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Contributions to the Flora of Southeast Asia

III. *Hedyotis* (Rubiaceae) of Thailand

by

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Our knowledge of the genus *Hedyotis* still remains obscure. Its circumscription varies with each author. J. D. HOOKER[1], CRAIB[2] and others recognize both *Oldenlandia* and *Hedyotis* as genera, but SCHUMANN[3], PITARD[4], and others united them into a single genus. MERRILL & METCALF[5] followed the latter course and recognized only *Hedyotis*, after careful comparison of the species of *Hedyotis* and *Oldenlandia* originally described by LINNAEUS[6]. J. D. HOOKER appropriately recognized that *Anotis* and *Oldenlandia* are too difficult to define as distinct genera.

Infrageneric classification in *Hedyotis* sensu lat. is not settled. Some sections were described by J. D. HOOKER and followed by SCHUMANN. Twelve sections have thus been recognized, chiefly based on differences in the capsules and corollas.

More than 300 species have been described in *Hedyotis* sensu lat. mainly occurring in the subtropical areas of Asia. PITARD reported 71 species of *Hedyotis* (as *Oldenlandia*) from Indo-China, including Thailand, to which 14 species were credited. CRAIB listed up 46 species of *Hedyotis* and 17 species and 2 varieties of *Oldenlandia* for the flora of Thailand. His enumeration contains many endemic species described by CRAIB himself and GEDDES. Since then the Thai species of *Hedyotis* have not been re-examined.

Recently, I have made two botanical trips to Thailand and Malaya, where I could have observed in detail the wild plants of this genus and have gathered many dried specimens. In addition, I have studied many type specimens in KERR's collection in the herbarium of the Department of Agriculture, at Bangkok.

The purpose of this paper is to revise the Thai species of *Hedyotis*. Some Indochinese species of *Oldenlandia* described by PITARD are transferred to *Hedyotis*. Some species

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1) J. D. HOOKER, in his Flora of British India **3**:49–71, 1880, suggested that there were intermediate forms between *Hedyotis* and *Oldenlandia*, such as *O. wightii* and *Hedyotis* Sect. *Scleromitrion*.
2) Florae Siamensis Enumeratio **2**:36–59, 1932.
3) In Engler & Prantle, Pflanzenfamilien **4** (4):24–26, 1891.
4) In LECOMTE, Flore Générale de l'Indo-Chine **3**:92–155, 1922.
5) In Jour. Arn. Arb. **23**:226–230, 1942.
6) Species Plantarum. **2**, 1753.

described by CRAIB and GEDDES are either reduced to varietal rank or are found synonymous with other species which occur in neighbouring countries. Thirteen species from the CRAIB's Enumeratio are excluded from this paper, because we have as yet insufficient materials for detailed study.

For this study, I have examined the specimens preserved in the Herbaria of Kyoto University (KYO), of the University of Tokyo (TI), of Royal Forest Department at Bangkok (BKF), of Department of Agriculture at Bangkok (BK), and of the Botanic Garden, Singapore (SING). I wish here to express my gratitude to the directors and the curators of those herbaria. Mr. E. YOKOTA, former president of Shoei Junior College, generously supported my work; Professors S. KITAMURA and M. TAGAWA, both of Kyoto University, made many valuable suggestions during my studies; Dr. E. H. WALKER, Smithsonian Institution, was so kind as to edit the present article, as in the case of the other papers of this series.

Key to the species

1A. Herb or erect or decumbent shrub, not climbing.....2.
2A. Cymes terminal or terminal and axillary.....3.
3A. Cymes with capitate flowers and pedicels scarcely or shortly developed.....
.....4.
4A. Cymes all terminal.....5.
5A. Capitate flowers with long peduncles, 3–7.5 cm long; capsule 2.5 mm long with subulate calyx-lobes 2.5 mm long; leaves opposite, lanceolate-oblong, herbaceous, glabrous on the lower surface.....29. *H. oligocephala.*
5B. Capitate flowers scarcely peduncled, the pedicels none or short; leaves at the uppermost node verticillate or opposite.....6.
6A. Small sub-shrubs or herbs, less than 30 cm tall; capsule with larger and straight calyx-lobes 5 mm long, 1–2 mm wide; leaves glabrous on the lower surface; stipules comb-shaped, the lobes spiny, 5–10, 4–13 mm long..... 19. *H. coronaria.*
6B. Shrubs, more than 30 cm tall; capsules with smaller calyx-lobes 1 mm long, and 0.2–0.3 mm wide, ending in a recurved apex; leaves scabrous on the lower surface; stipules long-deltoid, the lobes not spiny, 1–10, less than 0.5 mm long.....18. *H. scabra.*
4B. Cymes terminal and axillary.....7.
7A. Leaves linear, less than 2 mm wide, revolute on margin, rather stiff; capsules hirsute.....22. *H. pinifolia.*
7B. Leaves broader, more than 3 mm wide; capsules glabrous, puberulous or pilose.....8.
8A. Capsules more than 3 mm in diameter, glabrous or densely pilose; leaves ovate; decumbent herb.....28. *H. lindleyana.*

8B. Capsules less than 3 mm in diameter; leaves broadly linear, lanceolate, oblong-lanceolate or ovate.....9.

9A. Leaves linear-lanceolate to broadly linear, less than 4.5 cm long and less than 1 cm wide.....10. *H. rosmarinifolia.*

9B. Leaves lanceolate to oblong-lanceolate, more than 5 cm long and more than 1 cm wide .....10.

10A. Uppermost leaves reduced in size, bract-like, less than 10 mm wide; veins on the lower surface variable, not or variously raised... .....11. *H. uncinella.*

10B. Uppermost leaves not reduced, more than 1.5 cm wide, veins on the lower surface hardly prominent.....12. *H. nodiflora.*

3B. Cymes without capitate flowers, or rarely appearing capitate, with a solitary terminal flower.....11.

11A. Capsules with wings; axillary cymes shorter than the leaf and less than 4-flowered; erect or decumbent herb.....37. *H. pterita.*

11B. Capsule wingless.....12.

12A. Uppermost leaves verticillate or rarely opposite, ovate, oblong or rarely lanceolate; cymes usually longer than stem, produced only on the uppermost node of stem and branches.....41. *H. ovatifolia.*

12B. Leaves never verticillate, usually shorter than stem, if not so, leaves linear to linear-oblong.....13.

13A. Capsule long, about 4 mm, densely hairy; cyme glomerule-like with capitate flowers; leaves 7–12 cm long, 1–2.5 cm wide..... .....16. *H. corymbiformis.*

13B. Capsule short, less than 3 mm long.....14.

14A. Corolla more than 7 mm long; cymes terminal, distinctly peduncled; leaves 7–14 cm long and 3–4.5 cm wide, lateral veins 6–7 in pairs..... .....17. *H. diversifolia.*

14B. Corolla less than 5 mm long; cyme terminal and axil, peduncle obscure.....15.

15A. Ovary densely hirsute; herb erect.....16.

16A. Herb much branching, more than 10 cm in diameter; leaf herbaceous, more or less densely hirsute on the upper surface, usually distinctly rolled to the lower surface, lateral veins prominent and sparsely hirsute on the lower surface..... .....31. *H. pahompokae.*

16B. Herb slightly branching, less than 10 cm in diameter; leaf thin herbaceous, sparsely hirsute on the upper surface, usually not rolled at the margin, lateral veins not or slightly prominent

on the lower surface.....30. *H. nalampooni.*

15B. Ovary not or sparsely hairy; herb or subshrub.....17.

17A. Leaves more than 8 mm wide.....18.

18A. Capsules gradually narrowing downwards, broadest at the top; cymes diverse and slender; stipule with long acuminate apex; leaves herbaceous, lanceolate or rarely ovate-lanceolate, less than 2.5 mm wide.....35. *H. chereevensis.*

18B. Capsules not broadest at the top.....19.

19A. Calyx-lobes on the matured capsule erect, acute at the apex, more than 1 mm long; leaves 0.8–2.8 cm wide and 2.5–10 cm long.....13. *H. decora.*

19B. Calyx-lobes recurved or revolved, obtuse at the apex, less than 1 mm long; leaves 0.8–4 cm wide and 3.5–15 cm long.....14. *H. elegans.*

17B. Leaves less than 8 mm wide.....20.

20A. Leaves distinctly rolled in at the margin, thus becoming narrower, less than 1 mm wide ; capsules almost 3 mm long ; a single axillary cyme 1-flowered, or rarely a few, pedicels slender, 1–3 cm long; corollas about 5 mm long, lobes recurved or rolled in.....21.

21A. Calyx-lobes shorter, less than 1 mm long during flowering.....36. *H. graclipes.*

21B. Calyx-lobes longer, more than 1.5 mm long during flowering.....36a. *H. gracilipes* var. *longcalyx.*

20B. Leaves hardly rolled in, more than 2 mm wide.....22.

22A. Calyx-lobes on matured capsule subulate and longer, more than 1 mm long; herb erect, glabrous or hairy .....15. *H. tetrangularis.*

22B. Calyx-lobes minute, less than 1 mm long.....23.

23A. Terminal cymes shorter, usually less than 3 cm long; leaves 2–10 mm wide and 7–27 mm long; herb up to 12 cm tall.....38. *H. biflora.*

23B. Terminal cymes longer, more than 3 cm long.....24.

24A. Capsules gradually narrowing towards base; cymes slender; leaves narrowly lanceolate..... .....34. *H. dichotoma.*

24B. Capsules not so.....25.

25A. Corollas more than 3 mm long; main axil on the stem ending in cyme and axillary branches further extending, about 1/3 of the whole length of herb,

usually creeping.....33. *H. viarum.*

25B. Corollas less than 2.5 mm long; main axil ending in cyme, but axillary branches not so extending, less than 1/5 of the whole length of herb; herb erect or dwarf.....32. *H. wallichii*

2B. Cymes axillary; apical node on stem and branches without flowers.....26.

26A. Capsules thin herbaceous, easily broken; leaves linear to linear-lanceolate, herbaceous, 0.5–6 cm long and 0.2–0.5 cm wide; herb.....27.

27A. Capsules smaller, less than 2 mm wide and long; cymes with peduncle, branched and 1–8-flowered.....40. *H. corymbosa.*

27B. Capsules larger, more than 2 mm wide and long; cymes with or without pedicel, 1-flowered or rarely further branched, hence with many flowers .....28.

28A. Cymes shorter than leaf; length of corolla less than 2 times of that of ovary.....39. *H. diffusa.*

28B. Cymes longer than or as long as leaf; length of corolla more than 3 times of that of ovary; leaves linear .....29.

29A. Corollas tubular, tube scarecely widening upwards, less than 1 mm in diameter; anthers inserted.....42. *H. herbacea.*

29B. Corollas campanular, gradually widening upwards, more than 1 mm in diameter; anthers slightly exserted.....43. *H. horneriana.*

26B. Capsules herbaceous to coriaceous, not so easily broken; herb or subshrub .....30.

30A. Stipules deltoid in outline and long acuminate at the apex, linear lobes not spiny; leaves fragile and lanceolate; capsules oblong, glabrous, 2.5–4 mm long with ovate and ciliate calyx-lobes; stem distinctly quadrangular with narrow wings.....8. *H. philippensis.*

30B. Stipules comb-shaped, with spiny lobes; leaves not fragile.....31.

31A. Capsules ovoid, more than 2 mm, or rarely 1.5 mm long; calyx-lobes erect and long deltoid; leaves linear to lanceolate.....32.

32A. Capsules hispid; leaves linear-lanceolate to lanceolate, 0.5–1.5 cm wide; stem hispid; herb decumbent and more or less nigrescent in dried condition.....21. *H. verticillata.*

32B. Capsules glabrous; stem almost glabrous or hispid; herb decumbent or erect.....33.

33A. Herb decumbent; cymes scarcely peduncled; leaves rolled in, linear, less than 0.3 cm wide and 4 cm long.....20. *H. tenelliflora.*

33B. Herb erect; cymes peduncled or not; leaves linear to linear-lanceolate, becoming smaller upwards, largest one 4–9 cm long

and 0.3–2 cm wide.....20a. *H. tenelliflora* var. *kerrii.*

31B. Capsules globose, ellipsoidal, tubinate or lenticular.....34.

34A. Cymes scarcely peduncled.....35.

35A. Petioles 1.5–2 cm long, leaf-blades ovate-oblong to oblong, slightly cordate, rotundate or obtuse at the base; capsules lenticular, dehiscent, 2–2.5 mm long, calyx-lobes densely with hairs and deciduous; cymes 1–1.7 cm long and 2–2.5 cm wide; herb fleshy; stem quadrangular with narrow wings.....7. *H. tetrandra.*

35B. Petioles less than 1 cm long, gradually tapering to the base; stem more or less rounded and without wing.....36.

36A. Stem and veins on the lower surface of leaves glabrous; leaves lanceolate, 8–18 cm long and 1.5–5 cm wide; lateral veins 5–10 in pairs and distinctly raised on the lower surface...6. *H. pachycarpa.*

36B. Stem and veins on the lower surface of leaf covered with hairs; leaves lanceolate to linear-lanceolate; lateral veins less than 7 in pairs.....37.

37A. Stipules less than 4 mm wide, lobes less than 8; leaves 1.5–8 cm long and 0.2-2.5 cm wide, lateral veins distinctly raised.....1. *H. auricularia.*

37B. Stipules more than 5 mm wide, lobes more than 10; leaves 8–10 cm long and 2.3–3 cm wide; lateral veins hardly raised on the lower surface.....5. *H. hirta.*

34B. Cymes peduncled and distinctly branched.....38.

38A. Stipules without lobe; capsules less than 0.6 mm long excluding calyx-lobes; cymes up to 8 mm long and 5 mm wide, with short peduncle 1–2 mm long; stem and the upper surface of leaf glabrous .....9. *H. subcarnosa.*

38B. Stipules with spiny lobes; capsules more than 0.8 mm long.....39.

39A. Stem, leaves and capsules glabrous; cymes 1–3.5 cm long and 0.8–2 cm wide; leaves 5–12 cm long and 1–3.5 cm wide.....3. *H. glabra.*

39B. Capsules scabrous; stems and leaves scabrous, with pilose hairs or rarely glabrous.....40.

40A. Capsules scabrous; stem with two rows of yellow hairs, or glabrous; leaves herbaceous, with yellow hairs, scabrous or glabrous, lateral veins 2–3 in pairs; cymes 1–5 cm long, 1–4 cm wide.....4. *H. fulva.*

40B. Capsules with pilose hairs; stem densely hairy with yellow or dark yellow hairs; leaves thin herbaceous, densely hairy on both

the surfaces, lateral veins 4–6 in pairs; cymes 0.5–2.3 cm long, and 2.5 cm wide.....2. *H. vestita.*

1B. Climbing shrubs; cymes with capitate flowers or short-stalked.....41.

41A. Corollas scarcely exserted from calyx-lobes; flowers sessile and plants hairy.....25. *H. prainiana*

41B. Corollas distinctly exserted from calyx-lobes.....42.

42A. Capitate flowers with less flowers, less than 8 mm in diameter; flowers smaller, less than 2 mm long; calyx-lobes not recurved; pedicels short-stalked; stem and peduncle covered with brown or yellow hairs.....23. *H. similis.*

42B. Capitate flowers with many flowers, more than 8 mm in diameter; flowers larger, more than 3 mm long.....43.

43A. Calyx-lobes straight.....44.

44A. Stem, peduncle, lower surface of leaves and ovary glabrous; flowers sessile.....27. *H. capitellata.*

44B. Peduncle and main axil of inflorescence densely hairy with soft and yellow hairs ; flowers sessile or stalked.....45.

45A. Ovaries glabrous; flowers stalked.....27a. *H. capitellata* var. *pedicellata.*

45B. Ovaries hairy; flowers sessile or stalked.....27b. *H. capitellata* var. *pubescens.*

43B. Calyx-lobes recurved.....46.

46A. Flowers sessile; peduncles and stems almost glabrous...24. *H. ridleyana.*

46B. Flowers stalked; peduncles, stems and lower surface of leaves densely hairy with yellow or brown hairs.....47.

47A. Ovaries, cymes, stems and lower surface of leaf densely minute hairy.....26. *H. hedyotidea.*

47B. Ovaries glabrous, or densely or sparsely hairy with pilose hairs.....48.

48A. Ovaries, cymes, stems and both the surfaces of leaf densely pilose hairy.....26a. *H. hedyotidea* var. *obliquinervis.*

48B. Ovaries glabrous or sparsely minute hairy; stems and both the surfaces of leaves densely pilose hairy.....26b. *H. hedyotidea* var. *pitardiana.*

1. Hedyotis auricularia L., Sp. Pl. 101, 1753; Hook. f., Fl. Brit. Ind. ***3***:58, 1880; King & Gamble in Jour. As. Soc. Bengal ***72*** (2):163,1903.—*Oldenlandia auricularia* K. Schum. in Engl. & Prantle, Pflanzenfam. ***4*** (4):26, 1891; Pitard in Lecomte, Fl. Gén. Indo-Chine ***3***: 103, 1922.

Metabolus venosa Blume, Bijdr. 991, 1826.—*Hedyotis venosa* (Blume) Korth. in Ned. Kruidk. Arch. ***2*** (2):160, 1851; Craib, Fl. Siam. Enum. ***2***:50, 1932.

Hedyotis sarmentosa Craib in Kew Bull. ***1931***:278 & in Fl. Siam. Enum. ***2***:47, 1932.

Chiang Rai: Doi Pa Hom Pok, NW of Phan, *T 9718* & *9544*. Chiang Mai: Doi Chiang Dao, *T. Tuyama T 57288* (TI). Nan: Doi Pu Ka, *Kerr 494*—type of *H. sarmentosa* (BK). Loei: Phu Luang, from Ban Na Luang to north ridge, *T 105*. Phetchabun: Phu Miang, *T 11753* & *11754*; Phu Miang, along the way between the hill tribe villages, *T 11315*. Lamphun: en route from Ban Khun Tan to Doi Khun Tan, *T 9128* & *9340*. Chantaburi: Nonsi, Klawng, Kaw Chang, *Kerr 9168* (BK). Trat: Trat, *Dee 115*. Phra Nakhon: Bang Khen, *Kerr 19795* (BK).

Rather common throughout Thailand; in light deciduous, mixed and evergreen forest, at 5–1300 m alt.

Distr. Himalayas, India, Burma, Indochina, South China, Malaysia and Australia.

CRAIB described *H. sarmentosa* for the form characterized by copious branching and small and narrow leaves. T 11754 of our collections agrees perfectly with an isotype specimen of *H. sarmentosa* CRAIB in BK. This plant grows usually in clearings at edge of forests and on road banks. T 11315 has leaves of various breadth. On T 11753 the leaves on the middle and lower parts of the branches are broader, as in *H. auricularia* and the upper ones are narrower, similar to those of *H sarmentosa*. Thus there are intermediate forms between *H. auricularia* and *H. sarmentosa*. *H. sarmentosa* seems to occur in sunny place. Therefore I have reduced *H. sarmentosa* to synonymy.

2. **Hedyotis vestita** R. BR. ex G. DON, Gen. Syst. ***3***:526, 1834; HOOK. f., Fl. Brit. Ind. ***3***:58, 1880; KING & GAMBLE in Jour. As. Soc. Bengal ***72*** (2):159, 1903; RIDLEY, Fl. Mal. Pen. ***2***:49, 1923.—*Oldenlandia vestita* (R. BR. ex G. DON) DRAKE in Jour. de Bot. ***4***:211, 1895; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:98, fig. 11, 1922.

Chiang Rai: Doi Pa Hom Pok, NW of Phan, *T 9716*; along Nam Mae Kok about 15 km west of Chiang Rai, *T 10862*. Chiang Mai: Doi Suthep, *T 3972*. Nakhon Si Thammarat: Kao Luang, *Boonnak 706*; lower elevation of Khao Luang, interior of Wat Kiri Wang, *T 4556*; Wat Kiri Wang, on dry hill, *T 8300*; Thung Song, tropical rain forest near waterfall, *T 8232*.

Throughout Thailand; a widespread weed from open places to deep evergreen forest; at 50–1000 m alt.

Distr. North India, South China, Indochina and Malaysia.

3. **Hedyotis glabra** (ROXB.) R. BR. in WALL. Cat. 848, 1828; HOOK. f., Fl. Brit. Ind. ***3***:59, 1880; KING & GAMBLE in Jour. As. Soc. Bengal ***72*** (2):160, 1903; RIDLEY, Fl. Mal. Pen. ***2***:48, 1923; CRAIB, Fl. Siam. Enum. ***2***:41, 1932.—*Spermacoce glabra* ROXB., Fl. Ind. ed. CAREY ***1***:374, 1820.—*Oldenlandia glabra* (ROXB.) O. KUNTZE, Rev. Gen. ***1***: 292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:100, 1922.

Surat Thani: Surat Thani, *Ploenchit 836* & *868*. Chumphon: Chumphon, *K. T. Chai 1054*. Phangnga: Takuapa, Bang Paw, *Chirayapin 131* (BK).

In peninsular Thailand.

Distr. Cambodia and Malaya.

Specimens from Thailand have broader leaves than those from Penang, 1.7–2.5 cm wide and 6–11.5 cm long. Cambodian plants are larger in many respects: KIRA, *et al.* 964 has much longer cymes, up to 4 cm long and 2 cm in diameter.

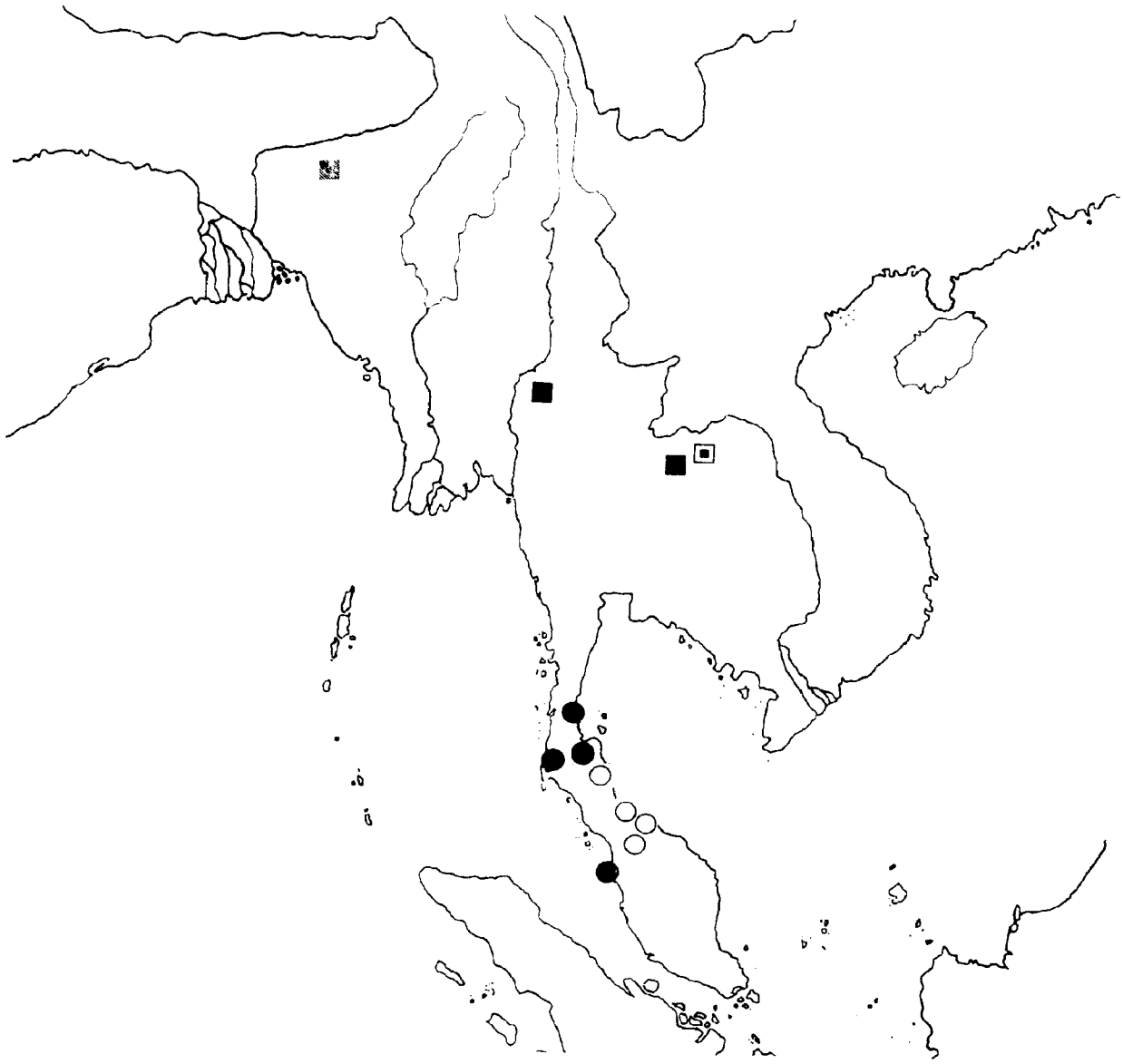

Fig. 1 Ranges of *Hedyotis fulva* HOOK. f. and *H. glabra* (ROXB.) R. BR., ■ : specimens and ▩ : literatures of *H. fulva* HOOK.f. var. *fulva;* ▣ : specimen of var *geddesiana* (CRAIB) FUKUOKA; ● : specimens and ⌒ : literatures of *H. glabra* (ROXB.) R. BR.

4. Hedyotis fulva HOOK. f., Fl. Brit. Ind. ***3***: 58, 1880.

Hedyotis dawsoniana CRAIB, Kew Bull. ***1931***: 218 & Fl. Siam. Enum. ***2***: 39, 1932.

Chiang Mai: Doi Nang Ka, *Put 3355* (BK). Loei: Phu Kradung, *Kerr 8675*—type of *H. dawsoniana* (BK); ibid. *Dee 59, 389* (BKF), *573* & *953*; ibid. *Uamphorn 126* (BKF);

ibid. *T 8852* & 9002; Phu Ruea, *Smitinand 101* (BKF) ; Wang Saphung, *Dee 389* (BKF).

In North and Northeast Thailand, in open grassland at 1200 m alt.

Distr. Assam.

4a. Var. **geddesiana** (CRAIB) FUKUOKA stat. nov.—*Hedyotis geddesiana* CRAIB in Kew Bull. ***1931***:221 & Fl. Siam. Enum. ***2***:41, 1932.

Ubon Thani: Ta Uten, Nakhon Panom, *Kerr 8470*—type (BK).

CRAIB notes that this species is similar to *H. fulva* of Assam, from which it differs in villosity. On the specimens from Phu Kradung, however, the pubescence is very variable. Specimen T 9002 is almost glabrous, not scabrous both on leaves and stems; in DEE 953, the leaves are scabrous and without pilose hair, but the stems are covered with yellowish pilose hairs along the grooves; and DEE 89 is densely covered with yellowish pilose hairs on the leaves and the grooves on the stems. With such variability we can not distinguish *H. dawsoniana* from *H. fulva* by their villosity. The former may be a villous form of the latter. I have never examined actually the type specimen of *H. fulva,* but the above observation is certified by examining the photograph of that.

The difference between *H. dawsoniana* and *H. geddesiana* appears only in the shape of the leaf. Therefore, we may better treat *H. geddesiana* as a variety of the former species.

Specimen T 8852 has rather broader leaves, 1–1.8 cm wide and larger cymes, 4.5 cm long and 3 cm in diameter. T 9002 has, on the contrary, longer leaves, 5 cm long and diverse inflorescences, up to 4 cm in width.

CRAIB described the floral parts of this species as 5-merous. In my observations, however, they are 4-merous as are the other members of this genus: calyx-lobes 4, corolla-lobes 4, and anthers 4. In addition to CRAIB's original description, the bilobed style is sparsely covered with pilose hairs.

5. Hedyotis hirta RIDLEY in Kew Bull. ***1926***:472; CRAIB, Fl. Siam. Enum. ***2***:42, 1932.

Phangnga; phangnga, *Haniff* & *Nur 3871*—type (SING).

Distr. Known only from the type locality.

6. Hedyotis pachycarpa RIDLEY in Jour. E. M. S. Mus. ***10***: 140, 1920 & Fl. Mal. Pen. ***2***:50, 1923; CRAIB, Fl. Siam. Enum. ***2***:44, 1932.

Oldenlandia valida PIERRE ex PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:104, fig. 11, 1922.

Loei: Phu Tong, *Kerr 8875* (BK). Pattani: Kao Kalakiri, *Kerr 14938* (BK). Phangnga: limestone hill, east of Phangnga, *T 7839* & *14719*. Nakhon Si Thammarat: Kao Kao, Thung Song, *T 8183*. Trang: lower elevation of Khao Chong, *T 6994*.

Rare in East Thailand and common in peninsular Thailand, in open places or in

light forest, at less than 1000 m alt.

Distr. South Vietnam, Cambodia, and Malaya.

7. **Hedyotis tetrandra** (ROXB.) CRAIB, Fl. Siam. Enum. ***2***:49, 1932.—*Rondeletia tetrandra* ROXB., Hort. Beng. 85, 1813 & Fl. Ind. ed. CAREY ***2***:136, 1824.

Hedyotis macrophylla WALL. ex WIGHT et ARN., Prodr. Fl. Ind. Or. ***1***:408, 1834; HOOK. f., Fl. Brit. Ind. ***3***:54, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):162, 1903; RIDLEY, Fl. Mal. Pen. ***2***:50, 1922.

Chumphon: Ta Ngaw, *Kerr 11480* (BK); Siepyuan, *Put 943* (BK). Ranong: Kopoe, *Kerr 16687* (BK). Pattani: Kao Kalakiri, *Kerr 7797* (BK). Nakhon Si Thammarat: Khao Kao, Thung Song, *T 8187*.

In peninsular Thailand: in open places or in evergreen forest; at 50–900 m alt.

Distr. Malaya.

8. **Hedyotis philippensis** (WILLD.) MERR. ex C. B. ROBINSON in Philip. Jour. Sc. Bot. ***6***:222, 1911.

Hedyotis congesta R. BR. ex G. Don, Gen. Syst. ***3***:526, 1934; HOOK. f., Fl. Brit. Ind. ***3***:61, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):161, 1903; RIDLEY, Fl. Mal. Pen. ***2***:51, 1923; CRAIB, Fl. Siam. Enum. ***2***:39, 1932.—*Oldenlandia congesta* (R. BR. ex G. DON) O. KUNTZE, Rev. Gen. ***1***:292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:105, fig. 11, 1922.

Hedyotis densa CRAIB in Kew Bull. ***1931***:219 & Fl. Siam. Enum. ***2***:39, 1932.

Ranong: Kao Pawta Luang Keo, Muang Ranong, *Kerr 16952*—type of *H. densa*(BK).

In Southeast and peninsular Thailand: at lower elevations up to 500 m alt.

Distr. Laos, Cambodia, Malaya, Borneo, and the Philippines.

The type specimens of *H. philippensis and H. congesta* have not been seen. Comparing the plants from Penang, the type locality of the former, with the materials of the Philippines, no differences have been found.

CRAIB described *H. densa* from Ranong as characterized by the acutely angled stem, the narrower leaves with more conspicuous veins, the cyme bearing the more numerous flowers, and the longer and narrower calyx-lobes. However, *H. philippensis* is very variable in many respects. The ridge of the stem is obtuse, acutely angled, or almost winged. The veins of the leaves are conspicuous or not, and the width varies from 1.7 cm to 5 cm. In the specimen from Singapore (TOGASHI & MURATA, June 12, 1964), the calyx-lobes are slightly narrower. The number of the flowers on a axillary cyme is very variable. Thus CRAIB's species suggests a form growing in sunny places. Hence, *H. densa* is considered as a synonym of *H. philippensis*.

9. **Hedyotis subcarnosa** CRAIB, Fl. Siam. Enum. ***2***:48, 1932.

Hedyotis prostrata HOOK. f., Fl. Brit. Ind. ***3***:61, 1880 (non BLUME).—*Oldenlandia*

prostrata (HOOK. f.) PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:101, 1922 (non BLUME).

Nong Khai: Chaiyaburi, *Kerr 8524* (BK). Nakhon Nayok: between log cabin to Hiewsai waterfall, Khao Yai National Park, *T 7464*. Trat: Kao Kuap, *Kerr 17709* (BK). Surat Thani: Phrasaeng, *Kerr 12482* (BK). Trang: Kantang, *Kerr 17486* (BK); Kao Libong, *Kerr 19086* (BK). Songkhla: Wang Yai, *Kerr 14777* (BK).

Throughout Thailand, up to 800 m alt.

Distr. Burma and Cambodia.

10. Hedyotis rosmarinifolia (PITARD) CRAIB, Fl. Siam. Enum. **2**:47, 1932.—*Oldenlandia rosmarinifolia* PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:47, 1922.

Loei: Phu Kradung, on the plain at its summit, *T 480, 830, 1251, 8864* & *9018*; ibid. *Smitinand* & *Floto 5941*. Trat: Kao Kuap, *Kerr 17742* (BK); ibid. *Put 2900* (BK).

In Northeast and Southeast Thailand; on open sandy places, at 600–1200 m alt.

Distr. Cambodia.

In T 803, the main axil creeps on sandy ground and bearing branches with or without flowers, decumbent and shorter than those of the other materials, up to 12 cm tall. In this specimen, also, the calyx-lobes are not ciliate.

11. Hedyotis uncinella HOOK. et ARN., Bot. Beech. Voy. 192, 1833; HOOK. f., Fl. Brit. Ind. **3**:56, 1880; KANJILAL & al., Fl. Assam. **3**:38, 1939.—*Oldenlandia uncinella* (HOOK. et ARN.) O. KUNTZE, Rev. Gen. 293, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:126, 1922.

Hydyotis uncinella var. *cephalophora* CRAIB, Fl. Siam. Enum. **2**:50, 1932.

Chiang Rai: along the highway between Chiang Rai and Chiang Khong, *T 11201*. Chiang Mai: Ban Yang, at middle elevation of Doi Inthanon, *T 2482*. Chaiyaphum: Huai Pathao, *S. N. 242* (BKF).

In North and Northeast Thailand; in deciduous forest, at 500-700 m alt.

Distr. Assam, Vietnam, Laos, Cambodia, South China, and Formosa.

CRAIB described var. *cephalophora* from Khasia, distinguishing it from Chinese plants by the narrower and petioled leaves and more pectinate stipules. As mentioned in the key, however, this is very variable in various features. According to these characters cited by CRAIB, we can not distinguish Chinese plants from Khasia ones.

In T 2482, the lower leaf-surfaces are pale and there are fewer flowers in a cyme, sometimes only one.

12. Hedyotis nodiflora WALL. ex G. DON, Syst. **3**:526, 1834; CRAIB, Fl. Siam. Enum. **2**:43, 1932.

Chantaburi: Kao Kuap, Krat, *Put 2902* (BK) & *3018* (BK). Trat: Muang Trat, *Dee 27* (BKF); Lem Dan Kao, Kaw Chang, *Kerr 9304* (BK).

In Southeast Thailand.
Distr. Burma.

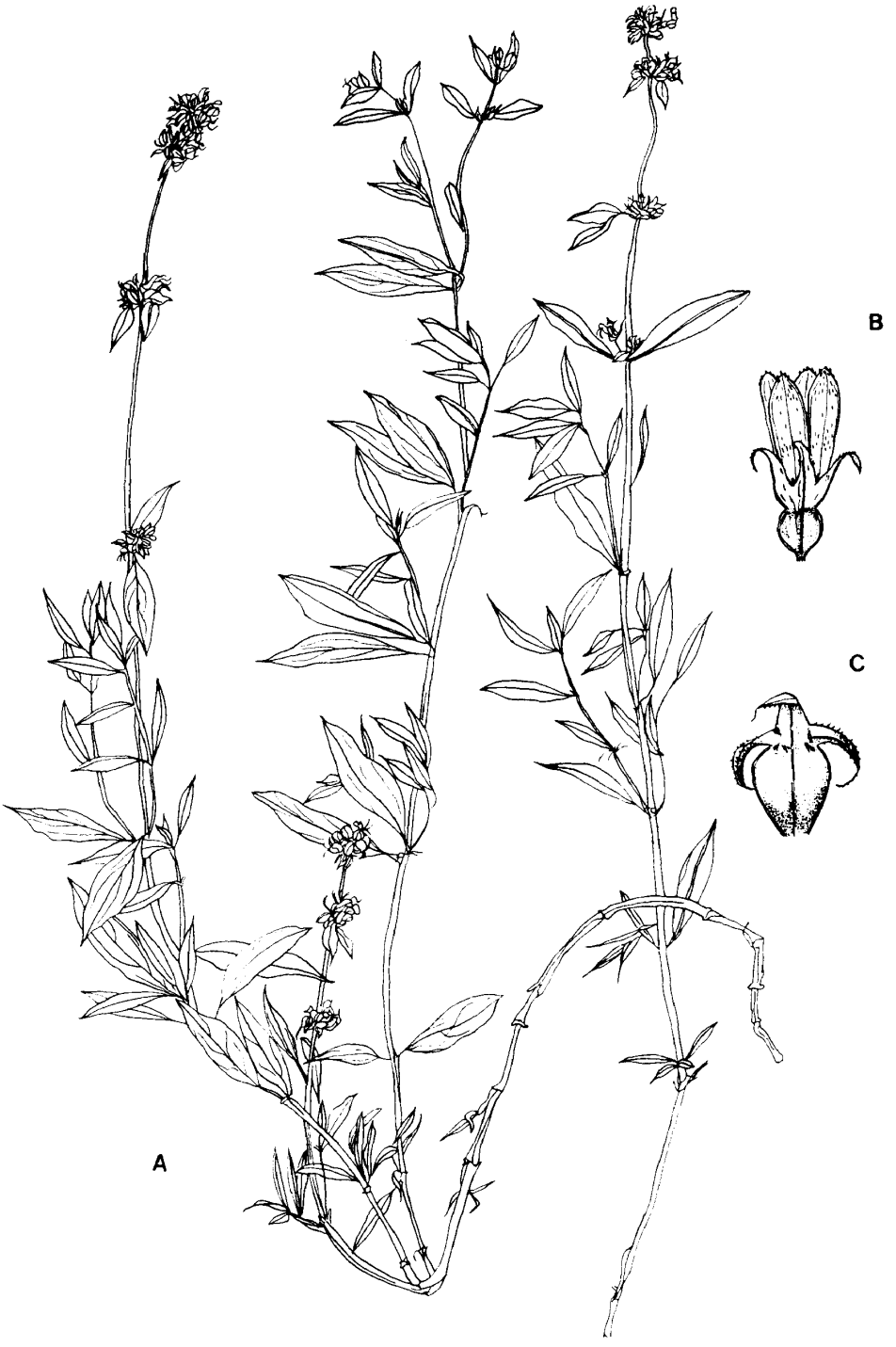

Fig. 2 *Hedyotis rosmarinifolia* (PITARD) CRAIB A. Whole plant (x 1/2), B. Flower (x 5), C. Capsule (x 5). (del. M. Hasegawa)

Fig. 3 *Hedyotis decora* GEDDES A. Whole plant (x 1/2), B. Flower (x 5), C. Capsule (x 5). (del C. Higashiura)

13. Hedyotis decora GEDDES in Kew Bull. ***1931***:219; CRAIB, Fl. Siam. Enum. ***2***:39, 1932.

Nakhon Si Thammarat: higher elevation of Khao Luang, *T 4851, 4859* & *8429*; Khao Luang, *Kerr 15497*—type (BK); ibid. *Ploenchit 412*; ibid. *OCKUBE 314, 339, 357* & *418*.

Endemic to Khao Luang; common on grassland, in thickets in clearing and in dense evergreen forest, at 1300–1786 m alt.

This is a very variable species: subshrub, 30–60 cm tall, erect or decumbent, much branching; leaves thick herbaceous, 2.5–9.5 cm long, 0.7–2.8 cm wide, lateral veins 3–5 pairs, obscure; cyme 2–7 cm long, 1–5 cm in diameter; corolla-tube 2.5–3 mm long, the lobes 2–2.5 mm long; capsule glabrous, 2 mm long and wide, terminated by the erect or slightly spreading, calyx-lobes 1 mm long, loculicidally and septicidally splitting.

14. Hedyotis elegans WALL. ex KURZ in Jour. As. Soc. Beng. ***46*** (2):133 & 135, 1877; HOOK. f., Fl. Brit. Ind. ***3***:53, 1880; CRAIB, Fl. Siam. Enum. ***2***:40, 1932.—*Oldenlandia elegans* (WALL. ex KURZ) O. KUNTZE, Rev. Gen. ***1***:292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:118, 1922.

Chaing Rai: interior of Ban Lang Lat, along the upper course of Nam Mae Lao, *T 3481*; northern slope of Doi Pacho (Doi Langka), *T 3652*. Chiang Mai: Doi Nang Ka, *Put 3291* (BK) & *3363* (BK). Loei: north ridge of Phu Luang, *T 1242*; eastern slope of Phu Luang, *T 1799* & *1810*.

In North and Northeast Thailand; in open places or in light forest, at 1000-1500 m alt.

Distr. Burma, Vietnam, Laos, and Cambodia.

15. Hedyotis tetrangularis (KORTH.) WALP. in Ann. Bot. Syn. ***2***:769, 1851–52; CRAIB, Fl. Siam. Enum. ***2***:49, 1932; MERR. & METCALF in Lingnan Sci. Jour. ***16***:400, 1937; MERR. in Jour. Arn. Arb. ***23***:193, 1942.—*Diplophragma tetrangularis* KORTH. in Nederl. Kruidk. Arch. ***2***:149, 1851.

Oldenlandia subdivaricata DRAKE in MOROT. Jour. de Bot. ***1895***: 211; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:124, 1922.

Ubon Ratchathani: Bang Boong, Ubon Ratchathani, *Lakshnakana 890* (BK). Si Sa Ket: Si Sa Ket, *Ploenchit 1461* (BKF); Kanthararom, *Smitinand 601*. Surat Thani: Kantuli, *Put 4122* (BK). Satun: Satun, *Kerr 13694* (BK); Thung Nui, *Smitinand 7133* (BKF).

In East, Southeast and Peninsular Thailand.

Distr. South China, Vietnam, Cambodia, Sumatra, and Borneo.

SMITINAND 601 shows the same habit as *H. punicea*, 10–12 cm tall. In this specimen, the calyx-lobes are as long as those of *H. punicea*, i.e. 1 mm long and 0.5 mm wide. How-

ever, the ovary is glabrous and the leaf longer, 1.5–2.3 cm long. Thus this is not similar to *H. punicea*. PLOENCHIT 1461 shows the stipule with trified apex. In SMITINAND 7133, the stipule is larger, 1–4 mm long and the leaf is 1–4 mm in width.

Although no authentic specimen of *O. subdivaricata* from Indochina has been seen, it is better to follow to CRAIB and MERRILL than to consider this as a synonym of *H. tetrangularis*.

16. Hedyotis corymbiformis GEDDES in Kew Bull. ***1931***:217; CRAIB, Fl. Siam. Enum. ***2***:39, 1932.

Chanthaburi: Tamun, Chanthaburi, *Kerr 9707*—isotype (BK); Pratrong, Pong Nam Ron, *Smitinand 3583*; ibid. *Boonnak 560*. Trat: Trat, *Dee 112* (BKF).

Endemic to Southeast Thailand; at edge of evergreen forest or in old clearings, at lower elevation up to 300 m alt.

As mentioned by GEDDES, this species is related to *H. contracta* of Indochina, from which it differs in the shorter calyx with straight lobes and in the longer capsules, 4 mm long including the calyx-lobes, and 2 mm in width.

17. Hedyotis diversifolia GEDDES in Kew Bull. ***1931***: 220; CRAIB, Fl. Siam. Enum. ***2***:40, 1932.

Trat: Baw Rai, Krat, *Kerr 9464*—isotype (BK); Kao Kuap, Krat, *Kerr 17775* (BK); Trat, *Dee 69* (BKF) & *141*.

Endemic to Southeast Thailand.

This species is similar to *Oldenlandia kamputensis* PITARD of Cambodia, from which it differs in its smaller inflorescences, smaller floral parts, and thinner leaves. In T. KIRA & al. 312 identified as *O. kamputensis*, the corolla is longer than that given in the original description, the tube being 7 mm long, and the lobes 2 mm long and recurved.

18. Hedyotis scabra WALL. ex KURZ in Jour. As. Soc. Beng. ***46*** (2):133 & 136, 1877; HOOK. f., Fl. Brit. Ind. ***3***:62, 1880; CRAIB, Fl. Siam. Enum. ***2***:47, 1932.

Loei: north ridge of Phu Luang, *T 1217*. Tak: Ban Musoe, *T 8636*; Me Sot, *Kerr 6161* (BK & SING).

In North and Northeast Thailand; in open places, in deciduous or evergreen forest, at 200–1200 m alt.

Distr. Burma and North Vietnam.

19. Hedyotis coronaria (KURZ) CRAIB, Fl. Siam. Enum. ***2***:38, 1932.—*Scleromitrion coronarium* KURZ in Jour. As. Soc. Beng. ***46*** (2):136, 1877.

Hedyotis connata HOOK. f., Fl. Brit. Ind. ***3***:62, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):136, 1903.—*Oldenlandia connata* (HOOK. f.) O. KUNTZE, Rev. Gen. ***1***:292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:110, fig. 12, 1922.

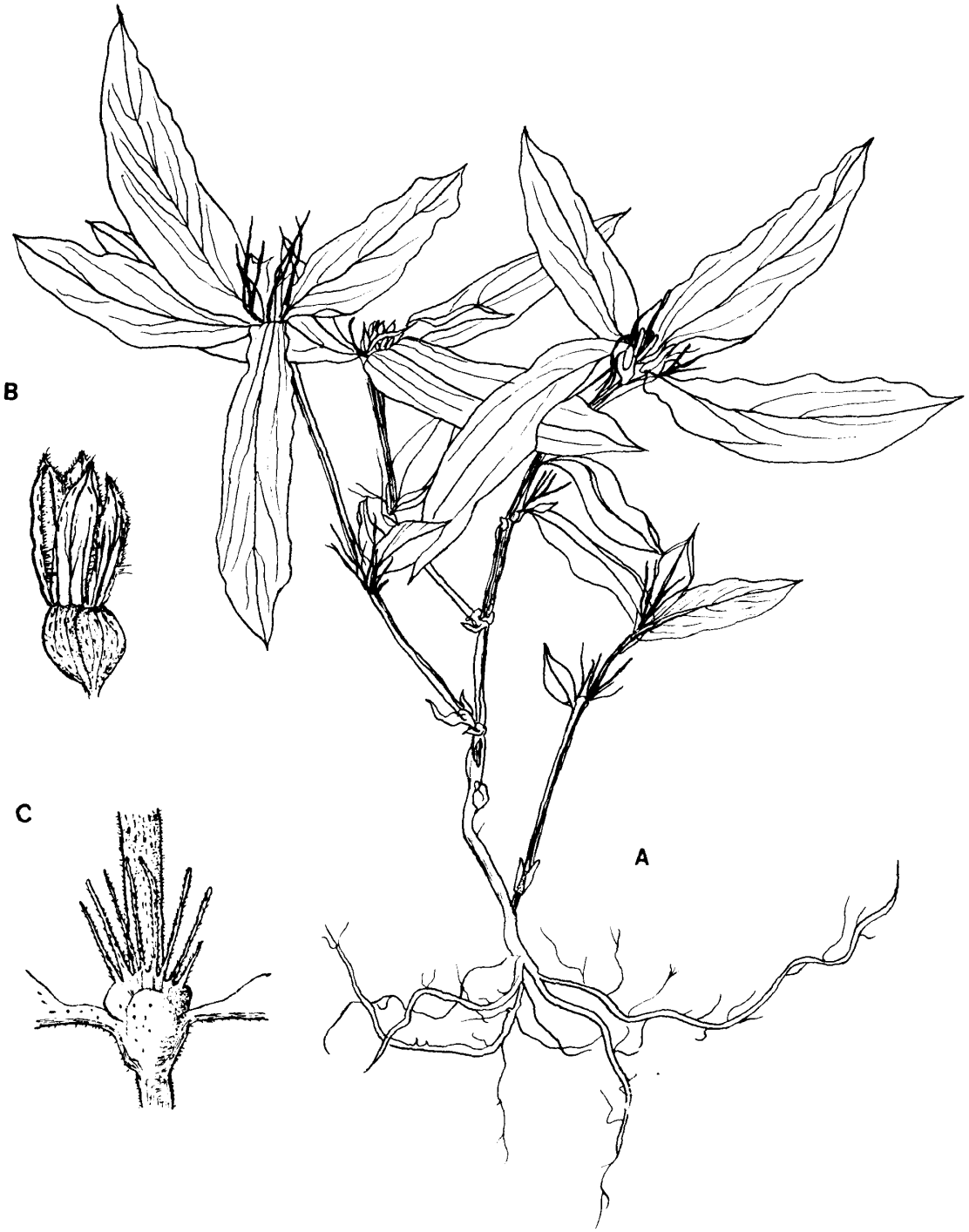

Fig. 4 *Hedyotis coronaria* (KURZ) CRAIB A. Whole plant (x 4/5), B. Capsule (x 4), C. Stipule (x 2). (del M. Hasegawa)

Hedyotis coronata WALL. ex HOOK.f. et JACKSON, Ind. Kew. **1**:1101, 1895; RIDLEY, Fl. Mal. Pen. **2**:48, 1923.—*Oldenlandia coronata* (WALL. ex HOOK. f. et JACKSON) WILLIAMS in Bull. Herb. Boiss. sér. 2, **5**:950, 1905.

Chiang Rai: Doi Pa Hom Pok, NW of Phan, *T 9545*; along Nam Mae Kok, about 15 km west of Chiang Rai, *T10864*. Chiang Mai: Fang Hill, north of Agricul. Exp. Station, *Smitinand 16749* (BKF); en route from Mae Klang waterfall to Ban Yang, along Nam Mae Klang on approach to Doi Inthanon, *T 2299*. Loei: Phu Luang, from Ban Na Luang to north ridge, *T 1051*. Chanthaburi: Chanthaburi, *Boonnak 159*. Rachaburi: Bang Taphan, *Keith 398* (SING). Nakhon Si Thammarat: Khao Luang, *Sanan 244*.

Common throughout Thailand; in dry ground in mixed forest and in sunny places, at 100–800 m alt.

Distr. Assam, Burma, Yunnan, Vietnam, Malaya, and the Philippines.

20. Hedyotis tenelliflora Blume, Bijdr. Fl. Ned. Ind. ***14***:971, 1826; Craib, Fl. Siam. Enum. ***2***:49, 1932.—*Oldenlandia tenelliflora* (Blume) O. Kuntze, Rev. Gen. ***1***:292, 1891; Pitard in Lecomte, Fl. Gén. Indo-Chine ***3***:106, 1922.

Chiang Rai: higher elevation of Doi Tung, *T 11072*. Chiang Mai: Chiang Dao, *Khanthachai 159* (BKF); Me Chem, *Kerr 6291* (BK). Phitsanulok: Phu Rom Rot, one of the peaks of Phu Miang, *T 11588*. Trang: Chawng, *Kerr 15198* (BK).

In North and Peninsular Thailand; in rocky or pebbly places, in grassy fields or in light evergreen forest, at 50–1500 m alt.

Distr. Assam to South China, Formosa, South Japan, Indochina, and Malaysia.

20a. Var. **kerrii** (Craib) Fukuoka comb. nov.—*Oldenlandia tenelliflora* (Blume) O. Kuntze var. *kerrii* Craib in Kew Bull. ***1911***:388.—*Hedyotis kerrii* (Craib) Craib, Fl. Siam. Enum. ***2***:42, 1932.

Chiang Rai: along the highway between Chiang Rai and Chiang Khong, *T 1196*. Chiang Mai: middle elevation of Doi Chiang Dao, *T 9849*; at higher elevation of Doi Suthep, *T 9415*; ibid. *B. Hayata* (TI); ibid. *T. Tuyama, 57196* (TI); Chiang Mai, *B. Hayata* (TI); Pa Mon, *OCKUBE 108-29* (TI); Ping Kong, *OCKUBE 919, 922* & *1053*. Lampang: Doi Palad, north of Lampang, *T 10860*. Lamphun: en route from Ban Khun Tan to Doi Khun Tan, *T 9116* & *9117*; higher elevation of Doi Khun Tan, *T 9299*.

In North Thailand; common on dry ground in light deciduous or mixed forest, at 500–1500 m alt.

Distr. Indochina.

21. Hedyotis verticillata (L.) Lamk., Tabl. Encycl. ***1***:271, 1791; Craib, Fl. Siam. Enum. ***2***:51, 1932.—*Oldenlandia verticillata* L., Mant. Pl. ***1***:40, 1767.

Hedyotis hispida Retz., Obs. Bot. ***4***:23, 1789; Hook. f., Fl. Brit. Ind. ***3***:60, 1880; King & Gamble in Jour. As. Soc. Beng. ***72*** (2):166, 1903; Ridley, Fl. Mal. Pen. ***2***:52, 1923.—*Oldenlandia hispida* (Retz.) Lamk., Tabl., Encycl. ***4***:536, 1798; Pitard in Lecomte, Fl. Gén. Indo-Chine ***3***:109, fig. 11, 1922.

Chiang Rai: Doi Pa Hom Pok, NW of Phan, *T 9539* & *9715*. Phitsanulok: Tung

Salaeng Luang National Park, near waterfall, *T 11254*. Ranawng: Kaw Chang, *Kerr 16601* (BK). Trang: Kao Kao, Ban Ta Do, *Rabil 395* (BK).

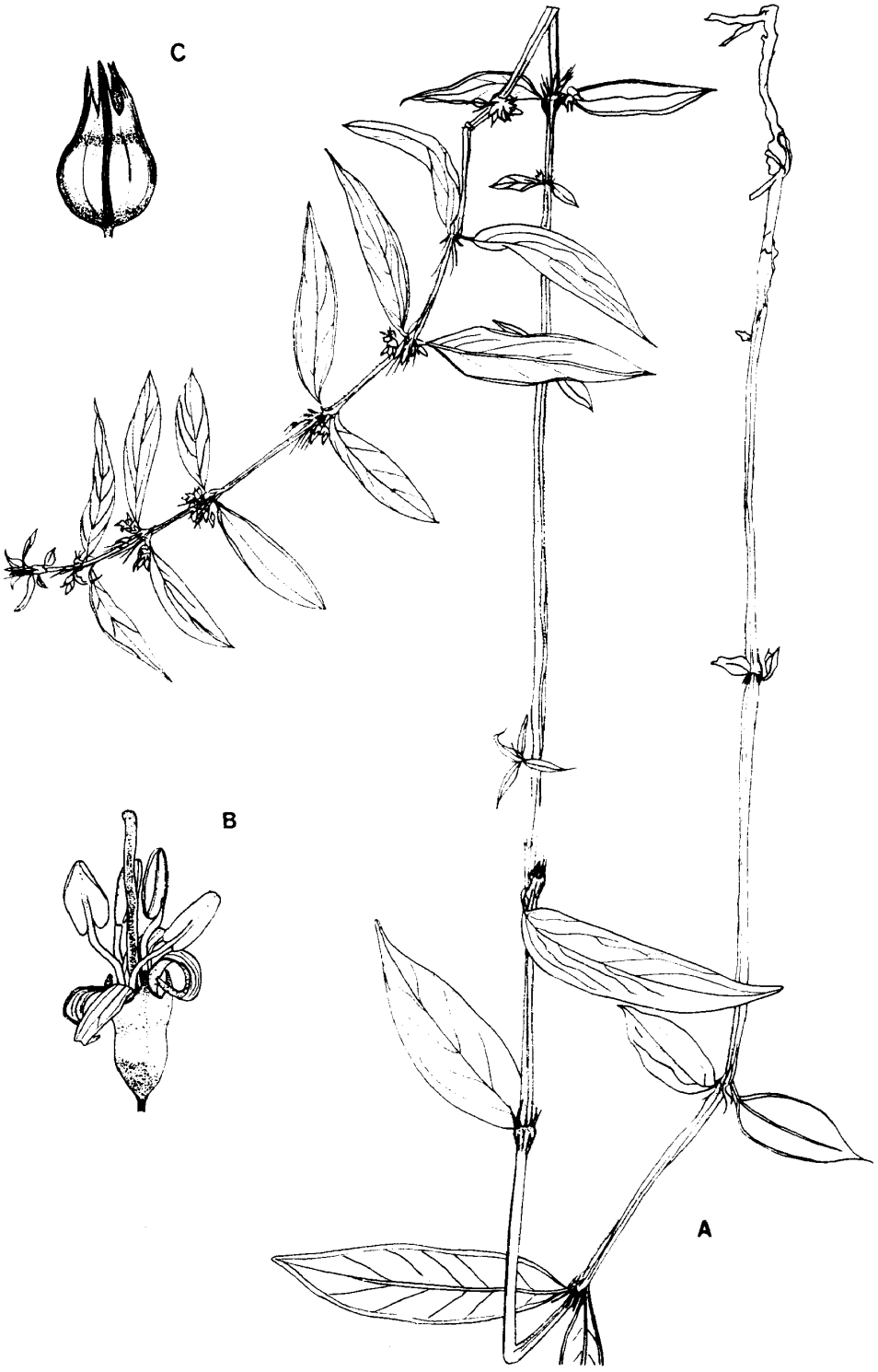

Fig. 5 *Hedyotis tenelliflora* BLUME var. *kerrii* (CRAIB) FUKUOKA A. Whole plant (x 1/2), B. Flower (x 5), C. Capsule (x 5). (del. M. Hasegawa)

In North and Peninsular Thailand; from open places to evergreen forest, at 5–800 m alt.

Distr. Himalayas, India, South China, Ryukyus, Indochina, Malaysia, and Micronesia.

22. **Hedyotis pinifolia** WALL. ex G. DON, Gen. Syst. ***3***:526, 1834; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):166, 1903; RIDLEY, Fl. Mal. Pen. ***2***:52, 1923; CRAIB, Fl. Siam. Enum. ***2***:44, 1932.—*Oldenlandia pinifolia* (WALL. ex G. DON) O. KUNTZE, Rev. Gen. ***1***:292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:108, 1922.

Chiang Mai: Doi Suthep, *T. Tuyama T 57077* (TI). Lampang: near Li, South of Lampang, *T. Tuyama T 57066* (TI). Loei: Sithan, *Bunpheng 17*. Kanchanaburi: Praten, *Kerr 19885*(BK). Prachin Buri: Sriracha, *D. J. Collins 1741* (BK); ibid. *Put 471* (BK). Prachuap Khiri Khan: Hua Hin, *Kerr 13462* (BK). Surat: Surat, *Kerr 11276* (BK). Satun: Langu, *Kerr 13954* (BK).

Throughout Thailand.

Distr. Vietnam, Cambodia, Malaya, Sumatra, Java, and Borneo.

23. **Hedyotis similis** GEDDES in Kew Bull. ***1928***:241; CRAIB, Fl. Siam. Enum. ***2***:47, 1932.

Yala: Khao Kalakiri, *Kerr 7761*—type (BK); Bannang Sta, *Kerr 7326* (BK); Yala, *Put 3692* (BK).

In Peninsular Thailand.

Distr. North Malaya.

24. **Hedyotis ridleyana** GRAIB in Kew Bull. ***1931***:278 & Fl. Siam. Enum. ***2***:46, 1932.

Ranong: La-um, c. 50 m alt. climbing in a bamboo forest, *Kerr 16458*—type (BK).

Only once collected at the type locality.

Judging from the photograph of the type specimen of this species and from its description, *H. ridleyana* seems to agree with *H. kingiana* ELM. from the Philippines. CRAIB, on the other hand, suggested that *Oldenlandia robinsonii* PITARD is the same as this species. *H. ridleyana* also seems to resemble *H. pitardiana* with recurved calyx-lobes, except that the flowers are sessile.

25. **Hedyotis prainiana** KING in Jour. As. Soc. Beng. ***72*** (2):158, 1903; RIDLEY, Fl. Mal. Pen. ***2***:45, 1923; CRAIB, Fl. Siam. Enum. ***2***:45, 1932.

Satun: Adang, c. 200 m alt., in open rocky ground, *Kerr 14021* (BK).

Only twice collected in Peninsular Thailand.

Distr. Also known from Penang.

I have examined only one specimen of this species, one scarcely fit for detailed ex-

amination. This species is still obscure in many respects.

26. Hedyotis hedyotidea (DC) MERR. in Lingnan Sci. Jour. ***13***:48, 1934; FUKUOKA in Acta Phytotax. Geobot. ***24***:31, 1969.—*Spermacoce hedyotidea* DC., Prodr. ***4***:555, 1830.

Hedyotis fruticosa RETZ., Obs. Bot. ***2***:8, 1781, non L.

Hedyotis macrostemon HOOK. et ARN., Bot. Beechey's Voy. 192, 1833.—*Oldenlandia macrostemon* (HOOK. et ARN.) O. KUNTZE, Rev. Gen. 292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:138, 1922.

Hedyotis nantoensis HAYATA in Jour. Coll. Sci. Tokyo Univ. ***30*** (1):142, 1911 & Icon. Pl. Formos. ***2***:83, 1912.

Distr. Vietnam, Cambodia, South China, and Formosa.

This species is distinguished by its recurving calyx-lobes and longer pedicels. As seen in the key, however, the indumentum is very variable. HAYATA noted that the flower characters of the Formosan plants did not at all resemble those of *H. hedyotidea* (as

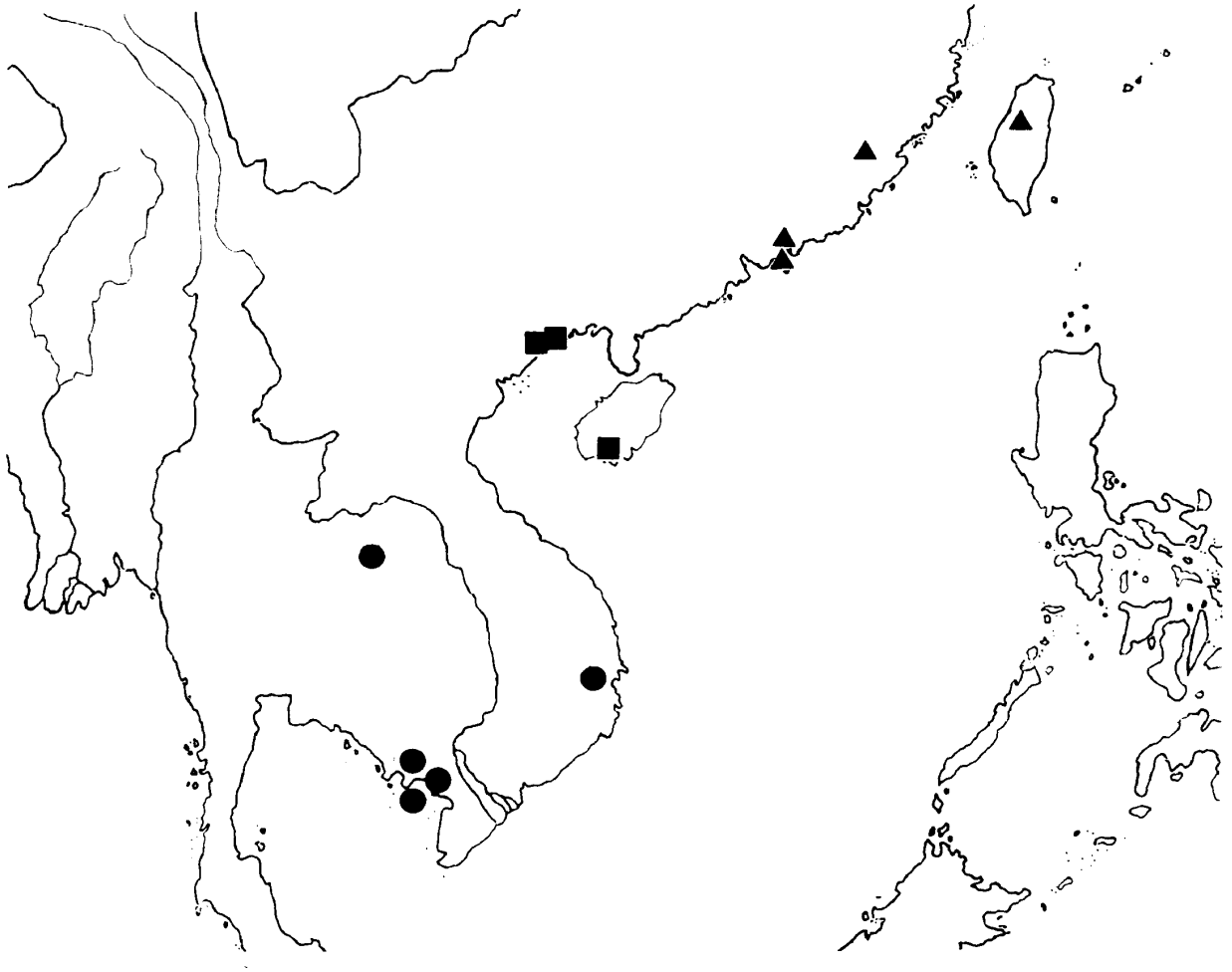

Fig. 6 Range of *Hedyotis hedyotidea* (DC.) MERR. ▲ : var. *hedyotidea* ; ■ : var. *obliquinervis* (MERR.) FUKUOKA ; ● : var. *pitardiana* (CRAIB) FUKUOKA.

H. macrostemon). However, I can not recognize any differences in the floral characters between *H. nantoensis* and *H. hedyotidea.*

26a. Var. **obliquinervis** (MERR.) FUKUOKA stat. nov.—*Hedyotis obliquinervis* MERR. in Lingnan Sci. Jour. ***14***:56, 1935.

Distr. North Vietnam and Hainan.

26b. Var. **pitardiana** (CRAIB) FUKUOKA stat. nov.—*Hedyotis pitardiana* CRAIB in Kew Bull. ***1931***:277 & Fl. Siam. Enum. ***2***:45, 1932.

Ubon Thani: Pu, *Kerr 8606* (SING). Chanthaburi: Chanthaburi, *A. Visterdal 1936* (SING); Kao Laming, Chanthaburi, *Kerr 9386* (SING). Trat: Trat, *Dee 161* (BKF); Klawng Mayom, Kaw Chang, *Kerr 6870*—type (BK). Thakhert et Ban Tham, *B. Hayata,* Dec. 11, 1921 (TI).

In Northeast and Southeast Thailand; at lower elevations up to 300 m alt.

Distr. Cambodia.

KERR 8606, identified by CRAIB as *H. dimorpha,* is clearly this variety, because its calyx-lobes are slightly recurved and its flowers are pedicelled.

27. Hedyotis capitellata WALL. ex G. DON, Gen. Syst. ***3***:527, 1834; HOOK. f., Fl. Brit. Ind. ***3***:56, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):159, 1903; RIDLEY, Fl. Mal. Pen. ***2***:46, 1923; CRAIB, Fl. Siam. Enum. ***2***:36, 1932.—*Oldenlandia capitellata* (WALL. ex G. DON) O. KUNTZE, Rev. Gen. 292, 1891; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:137, 1922.

Nakhon Si Thammarat: at the foot of Mt. Khao Luang, *OCKUBE 683.* Trang: Chong, *Smitinand 17619.*

In Southwest and Peninsular Thailand.

Distr. Burma, Southwest China, Vietnam, Malaya, Sumatra, Java, and Borneo.

This species is very variable, especially in the length of the pedicels and the corollas, the indumentum of the plant, and the number of flowers on a single capitate flowers. In Thailand are two characteristic varieties (see the key). The specimens cited by CRAIB as *H. capitellata, H. dimorpha,* and *H. pitardiana* should be reexamined.

27a. Var. **pedicellata** (PITARD) FUKUOKA comb. nov.—*Oldenlandia capitellata* (WALL. ex G. DON) O. KUNTZE var. *pedicellata* PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:138, 1932.

Phetchabun: Phu Miang, along the way between the hill tribe villages, *T 11328*; Phu Miang, *T 11757.* Loei: north ridge of Phu Luang, *T 1215* & *1216*; Phu Kradung, *T 900.*

Newly recorded for Northeast Thailand; climbing on trees in light or dense forest, at 1000–1500 m alt.

Distr. Known from Laos and Cambodia.

All the specimens cited above have the definite pedicels 1–2 mm long, glabrous ovaries and ciliate calyx-lobes. Specimen T 1216, identified as var. *pedicellata*, is densely covered with yellowish hairs in the axils of the inflorescences and rather sparsely scattered on the lower leaf-surface. In T 900 and 1215, the axils of the inflorescences are pubescent but the leaves are almost glabrous.

27b. Var. **pubescens** KURZ in Jour. As. Soc. Beng. ***44*** (2):135, 1877.

Hedyotis capitellata WALL. ex G. DON var. *mollissima* PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:138, 1922.

Hedyotis dimorpha CRAIB in Kew Bull. ***1914***:124 & Fl. Siam. Enum. ***2***:40, 1932.—*Oldenlandia dimorpha* (CRAIB) PITARD in LECOMTE, Fl. Gén. Indo-Chine *3*:155, 1923.

Nakhon Si Thammarat: eastern slope of Khao Luang, *T 5330.*

In North and rarely in Peninsular Thailand, at lower elevation.

Distr. North Burma, North Vietnam, and Laos.

CRAIB described *H. dimorpha* as having the ovary, calyx, pedicel, leaf, and stem densely covered with yellowish brown pilose hairs and corolla shorter. *H. dimorpha* can not be distinguished from *H. capitellata* by any character, except for these features. Therefore, CRAIB's species may be considered as a variety of *H. capitellata.*

28. Hedyotis lindleyana HOOK. ex WIGHT et ARN., Prodr. Fl. Ind. Or. ***1***:409, 1834; CRAIB, Fl. Siam. Enum. ***2***:42, 1932; HARA, Enum. Sperm. Jap. ***2***:19, 1952; FUKUOKA in Acta Phytotax. Geobot. ***24***:31, 1969.

Oldenlandia hirsuta L. f., Suppl. Pl. Syst. Veg. 127, 1781.—*Hedyotis hirsuta* (L. f.) SPRENG., Pl. Pugill. ***2***:35, 1815, non. LAMK.—*Anotis hirsuta* (L.f.) MIQ. ex BACKER et van SLOOTEN, Geillustr. Handb. Theeonkr. 203, 1924.

Hedyotis stipulata R. BR. ex HOOK. f., Fl. Brit. Ind. ***3***:63, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):160, 1903; RIDLEY, Fl. Mal. Pen. ***2***:48, 1923.—*Oldenlandia stipulata* (R. BR. ex HOOK.f.) PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***: 111, 1922.

Anotis formosana HAYATA, Icon. Pl. Formos. ***9***:54, 1920.

Chiang Mai: Doi Suthep, *Kerr 6371* (BK). Phitsanulok: one of the highest peaks of Phu Miang, *T 11674.*

In North Thailand; by path between grass fields, at 900–1400 m alt.

Distr. Himalayas, Assam, Laos, North Vietnam, China, Formosa, Quelpart, Japan, Malaya, and Java.

On T 11674, the capitate flowers has a distinct peduncle. The same feature is known in some plants from Japan. *Anotis formosana* from Mt. Taiping, Formosa, seems to be merely a form of *H. lindleyana.*

29. Hedyotis oligocephala (PIERRE ex PITARD) FUKUOKA comb. nov.—*Oldenlandia oligocephala* PIERRE ex PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:113, 1922.

Lamphum: en route from Ban Khun Tan to Doi Khun Tan, *T 9095.* Phitsanulok: Phu Rom Rot, one of the peaks of Phu Miang, *T 11578.*

This is newly recorded for Thailand, previously known only from South Vietnam. It occurs on rather moist ground in deep mixed forest, at 1000–1200 m alt.

Thai plants are much smaller than PITARD's description in many respects: herb 6–13.5 cm tall; leaf 3.5–10 cm long and 1.1–3.5 cm wide; peduncle 1.5–7.7 cm long, terminated by 1–3 heads.

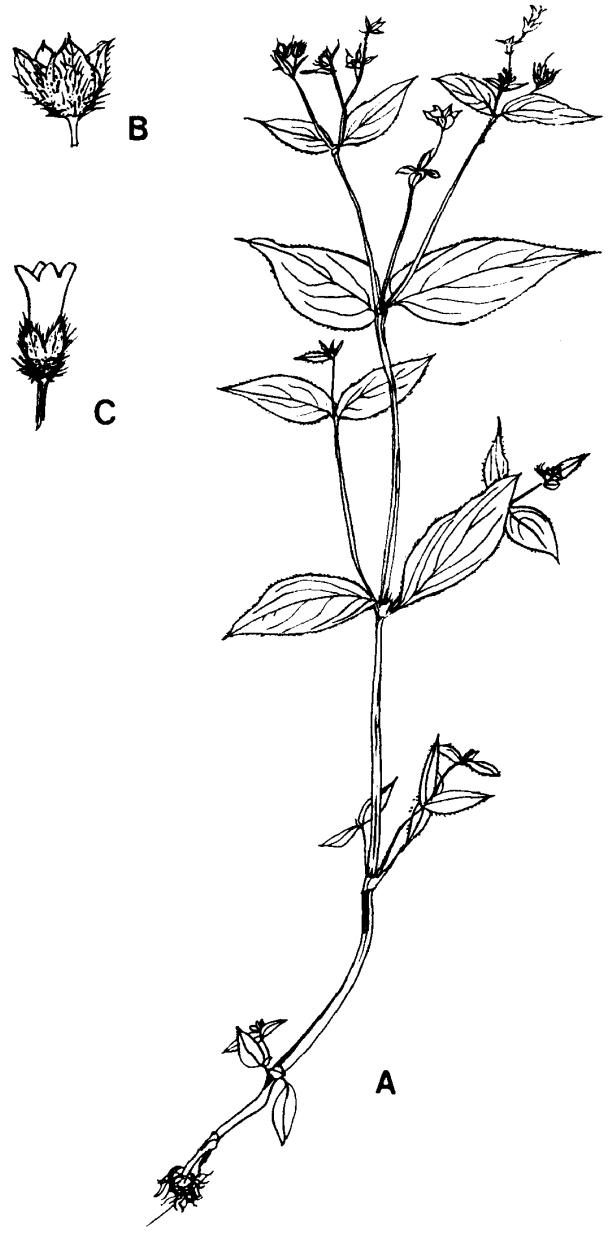

Fig. 7 *Hedyotis nalampooni* FUKUOKA A. Whole plant (x 2/3), B. Capsule (x 3), C. Flower (x 3). (del M. Hasegawa)

30. Hedyotis nalampooni FUKUOKA in Acta Phytotax. Geobot. ***24***:28, 1969.

Erect herb 13–20 cm tall. Stem almost terete, though with 4 ridges sparsely covered with setose hairs on the upper parts, the internodes 2.5–6 cm long. Leaf-blade thin herbaceous, ovate to oblong, acute to slightly acuminate at apex, the base rounded or cuneate, decurrent on to the petiole, the middle larger ones 1.8–3.5 cm long, 1–1.5 cm wide, the upper usually smaller and the uppermost ones bract-like, the lateral veins 4–5 in pairs, more or less impressed on the upper surface, sparsely hirsute, almost glabrous on the lower surface or rarely setose hairs on the midrib, paler; petiole 1–5 mm long; stipule adnate to the petiole, hirsute 2–3 mm long and 1–2 mm wide, the lobes 5–6, filiform. Inflorescences cymose, chiefly in the upper axils, 2.5–4.5 cm long, 2–7-flowered; pedicel of the terminal flower shorter, up to 1 mm long, those on the axillary ones longer, 5–20 mm long. Calyx-lobes 4, deltoid, green, acute at the apex, hirsute on margin and on the prominent midrib, otherwise glabrous, 1.1 mm long and 0.7 mm wide; corolla pale purple, funnel-shaped, the tube 2 mm long, almost glabrous, the lobes 4, deltoid, spreading or recurved, obtuse, sparsely hirsute at apex, 1 mm long; stamens 4, the anthers 0.5 mm long, the filaments adnate to the corolla, the free uppermost part 0.1 mm in length. Ovary blackish, densely hirsute, 0.7 mm long, 1 mm in diameter, the style slender, glabrous, about 2 mm long, the stigma 2-lobed, spreading, 1 mm long. Capsule herbaceous, blackish, later becoming pale brown, cup-shaped, sparsely hirsute, 2 mm long, 3.5 mm in diameter, loculicidally splitting, with persistent calyx-lobes at apex, 1.5 mm in length.

Chiang Mai: at higher elevation of Doi Suthep (Doi Pui), in gravelly place in light shade, at 1680 m alt., *T 9422*—type (KYO; isotype—BKF, TI).

This is allied to *Oldenlandia krewanhensis* PIERRE of Indochina, from which it differs in the herbaceous and smaller leaves with fewer lateral veins, the longer corolla tube, the distinctly bilobed stigma and the larger capsule.

31. Hedyotis pahompokae FUKUOKA in Acta Phytotax. Geobot. ***24***: 29, 1969.

Erect herb, luxuriantly branching, usually producing two spreading lateral branches at each node, even on the lowermost ones, 13–23 cm tall and 10–37 cm in diameter. Stem quadrangular with 4 narrow wings, glabrous, pale green or pale brownish purple in some portions. Leaf-blades herbaceous, 1.5–3.5 cm long and 0.5–1.5 cm wide, gradually reduced in size and becoming bract-like on the uppermost nodes both on the main axil and branches, ovate-lanceolate, gradually tapering towards the acuminate apex, broadly truncate or cordate at the base, slightly decurrent on to the petiole, ciliate and distinctly recurved on margin, brownish green, the midrib and 3–4 pairs of lateral veins impressed and hirsute on the upper surface, the lower surface pale green, more or less prominent and sparsely hirsute; petiole 1.5 mm long, with narrow wings from the decurrent leaf-blade; stipule pectinate, glabrous or sparsely hirsute, 1–2 mm long and 1–6 mm wide, the teeth 3–6, filiform, hirsute, up to 1 mm long. Inflorescences cymose, copiously branched dichasium; peduncle terminal and axillary, 1–2.5 cm long; pedicel of terminal flower up to 1 mm long; those of axillary 2–5 mm long, glabrous or sparsely hirsute. Calyx with

Fig. 8 *Hedyotis pahompokae* FUKUOKA A. Whole plant (x 3/5), B. Capsule (x 5), C. Flower (x 5). (del M. Hasegawa)

4 lobes, erect or spreading, ovate to lanceolate-oblong, acute at the apex, with prominent midrib, sparsely hirsute along margin and midrib, 1 mm long and 0.7 mm wide. Corolla pale pink, funnel-shaped, the tube 2 mm long, glabrous outside, the lobes 4, spreading or recurved, acute or obtuse at the apex, sparsely hirsute on margin and the midrib, 1 mm long. Ovary densely hirsute, 0.5 mm long, 1 mm in diameter during flowering; the style

glabrous, 2.6 mm long, the stigma 2-lobed, spreading or slightly recurved, 2–3 mm long. Stamens 4, the anthers 0.5 mm long, the filaments adnate to corolla, uppermost part remaining free, 0.5 mm in length. Capsule cup-shaped, didymous, hirsute, 2.5–3 mm long, 1.5–2 mm wide, with persistent spreading calyx-lobes at apex 2 mm long, septicidally and loculicidally splitting.

Chiang Rai: Doi Pa Hom Pok, NW of Phan, in open place at ridge, 1800 m alt. *T 9562*—type (KYO, isotype—BKF, A, AAU, K, L, TI).

This is similar to *Oldenlandia krewanhensis* PIERRE of Indochina and to *O. wightii* HOOK. f. from India. The present species differs from the former in the taller stems, the smaller leaves with fewer lateral veins, the distinctly bilobed stigmas, and the larger capsules, and from the latter in the erect habit, the ovate-lanceolate leaves with glabrous or rarely sparsely hirsute on the veins and the diverse inflorescence. It is distinguished from *H. umbellata* (L.) LAMK. of India in the erect habit, the lateral branch developing even at the upper half of a main axil, the broader leaf, and the fibrous root without the main one.

32. **Hedyotis wallichii** KURZ in Jour. As. Soc. Beng. ***45*** (2):136, 1876; CRAIB, Fl. Siam. Enum. ***2***:52, 1932.—*Oldenlandia wallichii* (KURZ) CRAIB in Kew Bull. ***1911***:388; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:120, 1922.

Oldenlandia rosea RIDLEY in Jour. Str. Br. Roy. As. Soc. ***59***:110, 1911 & Fl. Mal. Pen. ***2***:54, 1923.

Hedyotis impedita CRAIB in Kew Bull. ***1931***:275 & Fl. Siam. Enum. ***2***:42, 1932.

Nakhon Nayok: Sarika Waterfall, *Smitinand 7005* (BKF). Kanchanaburi: Praten, Kanchanaburi, *Kerr 19887* (BK). Chanthaburi: Klawng, Kaw Chang, *Kerr 9242* (BK). Prachuap Khiri Khan: Hua Hin, *Kerr 13433*—isotype of *H. impedita* (BK). Surat Thani: Bandon River, Wat Sa Uhm, *Seidenfaden 2153* (SING). Ho-Keam, *B. Hayata* (TI).

In Southwest, Southeast and Peninsular Thailand.

Distr. Burma and South Vietnam.

The typical form of *H. wallichii* shows the dwarf habit and much developed branches. In *H. impedita*, on the other hand, the habit is erect and the lateral branches are poorly developed, seeming consisting only of the lateral cyme. However, there are intermediate forms between the typical forms of both species. Therefore, we can not distinguish KURZ's species from CRAIB's.

33. **Hedyotis viarum** (CRAIB) FUKUOKA comb. nov.—*Oldenlandia viarum* CRAIB in Kew Bull. ***1931***:433 & Fl. Siam. Enum. ***2***:58, 1932.

Satun: Satun, *Kerr 13669*—isotype (BK).

In Peninsular Thailand.

Distr. Malaya.

Although I have not seen the type specimen of *H. dichotoma*, I have examined the specimens of *H. dichotoma* and *H. viarum* identified by CRAIB. These species differ in the capsule as mentioned by CRAIB. According to CRAIB's diagnosis the specimens from Penang and Singapore preserved in the Herbarium of Kyoto University are referable to CRAIB's species.

34. **Hedyotis dichotoma** KOEN. ex ROTH., Nov. Pl. Sp. 93, 1821.—*Oldenlandia dichotoma* (KOEN. ex ROTH.) HOOK. f., Fl. Brit. Ind. ***3***:67, 1880; CRAIB, Fl. Siam. Enum. ***2***:53, 1932.

Tak: Raheng (Tak), Doi Tung Cha, *Kerr 4607* (BK).

In North Thailand; at lower elevations up to 400 m alt.

Distr. India.

35. **Hedyotis chereevensis** (PIERRE ex PITARD) FUKUOKA comb. nov.—*Oldenlandia chereevensis* PIERRE ex PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:143, 1922.

Oldenlandia chereevensis var. *pilosa* CRAIB, Fl. Siam. Enum. ***2***:53, 1932.

Phetchabun: Phu Miang, *T 11750*; Phu Miang, along the way between the hill tribe villages, *T 11329*; Nam Lao forest, *Smitinand 453*. Phitsanulok: Tung Salaeng Luang National Park, *T 2117*. Loei: north ridge of Phu Luang, *T 1218*; Phu Kradung, *T 885* & *8806*; ibid. *Smitinand 4932*. Surat Thani: Ban Kawp Kep, *Kerr 13169*—isotype of var. *pilosa* (BK).

In North, Northeast and Peninsular Thailand; rather common in sunny places and in dense forest, at 50–1300 m alt.

Distr. Vietnam and Cambodia.

PITARD did not describe the pubescence inside the corolla of this species from Indochina. In Thai plants, the inside of the corolla is densely covered with pilose hairs. CRAIB also distinguished the Thai plants from the Indochinese ones as var. *pilosa*. In the Indochinese plants, however, the inside of the corolla is covered with pilose hairs, just the same with in the Thai ones. Therefore, we can not distinguish these two.

36. **Hedyotis gracilipes** (CRAIB) FUKUOKA comb. nov.—*Oldenlandia gracilipes* CRAIB in Kew Bull. ***1931***:441 & Fl. Siam. Enum. ***2***:55, 1932.

Nakhon Ratchasima: Dan Khun Khot, *Kerr 19924* (BK); Pak Thong Chai, *Kerr 8110* (BK) & *8128* (BK). Chanthaburi: Ban Ta Ruang, Chanthaburi, *Kerr 9720*—isotype (BK).

In East and Southeast Thailand; at lower elevations up to 300 m alt.

36a. Var. **longicalyx** (CRAIB) FUKUOKA comb. nov.—*Oldenlandia gracilipes* var. *longicalyx* CRAIB, Fl. Siam. Enum. ***2***: 55, 1932.

Loei: Phu Kradung, *Dee 252* (BKF) & *391*. Prachin Buri: Watthana Nakhon, *Put 1926*—isotype (BK).

Endemic to Northeast and East Thailand.

37. **Hedyotis pterita** BLUME, Bijdr. Fl. Ned. Ind. ***14***:972, 1826; BACKER & BAKH., Fl. Java ***2***:284, 1965.—*Oldenlandia pterita* (BLUME) MIQ., Fl. Ind. Bat. ***2***:193, 1857; CRAIB, Fl. Siam. Enum. ***2***:57, 1932.

Oldenlandia alata ROXB., Fl. Ind. ed. CAREY **1**:442, 1820; HOOK. f., Fl. Brit. Ind. **2**:70, 1880; RIDLEY, Fl. Mal. Pen. **2**:53, 1923; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:152, 1922.

Lampang: Lampang, *B. Hayata* (TI). Prachin Buri: Aranyap Pratet, *Put 2077* (BK). Prachuap Khiri Khan: Pak Tawan, Prachuap Khiri Khan, *Kerr 20520* (BK); Prachuap, *Kheo 19* (BKF); Khao Chong Grackok, near Bang Saphan, *T 7607*; stone-pit at Khao Chrongwan, *T 7642* & *7683*. Chumphon: Bang Taphan, *Keith 303* (SING); Bang Son, Chumphon, *Put 1055* (BK); Kaw Tao, *Kerr 11214* (BK). Khornkan, Donglarn, *Dee 843*.

Common in North and Peninsular Thailand; in open places or in light shady places, at lower elevations up to 150 m alt.

Distr. South East Asia.

38. **Hedyotis biflora** (L.) LAMK., Tabl. Encycl. **1**:272, 1791; FOSBERG in B. P. Bishop Museum Bull. **174**:19, 1943.—*Oldenlandia biflora* L., Sp. Pl. **1**:119, 1753; CRAIB, Fl. Siam. Enum. **2**:52, 1932.

Oldenlandia paniculata L., Sp. Pl. **2**:1667, 1764; HOOK. f., Fl. Brit. Ind. **3**:70, 1880; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:153, fig. 15 & 19, 1922; RIDLEY, Fl. Mal. Pen. **2**:53, 1923.

Phra Nakhon: Phra Nakhon (Bangkok), *Yamazaki* & *Murata 93*. Surat Thani: Surat Thani (Bandon), *G. Seidenfaden 2424* (SING).

Throughout Thailand; a weed common in open places, at lower elevations up to 300 m alt.

Distr. India, Indochina, Malaysia, Micronesia, Polynesis, China, Formosa, and Japan.

39. **Hedyotis diffusa** WILLD., Sp. Pl. **1**:566, 1798.—*Oldenlandia diffusa* ROXB., Hort. Beng. 11, 1814; HOOK. f., Fl. Brit. Ind. **3**:65, 1880; KING & GAMBLE in Jour. As. Soc. Beng. **72** (2):170, 1903; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:145, 1922; RIDLEY, Fl. Mal. Pen. **2**:54, 1923.

Chiang Rai: Me Kok, Me Kawng, below Ta Kao Pluak, *Garrett 234* (BKF). Nakhon Ratchasima: Sikhiu, *Smitinand 4455*; Ban Chum Seng, Nakhon Ratchasima, *Noe 144* (BK) & *206* (BK). Ratchaburi: Nawng Ke, *Collins 1630* (BK). Trang: Chawng, *Kerr 15159* (BK). Nakhon Si Thammarat: Tha Samet, *Kerr 14300* (BK) & *13533* (BK); Sichon, *Kerr 15675* (BK). Phatthalung: Sak, *Kerr 19265* (BK).

Throughout Thailand; common in sunny places, at lower elevations up to 400 m alt.

Distr. India to Japan, Indochina, and Malaysia.

40. **Hedyotis corymbosa** (L.) LAMK., Table. Encycl. **1**:272, 1791.—*Oldenlandia corymbosa* L., Sp. Pl. **1**:119, 1753; PITARD in LECOMTE, Fl. Gén. Indo-Chine **3**:146, 1922; RIDLEY, Fl. Mal. Pen. **2**:54, 1923; CRAIB, Fl. Siam. Enum. **2**:53, 1932.

Mae Hong Song: Mae Hon Song, *Smitinand 4575* (BKF). Chiang Mai: lower elevation of Doi Suthep, *T 9449*; in the ground of a temple, Chiang Mai, *T. Tuyama T 57243* (TI). Lampang: Lampang, *Winit 1412* (BKF). Chanthaburi: at foot of Kao Soi Dao, *T 7343*. Phra Nakhon: Bangkok (Bang Khen), *Yamazaki* & *Murata 92*; ibid. *Murata* & *Togashi* (Jan. 7 '64.). Nakhon Si Thammarat: interior of Wat Kiri Wang, at foot of Kao Luang, *T 5389*.

Throughout Thailand; rather common in open places, at lower elevations up to 300 m alt.

Distr. Tropical and subtropical regions of the Warld.

41. **Hedyotis ovatifolia** CAVAN., Icon. Pl. Hisp. ***6***:52, t. 373, 1809.—*Oldenlandia ovatifolia* (CAVAN.) DC., Prodr. ***4***:427, 1830; CRAIB, Fl. Siam. Enum. ***2***:57, 1932.

Oldenlandia nudicaulis ROTH., Nov. Pl. Sp. 96, 1821; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:150, 1922; RIDLEY, Fl. Mal. Pen. ***2***:53, 1923.—*Hedyotis nudicaulis* (ROTH.) WIGHT et ARN., Prodr. Fl. Ind. Or. ***1***:416, 1834.

Oldenlandia rosettifolia GEDDES in Kew Bull. ***1928***:242; CRAIB, Fl. Siam. Enum. ***2***:58, 1932.

Oldenlandia lakshnakarae CRAIB in Kew Bull. ***1931***:442 & Fl. Siam. Enum. ***2***:56, 1932.

Oldenlandia marcanii CRAIB in Kew Bull. ***1931***:443 & Fl. Siam. Enum. ***2***:57, 1932.

Mae Hong Song: along the road between Mae Sariang and Mae La Noi, *T 10322*, & *10325*. Chiang Rai: Doi Tung, en route from Ban Huai Khrai to Wat Doi Tung, *T 10975*; Doi Pa Hom Pok, NW of Phan, *T 9546* & *9714*; along the highway between Chiang Rai and Chiang Khong, *T 11208*. Chiang Mai: foot of Doi Chiang Dao, *T 9778*; middle elevation of Doi Chiang Dao, *T 9848*; en route from Mae Klang waterfall to Ban Yang, along Nam Mae Klang, on approach to Doi Inthanon, *T 2301*; Doi Suthep, *B. Hayata* (TI). Lampang: Tham Pha Thai in Huay Tak, *T 10633*. Tak: Lan Sang National Park, *T 8549*. Phitsanulok: Thung Salaeng Luang National Park, near waterfall, *T 11252*. Petchabun: Muang Pechabun, *Smitinand* & *Ploenchit 454*. Loei: Phu Kradung, *T 8745*; ibid. *Dee 179* (BKF); Sithan, Wang Saphung, *Smitinand 2016* & *4886* (BKF); Wang Saphung, *Dee 812*; Muang Loei, *Ploenchit 1336* (BKF). Phetchabun: Nam Nao forest, Muang Phetchabun, *Smitinand 454* (BKF). Si Sa Ket: Kanthararom, *Smitinand* & *Ploenchit 609*. Kanchanaburi: Kin, 120 km NW of Kanchanaburi, *Kostermans 1032* (SING).

In North, Northeast, Southwest, and Peninsular Thailand; very common in deciduous and evergreen forests, at 300–1000 m alt.

Distr. Himalayas, India, Indochina, Malaya, the Philippines, and Formosa.

In describing *H. rosettifolia* GEDDES distinguished it from *H. ovatifolia* by the longer anther 1.25 mm long and the rosette-like leaves. CRAIB based *H. lakshnakarae* and *H. marcanii* on the plants from Kanchanaburi. The former has long anthers 1 mm long and

the latter anthers 2 mm in length, also larger corollas 4 mm long with longer pilose hairs inside. In the size and form of various parts of the plants, however, *H. ovatifolia* is very variable. In the length of the corollas and anthers various intermediate forms between those of *H. ovatifolia* and those of *H. marcanii* are recognizable. The length of the hairs inside the corolla seems to be correlated with the size of the corolla. Also there are the intermediate forms between the rosette-leaved forms and those with leaves as in the typical *H. ovatifolia* are not specifically separable.

42. **Hedyotis herbacea** L., Sp. Pl. ***1***:102, 1753; BACKER & BAKH., Fl. Java ***2***:286, 1965.—*Oldenlandia herbacea* (L.) ROXB., Hort. Beng. 11, 1814; CRAIB, Fl. Siam. Enum. ***2***:55, 1932.

Oldenlandia heinii G. DON, Gen. Syst. ***3***:531, 1834; HOOK. f., Fl. Brit. Ind. ***3***:65, 1880; KING & GAMBLE in Jour. As. Soc. Beng. ***72*** (2):169, 1903; PITARD in LECOMTE, Fl. Gén. Indo-Chine ***3***:148, fig. 14, 1922; RIDLEY, Fl. Mal. Pen. ***2***:54, 1923.

Loei: Muang Loei, *Ploenchit 1338* (BKF). Nakhon Rachasima: Sikhiu, *Smitinand 4454* (BKF). Puket: Lem La, *Kerr 17394* (BK).

In Northwest, East, and Peninsular Thailand, at lower elevations.

Distr. Tropical Asia and Africa.

43. **Hedyotis horneriana** (MIQ.) FUKUOKA comb. nov.—*Oldenlandia horneriana* MIQ., Fl. Ind. Bat. ***2***:190, 1857; CRAIB, Fl. Siam. Enum. ***2***:56, 1932.

Chumphon: Chumphon, *Kanthachai 1094*; Bang Son, *Kerr 11335* (BK). Surat Thani: Kanchanadit, *Kerr 13090* (BK). Phatthalung: Sak, *Kerr 19251* (BK).

In North and Peninsular Thailand.

Distr. Sumatra.

The following species are listed by CRAIB, but are excluded here, as they are represented only by a limited number of specimens and I can not give here any conclusive remarks.

44. **Hedyotis andamanica** KURZ in Jour. As. Soc. Beng. ***41*** (2):311, 1872; HOOK. f., Fl. Brit. Ind. ***3***:64, 1880; CRAIB, Fl. Siam. Enum. ***2***:36, 1932.

45. **Hedyotis betongensis** GEDDES in Kew Bull. ***1931***:216; CRAIB, Fl. Siam. Enum. ***2***:36, 1932.

46. **Hedyotis cytisoides** CRAIB in Kew Bull. ***1931***:217 & Fl. Siam. Enum. ***2***:39, 1932.

Only the type specimen, *Kerr 9709*, is preserved in BK, but somewhat damaged by insects. CRAIB compared *H. cytisoides* with *H. praecox* of Indochina and *H. tetrangularis*. According to him, it differs from the former in its taller glabrous stems when mature and

in the larger calyx-lobes, and from the latter in its puberulous ovary and in the stems which branch copiously on the upper parts.

47. **Hedyotis garrettii** CRAIB in Kew Bull. ***1931***:220 & Fl. Siam. Enum. ***2***:41, 1932.

48. **Hedyotis globiceps** RIDLEY, Fl. Mal. Pen. ***2***:47, 1923; CRAIB, Fl. Siam. Enum. ***2***:41, 1932.

CRAIB suggested that *H. globiceps* and *H. prainiana* seem to be the same.

49. **Hedyotis lychnidifolia** CRAIB in Kew Bull. ***1931***:276 & Fl. Siam. Enum. ***2***:43, 1932.

This is similar to *H. tetrangularis* in habit, but the former differs from the latter in its puberulous ovary and hairy whole plant. CRAIB's species may better be placed as a variety of *H. tetrangularis*.

50. **Hedyotis nitida** WIGHT et ARN., Prodr. Fl. Ind. Or. ***1***:412, 1834; CRAIB, Fl. Siam. Enum. ***2***:41, 1932.

Our species is similar to *H. verticillata,* from which it differs in the sparsely hispid upper leaf surfaces.

51. **Hedyotis punicea** CRAIB in Kew Bull. ***1931***:277 & Fl. Siam. Enum. ***2***:46, 1932.

H. punicea is similar to *H. tetrangularis* in habit, but differs in the ovate and shorter leaves, 5–12 mm long, 2–4.5 mm wide, in its smaller height, less than 20 cm, and in the puberulous or shortly pubescent ovaries. *H. punicea is* rather doubtfuly to be consider as a distinct species.

52. **Hedyotis sessilifolia** GEDDES in Kew Bull. ***1928***:241; CRAIB, Fl. Siam. Enum. ***2***:47, 1932.

53. **Hedyotis stelligera** RIDLEY, in Jour. Str. Br. Roy. As. Soc. ***59***:109, 1911; CRAIB, Fl. Siam. Enum. ***2***:48, 1932.

54. **Oldenlandia comata** CRAIB in Kew Bull. ***1931***:441 & Fl. Siam. Enum. ***2***:53, 1932.

The capsule of this species is similar to that of *H. biflora*, but the habit is like that of *H. dichotoma*.

55. **Oldenlandia lanceolata** CRAIB in Kew Bull. ***1931***:442 & Fl. Siam. Enum. ***2***:56, 1932.

Our species is similar to *H. comata* in the features of the capsule, the longer calyx-lobes, and the habit, but it differs from the latter in the not rigid leaves, in the longer pedicels, in the shorter corollas, and in other characters.

56. **Hedyotis pumila** L. f., Suppl. Sp. Pl. 119, 1781.—*Oldenlandia pumila* (L. f.) DC., Prodr. ***4***:425, 1830; CRAIB, Fl. Siam. Enum. ***2***:58, 1932.