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Kyoto University
Contributions to the Flora of Southeast Asia

III. Hedyotis (Rubiaceae) of Thailand

by

Nobuyuki FUKUOKA*

Our knowledge of the genus Hedyotis still remains obscure. Its circumscription varies with each author. J. D. Hooker¹, Craib² and others recognize both Oldenlandia and Hedyotis as genera, but Schumann³, Pitard⁴, and others united them into a single genus. Merrill & Metcalfe⁵ followed the latter course and recognized only Hedyotis, after careful comparison of the species of Hedyotis and Oldenlandia originally described by Linnaeus⁶. 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

* 福岡誠行, Shoei Junior College, Ikuta-ku, Kobe, Japan.
1) J. D. Hooker, in his Flora of British India 3:49-71, 1860, suggested that there were intermediate forms between Hedyotis and Oldenlandia, such as O. wightii and Hedyotis Sect. Scleromitrion.
3) In Engler & Prantle, Pflanzenfamilien 4 (4):24-26, 1891.
6) Species Plantarum. 2, 1753.
described by CRAIB and GEDDES are either reduced to varietal rank or are found syn­nomous 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. ovalifolia.*
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..........
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. gracilipes*.

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

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. \textit{H. viarum}.

25B. Corollas less than 2.5 mm long; main axil ending in cyme, but axillary branches not so extending, less than 1/3 of the whole length of herb; herb erect or dwarf.................................32. \textit{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. \textit{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 .......................................................................................30.

28A. Cymes shorter than leaf; length of corolla less than 2 times of that of ovary.................................................................39. \textit{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 scarcely widening upwards, less than 1 mm in diameter; anthers inserted........................................42. \textit{H. herbacea}.

29B. Corollas campanular, gradually widening upwards, more than 1 mm in diameter; anthers slightly exserted.........................43. \textit{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. \textit{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. \textit{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. \textit{H. tenelliflora}.

33B. Herb erect; cymes peduncled or not; leaves linear to linear-lanceolate, becoming smaller upwards, largest one 4–9 cm long
31B. Capsules globose, ellipsoidal, tubinate or lenticular
34A. Cymes scarcely peduncled
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
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
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
38B. Stipules with spiny lobes; capsules more than 0.8 mm long
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
39B. Capsules scabrous; stems and leaves scabrous, with pilose hairs or rarely glabrous
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
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


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.


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.


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.


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.


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);

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

Distr. Assam.


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.


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

Distr. Known only from the type locality.


Rare in East Thailand and common in peninsular Thailand, in open places or in
light forest, at less than 1000 m alt.


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

Distr. Malaya.


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*.


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


Throughout Thailand, up to 800 m alt.
Distr. Burma and Cambodia.


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.


Chiang Rai: along the highway between Chiang Rai and Chiang Khong, T 11201.

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.


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)


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 herbeaceous, 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.


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


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 trifid 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*.


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.


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.


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


19. **Hedyotis coronaria** (Kurz) CRAIB, Fl. Siam. Enum. 2:38, 1932.—


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


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


Chiang Rai: higher elevation of Doi Tung, T11072. Chiang Mai: Chiang Dao, Khanthachai 159 (BFK); Me Chern, 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.


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. Twyman, 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.


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

**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.


Throughout Thailand.

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


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

In Peninsular Thailand.

Distr. North Malaya.


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.


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.


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 cannot recognize any differences in the floral characters between H. nantoensis and H. hedyotidea.


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 calyxlobes are slightly recurved and its flowers are pedicelled.


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 capitulate 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.


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.


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

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


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*.


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*.

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)

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, T1).

This is allied to **Oldenlandia krewanhensis** PIERRÉ 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.


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
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
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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.


In Southwest, Southeast and Peninsular Thailand.

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.


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.

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

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

Distr. India.


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.


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.


Endemic to Northeast and East Thailand.


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.


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, Polynesia, China, Formosa, and Japan.


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

Distr. India to Japan, Indochina, and Malaysia.


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

Distr. Tropical and subtropical regions of the World.


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.


In Northwest, East, and Peninsular Thailand, at lower elevations. Distr. Tropical Asia and Africa.


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.


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.


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

   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.

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

   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 doubtfully to be consider as a distinct species.


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

   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.