of 500–540 m a.s.l. The associated plant species include *Crotalaria uncinella* Lam. subsp. *elliptica* (Roxb.) Polhill, *Dioscorea belophylla* (Prain) Voigt ex Haines, *Grewia indandamanica* J.L.Ellis & L.N.Ray, *Memecylon umbellatum* Burm.f., *Murdannia saddlepeakensis* M.V.Ramana & Nandikar and *Sonerila andamanensis* Stapf & King.



Fig. 2 *Hedyotis smita-crishnae* Nandikar & K.C.Kishor. a. Habitat from Saddle Peak National Park; b. habit; c. upper view of flower; d. lateral view of flower. — Photos by Mayur D. Nandikar.

Conservation status — An estimation of area of occurrence (AOO) of the species is unworkable, as some of the forest patches of the Saddle Peak National Park are inaccessible. Therefore, it is here assessed as Data Deficient (DD), using the criteria of IUCN (2017). The first collection of *Oldenlandia smita-crishnae* was in 2001 (*Sumathi 17367*, PBL) labelled as ‘abundantly distributed’, we also found the species growing abundantly and one of the commonest herbaceous elements in open, rocky situations of the hilltop, and apparently not under threat.

Additional material examined (paratypes). INDIA, Andaman & Nicobar Islands, North Andaman, Saddle Peak, *R. Sumathi 17367* (PBL000010026, PBL0000010027), 18 Apr. 2001.

Notes — *Oldenlandia smita-crishnae* is similar to *O. corymbosa*, *O. pseudocorymbosa* and *O. herbacea* in a combination of characters like erect or prostrate habit, sessile to subsessile leaves and globose to ovoid ovary. However, the new species can be easily distinguished by the abaxially puberulous leaf, divaricate stipules, obovoid hypanthium, pink-striped corolla lobes, puberulous tube, inserted and 20–30 seeded capsules. A detailed comparison of *O. smita-crishnae* with *O. herbacea*, *O. corymbosa* and *O. pseudocorymbosa* is given in Table 1.

Oldenlandia smita-crishnae is also similar to *O. affinis* and *O. graminicola* in flower size and shape but the latter two differ by having terminal dichasial cymes and lax panicles. Moreover, *O. graminicola* has an angular stem, truncate stipules and scabrid pedicels, while *O. smita-crishnae* has terete stems, divaricate stipules and glabrous pedicels.

Oldenlandia homeriana Miq. (*non* Kuntze), an endemic species of Sumatra also shares similarities with *O. smita-crishnae* in being an annual with erect habit, linear leaves and infundibuliform corolla, but mainly differs in having angular stem, and distinctly exerted anthers.

NEW COMBINATION & TYPIIFICATION OF THE NAME

Exallage cristata (Willd. ex Roem. & Schult.) Nandikar & K.C.Kishor, *comb. nov.*

Spermacoce cristata Willd. ex Roem. & Schult. Syst. Veg., ed. 15(3) (1818) 530. — Type: *Roxburgh s.n.* (lectotype, perhaps holotype: B (barcode B -W 02619 -01 0, <http://herbarium.bgbm.org/object/BW02619010>), here designated), India, in Willdenow Herb., s.dat.

Spermacoce costata Roxb. (1814) 10, nom. nud.; (1820) 376. — *Hedyotis costata* (Roxb.) Kurz (1876) 135, nom. illeg.; *non* R.Br. ex G.Don (1834). — *Exallage costata* (Roxb.) Bremek. (1952) 142. — Type: *Roxburgh s.n.* (lectotype BR (barcode BR0000005316632), here designated), s.loc., s.dat. *Hedyotis vestita* R.Br. ex G.Don (1834) 526. — Type: *R. Brown s.n.* (lectotype BM (barcode BM000833378, <http://data.nhm.ac.uk/object/d9335565-6865-4070-aa48-9286cef8ac85>), here designated), 1822; isolectotypes BM (BM001217239), CAL (CAL0000069601; CAL0000069602), K (K000770018; K001110053), Malaysia, P. Penang.

Notes — A specimen has been traced at B, Willdenow Herbarium (B -W 02619 -01 0) annotated by Willdenow as *S. cristata*, originally collected by Roxburgh as *S. costata*; it is chosen here as lectotype. Another specimen collected by Roxburgh is at BR (BR0000005316632) with an annotation by Roxburgh as ‘*S. costata* duplicate’. It is not certain that this is a duplicate of the lectotype specimen, and it bears no annotation by Willdenow. It is here selected as lectotype of *S. costata*, which is then a heterotypic synonym of *S. cristata*.

The name *Hedyotis vestita* is based on Robert Brown’s collections from Penang and Sylhet. It appeared first in Wallich’s Catalogue and was later validated by Don (1834). We could find multiple specimens from both Penang and Sylhet labelled no. 847 (1/A and 2/B) at BM, CAL and K. One of the specimens from Penang (Wall. Cat. no. 847.1/A barcode BM000833378)

is here selected as lectotype, duplicates at CAL and K are isolectotypes.

***Oldenlandia stocksii* Hook.f.**

Oldenlandia stocksii Hook.f. (1880) 67. — Type: *Stocks s.n.* (lectotype K (barcode K000031278, <http://specimens.kew.org/herbarium/K000031278>), here designated), s.dat.; isolectotypes A (A01154646), BR (BR0000005587308, BR0000005587629), CAL (CAL0000010806, CAL0000010809), F (F0069816F), GH (GH00097088), K (K000031279), L (L.2917167, L.2917168), M (M0198369, M0198370), MPU (MPU021357), P (P03984807, P03984808, P05459154), S (S14-14477, S14-14484), India, Karnataka, Chikkamagaluru District, Bababooden hills (Baba Budan hills), s.dat.

Note — Hooker in 1880 described *Oldenlandia stocksii* in Flora of British India on basis of the collection made by Stocks & Law from ‘Malabar, in the Bababooden hills (Baba Budan hills)’ with no further information provided. Various collections made by Stocks from Malabar (1847–1851) are incorporated in Herbarium Indiae Orientalis by Hooker & Thomson (Staffeu & Cowan 1986). During the present investigation we also traced collections at P (3 sheets), BR, CAL, K, L, M and S (2 sheets in each) and single sheets at A, F, GH, H and MPU. All sheets are in agreement with the protologue and can be regarded as syntypes. As the primary repository of Hooker is at K, we selected the specimen barcode number K000031278 as lectotype, the remaining specimens are isolectotypes.

KEY TO THE HEDYOTIS-OLDENLANDIA GROUP IN ANDAMAN & NICOBAR ISLANDS

- 1. Perennial herbs or shrubs; inflorescence an axillary head or umbel; flowers usually subsessile, crowded 2
- 1. Annual herbs; inflorescence terminal, terminal and axillary, an axillary cyme, corymbose or capitate; flowers distinctly pedicellate 6
- 2. Capsule hemispherical, dehiscent septically *Hedyotis congesta*
- 2. Capsule globose, crustaceous or hard, indehiscent 3
- 3. Villous or puberulous herbs; leaves ovate-lanceolate or elliptic-lanceolate 4
- 3. Sparsely pubescent to glabrous herbs or shrubs; leaves linear-lanceolate 5
- 4. Stipule with 2–7, puberulous projections, leaf base cuneate, apex acute *Exallage auricularia*
- 4. Stipule with 1–3, villous projections, leaf base attenuate, apex acuminate *Exallage cristata*
- 5. Stipules with 3 linear, unequal projections; apex of corolla lobes glabrous; stigma clavate *Exallage insularis*
- 5. Stipules with 6–10 filiform, unequal projections; apex of corolla lobes sparsely tomentellous; stigma bilobed *Exallage paradoxa*
- 6. Leaves ovate, elliptic or obovate; hypanthium distinctly ridged; calyx teeth usually recurved *Debia andamanica*
- 6. Leaves usually linear-lanceolate, linear, elliptic-lanceolate or obovate; hypanthium smooth; calyx teeth porrect 7
- 7. Stem terete 8
- 7. Stem angular 10
- 8. Flowers 2–5 mm long, hypanthium globose, corolla tubular, lobes pink-white or white with red tinge, mouth of the corolla tube glabrous within 9
- 8. Flowers 6–7.5 mm long, hypanthium obovoid, corolla infundibuliform, lobes white with double-lined pink stripe, mouth of the corolla tube puberulous within *Oldenlandia smita-crishnae*

9. Stem scabrid; flowers 2–3 mm long, calyx lobe narrowly triangular *Oldenlandia pseudocorymbosa*
9. Stem glabrous; flowers 4–5 mm long, calyx lobe ovate-lanceolate *Oldenlandia diffusa*
10. Inflorescence strictly axillary; flowers homostylous; stamens exerted, filaments distinct 11
10. Inflorescence axillary and terminal; flowers heterostylous; stamens inserted, filaments inconspicuous 12
11. Stipule deltate; inflorescence 2–4-flowered; filaments 2–2.5 mm long; stigma bifid; capsule glabrous *Scleromitrium tenelliflorum*
11. Stipule cupular; inflorescence with clusters of 4–10(–16)-flowers; filaments 4–4.6 mm long; stigma bilobed; capsule hispid *Scleromitrium verticillatum*
12. Hypanthium ridged or winged 13
12. Hypanthium smooth 14
13. Decumbent, sparsely branched herbs; cymes 2-flowered, stamens inserted in the sinus of corolla lobes *Leptopetalum biflorum*
13. Erecto-patent, diffusely branched herbs; cymes 3–8-flowered; stamens adnate to corolla tube *Leptopetalum pteritum*
14. Stem glabrous or pilose; flowers in umbels, corymbs or many-flowered branched cymes 15
14. Stem scabrous; flowers solitary or in 2-flowered cymes 16
15. Stamens inserted at the sinus of corolla lobes; stigma bifid *Oldenlandia wallichii*
15. Stamens adnate to the corolla tube; stigma bilobed *Oldenlandia corymbosa*
16. Leaves elliptic or elliptic-lanceolate; flowers 2.5–3 mm long; stigma with tufted hairs *Oldenlandia pumila*
16. Leaves linear-lanceolate; flowers 7–8 mm long; stigma glabrous *Oldenlandia graminicola*

Acknowledgements The authors are grateful to Mr. & Mrs. Crishna, Directors NGCPR, for their constant support and providing research facilities, Dr. Nilesh V Malpure, S.S.G.M. College, Kopergaon, Ahmednagar for his assistance during field collection, Smt. Arti Chaudhary, Conservator of Forest (WL), Andaman & Nicobar Islands for endorsing forest permission and Drs. Lal Ji Singh and Vivek, Botanical Survey of India (PBL), Andaman & Nicobar Regional Centre, for their substantial help in consultation of herbarium and library. We are also thankful to the authorities of A, B, BR, CAL, F, H, K, L, M, MH, MPU, P and S herbaria for making images/data available online and their responses over e-mail.

REFERENCES

- Alejandro GJD. 2007. The current status of the Philippine Rubiaceae. *Philippine Journal of Systematic Biology* 1(1): 47–60.
- Bremekamp CEB. 1952. The African species of *Oldenlandia* L. sensu Hiern et K. Schumann. *Verhandelingen der Koninklijke Nederlandsche Akademie van Wetenschappen. Afdeling Natuurkunde* 48(2): 142.
- Bremer B, Manen JF. 2000. Phylogeny and classification of the subfamily Rubioideae (Rubiaceae). *Plant Systematics and Evolution* 225: 43–72.
- Don G. 1834. A general history of the Dichlamydeous plants. J.G. and F. Rivington, London.
- Dutta R, Deb DB. 2004. Taxonomic revision of *Hedyotis* L. (Rubiaceae) in Indian subcontinent. *Botanical Survey of India, Kolkata*.
- Fosberg FR. 1943. The Polynesian species of *Hedyotis* (Rubiaceae). *Bulletin of the Bernice P. Bishop Museum* 174: 1–102.
- Fosberg FR, Sachet MH. 1991. Studies in Indo-Pacific Rubiaceae. *Allertonia* 6: 191–278.
- Fukuoka N. 1970. Contributions to the Flora of Southeast Asia III: *Hedyotis* (Rubiaceae) of Thailand. *South East Asia Studies* 8(3): 305–336.
- Guo X, Wang RJ, Simmons MP, et al. 2013. Phylogeny of the Asian *Hedyotis*-*Oldenlandia* complex (Spermacoceae, Rubiaceae): Evidences for high levels of polyphyly and the parallel evolution of diplophragmous capsules. *Molecular Phylogenetics and Evolution* 67(1): 110–122.
- Halford DA. 1992. Review of the genus *Oldenlandia* L. (Rubiaceae) and related genera in Australia. *Austrobaileya* 3(4): 683–722.
- Hooker JD. 1880. *Flora of British India*. Vol III (VII). Reeve & Co., London.
- IUCN. 2017. Guidelines for using the IUCN red list categories and criteria. Version 13. Gland: IUCN.
- Kurz WS. 1876. A sketch of the vegetation of the Nicobar Islands. *Journal of the Asiatic Society of Bengal* 2(3): 135–136.
- Lewis WH. 1961. Merger of the North American *Houstonia* and *Oldenlandia* under *Hedyotis*. *Rhodora* 63: 216–223.
- Mabberley DJ. 2008. *Mabberley's plant-book: a portable dictionary of plants, their classifications and uses* (ed. 3). Cambridge University Press.
- Merrill ED. 1906. The Flora of the Lamao forest reserve. *The Philippine Journal of Science* 1(1): 127.
- Merrill ED, Metcalf C. 1946. *Hedyotis* L. versus *Oldenlandia* L. and the status of *Hedyotis lancea* Thunb. in relation to *H. consanguinea* Hance. *Journal of the Arnold Arboretum* 23: 226–230.
- Murugan C, Prabhu S, Sathiyaseelan R, et al. 2016. A checklist of plants of Andaman & Nicobar Islands. www.bsiennis.nic.in/Database/Checklist-of-Andaman-Nicobar-Islands_24427.aspx www.bsiennis.nic.in/Database/Checklist-of-Andaman-Nicobar-Islands_24427.aspx. Last accessed 5 Oct. 2018.
- Neupane S, Dessein S, Wikström N, et al. 2015. The *Hedyotis*-*Oldenlandia* complex (Rubiaceae: Spermacoceae) in Asia and the Pacific: Phylogeny revisited with new generic delimitations. *Taxon* 64(2): 299–322.
- Rashmi K, Krishnakumar G. 2015. *Hedyotis kurzii* (Rubiaceae): A new record for Peninsular India. *Rheedea* 25(2): 146–147.
- Reddy CS, Prasad CRD. 2008. Tree flora of Saddle Peak National Park, Andaman, India. *Journal of Plant Science* 3(1): 1–17.
- Robinson CB. 1911. Botanical notes upon the islands of Polillo. *The Philippine Journal of Science* 6(3): 222.
- Rogers GK. 1987. The genera of Cinchonoideae (Rubiaceae) in the southern United States. *Journal of the Arnold Arboretum* 68: 137–183.
- Roxburgh W. 1814. *Hortus Bengalensis: or, A catalogue of the plants growing in the Botanical Garden at Calcutta*. Serampore.
- Roxburgh W. 1820. *Flora Indica; or Descriptions of Indian plants*, Vol. I. Serampore.
- Stafleu FA, Cowan RS. 1986. *Taxonomic literature*, second edition, Vol. 6. Sti–Vuy. Scheltema & Holkema, Utrecht.
- Terrell EE, Robinson H. 2003. Survey of Asian and Pacific species of *Hedyotis* and *Exallage* (Rubiaceae) with nomenclatural notes on *Hedyotis* types. *Taxon* 52(4): 775–782.
- Wagner WL, Herbst DR, Sohmer SH. 1989. Contributions to the flora of Hawaii. II. Begoniaceae-Violaceae and the Monocotyledons. *Bernice P. Bishop Museum Occasional Papers* 29: 88–130.
- Wikström N, Neupane S, Kårehed J, et al. 2013. Phylogeny of *Hedyotis* L. (Rubiaceae: Spermacoceae): Redefining a complex Asian-Pacific assemblage. *Taxon* 62(2): 357–374.