

35. HEDYOTIS Linnaeus, Sp. Pl. 1: 101. 1753, nom. cons.

耳草属 er cao shu

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Diplophragma (Wight & Arnott) Meisner; *Exallage* Bremekamp; *Gonothecha* Blume ex Candolle (1830), not Rafinesque (1818); *Hedyotis* sect. *Diplophragma* Wight & Arnott; *Metabolos* Blume; *Oldenlandia* Linnaeus; *Thecagonum* Babu.

Herbs, subshrubs, or shrubs, annual or perennial, procumbent to erect or climbing, unarmed. Raphides present. Leaves opposite [or rarely whorled], sometimes clustered at ends of stems, without domatia; secondary venation rarely triplinerved or palmate; stipules persistent, interpetiolar, fused to petiole bases, or united around stem, triangular to truncate, entire or ciliate to lacinate, erose, 1- to several lobed and/or -setose. Inflorescences terminal, pseudoaxillary, and/or axillary, few to many flowered and fasciculate, cymose, paniculate, capitate, or glomerulate or reduced to 1 flower, sessile or pedunculate, bracteate or bracts reduced. Flowers pedicellate or sessile, bisexual and monomorphic or distylous [to unisexual on dioecious plants]. Calyx limb shallowly to deeply (2–)4-lobed (or 5-lobed, *Hedyotis hainanensis*). Corolla white, pink, purple, or blue, tubular, funnelform, salverform, rotate, or urceolate, variously glabrous or pubescent inside; lobes (2–)4(or 5, *H. hainanensis*), valvate in bud. Stamens 4(or 5, *H. hainanensis*), inserted in corolla tube or throat, included or exerted; filaments developed to reduced; anthers dorsifixed often near base. Ovary 2-celled, ovules few to numerous or rarely 1 in each cell on axile placentas; stigma 2-lobed with lobes linear to clavate or rarely undivided, included or exerted. Fruit indehiscent, schizocarpous, or capsular, generally subglobose to ovoid or dicocous, crustaceous to membranous or leathery, when schizocarpous splitting into 2 mericarps, when capsular splitting partially to entirely septically and/or loculicidally, subsequently sometimes splitting other way, apically flattened or with short to well-developed beak (i.e., disk area inside calyx limb), sometimes dehiscent primarily through beak, with calyx limb persistent; seeds few to numerous, small, angular or plano-convex; testa smooth, reticulate, or otherwise variously ornamented; endosperm fleshy; radicle clavate or terete.

About 500 species: tropical and subtropical regions worldwide, most in Africa and Asia, a few in warm temperate regions; 67 species (38 endemic) in China.

This is a very problematic genus or group of genera. Neither the overall identity and limits of this lineage—distributed throughout the tropics and warm temperate regions of the world, with numerous species with often reduced morphology—nor the evolutionary patterns within it are at all understood or delineated. Widely differing taxonomies and species-level characters have long been used in different regions and floras. It is generally accepted now that *Hedyotis* is closely related to or at least in some cases perhaps includes *Houstonia* Linnaeus, *Kadua* Chamisso & Schlechtendal, *Kohautia* Chamisso & Schlechtendal, *Neanotis*, *Oldenlandia*, and a number of smaller segregate genera including *Exallage*, *Oldenlandiopsis* Terrell & W. H. Lewis, *Pentodon* Hochstetter, *Stenaria* Terrell, *Stenotis* Terrell, and *Thecagonum*. The situation is far from resolution or even general consensus. This genus is treated broadly here, as done also by many recent authors working our flora region (Fukuoka, S. E. Asia Stud. 8(3): 305–336. 1970; W. C. Ko in FRPS 71(1): 26–77. 1999; Wang & Zhao, J. Trop. Subtrop. Bot. 9(3): 219–228. 2001; Dutta & Deb, Taxon. Rev. *Hedyotis*. 2004). Recently, some authors have separated *Oldenlandia*; but, as outlined by Terrell and Robinson (Taxon 52: 775–782. 2003), recent molecular studies have concluded that the circumscriptions and relationships of these two groups are less well understood than had been thought, and these groups are probably paraphyletic and/or polyphyletic with relation to each other as well as several other genera.

The taxonomy of *Hedyotis* is further complicated by nomenclatural issues, in particular the designation of the type species. Dutta and Deb (loc. cit. 2004 – a late publication of a 1991 manuscript), following majority opinion of the time, considered *H. auricularia* as the type of *Hedyotis*; however, subsequently, *H. fruticosa* Linnaeus instead was successfully proposed as the conserved type of the genus (Nicolson, Taxon 41: 564. 1992; see *Vienna Code*, App. III, p. 343). The typification of *Hedyotis* and corresponding generic names were reviewed in detail by Terrell and Robinson (loc. cit.).

Terrell and Robinson (loc. cit.) also summarized the infrageneric classification and species groups of *Hedyotis*, including those accepted by W. C. Ko (loc. cit.), but without noting a few differences between Ko's classifications and theirs, nor the use of some incorrect sectional names by Ko (e.g., *H.* sect. "*Euoldenlandia*" would have been called *H.* sect. "*Oldenlandia*" if it had been published, but it was not; Ko's *H.* sect. "*Diplophragma*" included the species that is now the type of the genus, thus this should have been called *H.* sect. *Hedyotis*, while this particular section was synonymized by Terrell & Robinson). The genus circumscription as well as the infrageneric classification of *Hedyotis* are very far from understood at present (Groeninckx et al., Scripta Bot. Belg. 44: 33. 2008).

The information available about *Hedyotis bodinieri* is inadequate to include this species in the key. Because of the complexity of this genus or group of genera and the large number of species in China, the descriptions here are more detailed than in some other Rubiaceae genus treatments here. W. C. Ko (loc. cit.) described the fruit of most species of *Hedyotis* as dehiscent into 2 mericarps at maturity, with mericarps vertically dehiscent at ventral part, but these fruit are considered capsules by other authors. In some cases, this description was not entirely accurate because the fruit are actually truly schizocarpous (i.e., with indehiscent mericarps) or primarily loculicidal.

- 1a. Stems pilose, hirsute, tomentose, or villous and sometimes also hirtellous or villosulous, with pubescence sparsely to densely distributed and with some trichomes 1 mm or more.
- 2a. Plants scandent, climbing, or clambering; inflorescences terminal and in uppermost leaf axils, sometimes on very short lateral stems.

- 3a. Inflorescences cymose, corymbiform-rounded; flowers all pedicellate, pedicels 1.5–3 mm 42. *H. obliquinervis*
- 3b. Inflorescences capitate, subcapitate, glomerulate, subglobose, or hemispherical; flowers sessile or subsessile.
- 4a. Heads solitary on peduncles or glomerulate along stem and/or along peduncles 24. *H. dianxiensis*
- 4b. Heads several in paniculate groups on each or at least most peduncles 13. *H. capitellata*
- 2b. Plants prostrate on ground, erect, or climbing; inflorescences terminal and/or axillary along middle or lower stem nodes.
- 5a. Stipules entire; inflorescences and flowers sessile; Hainan, Taiwan.
- 6a. Annual herbs to 30 cm tall; calyx lobes ca. 1.5 mm; Taiwan 11. *H. butensis*
- 6b. Perennial subshrubs or shrubs to 1 m tall; calyx lobes 2.5–3 mm; Hainan 64. *H. wuzhishanensis*
- 5b. Stipules erose or 2–5-lobed or -setose; inflorescences and flowers sessile to pedicellate and/or pedunculate; mainland and Hainan.
- 7a. Low annual herbs, prostrate to weakly erect; leaves 6–10 mm wide; flowers few or solitary, subsessile to pedicellate; Hainan 58. *H. trinervia*
- 7b. Annual or perennial herbs or subshrubs, generally erect and robust; leaves 5–45 mm wide; flowers several to numerous, sessile to pedicellate in pedunculate heads or cymes.
- 8a. Flowers subsessile to pedicellate; glomerules or cymes subsessile to pedunculate; calyx lobes 1–1.2 mm 34. *H. lineata*
- 8b. Flowers sessile or subsessile; cymes or heads pedunculate; calyx lobes 0.3–1 mm 62. *H. vestita*
- 1b. Stems glabrous to puberulent, strigillose, hispidulous, strigose, hirtellous, or pilosulous and sometimes hirsute or pilose in small scattered patches or lines, with trichomes generally all less than 1 mm.
- 9a. Inflorescences mostly or all axillary or pseudoaxillary; stem apices generally vegetative.
- 10a. Inflorescences capitate, cymose, paniculate, fasciculate, or glomerulate, subsessile or on developed peduncles.
- 11a. Bracts lanceolate, ovate, elliptic, or broadly triangular, 1–12 mm, partly to fully enclosing flowers; flowers sessile to shortly pedicellate in heads or congested or somewhat lax cymes, or on pedicels to 1.5 mm; stipules triangular, 4–13 mm.
- 12a. Inflorescences congested-cymose to shortly paniculate or subglomerulate, sessile to pedunculate, peduncle to 2 cm; leaves 15–25 × 3–6 cm 15. *H. cathayana*
- 12b. Inflorescences capitate or glomerulate to laxly cymose, subsessile to pedunculate, peduncle to 8 cm; leaves 12–17 × 0.5–4 cm.
- 13a. Inflorescences capitate or glomerulate, on well-developed peduncles 2.5–7 cm 9. *H. bracteosa*
- 13b. Inflorescences cymose, branched, on peduncles 0.5–8 cm.
- 14a. Stipules 1.5–5 mm; calyx lobes 0.8–1.2 mm; corolla tube 2.2–3.5 mm 1. *H. acutangula*
- 14b. Stipules 8–13 mm; calyx lobes 2–3 mm; corolla tube 4.5–5 mm 20. *H. communis*
- 11b. Bracts reduced, absent, or narrow to triangular, 1–5 mm, not enclosing flowers; flowers separately pedicellate and/or pedunculate, solitary or in lax cymes; pedicels 1–30 mm; stipules reduced or triangular to truncate, 0.3–3 mm.
- 15a. Flowers several (i.e., ca. 5) to many in terminal and axillary lax cymes or panicles, separately pedicellate with pedicels 1–15 mm; leaves 7–35 mm wide.
- 16a. Pedicels 4–15 mm; stipules triangular, ovate, or subtruncate, entire or glandular-serrulate or glandular-erose 55. *H. tenuipes*
- 16b. Pedicels 1–3 mm; stipules entire, 4–6-lobed, -setose, and/or ciliolate.
- 17a. Stipules 4–6-lobed or -setose 3. *H. assimilis*
- 17b. Stipules entire or ciliolate 35. *H. loganioides*
- 15b. Flowers 1–5 per axil, all axillary on separate peduncles or in pedunculate cymes, pedicels and peduncles 1–30 mm; leaves 1–5 mm wide.
- 18a. Capsule with developed beak 1–1.5 mm, conical, longer than calyx lobes; stipules reduced, sheath portion reduced to a line or up to 0.3 mm; corolla tube 2–3 mm and lobes 0.5–1 mm 30. *H. herbacea*
- 18b. Capsule flat on top or with beak rounded to broadly angled, up to 0.5 mm, shorter than or equal to calyx lobes; stipules with sheath tubular to triangular, 0.5–2 mm; corolla tube 0.8–2.5 mm and lobes 0.8–1.5 mm.
- 19a. Stems quadrate to flattened with angles thickened to winged and usually pubescent to scaberulous; flowers 1–5 per peduncle, all pedicellate; stigmas and anthers included 22. *H. corymbosa*
- 19b. Stems terete to flattened or 4-angled when young, glabrous to rather evenly scaberulous or pubescent; flowers 1 or 2 in each stem axil, subsessile to pedicellate; stigmas and anthers exerted.
- 20a. Stems glabrous; peduncles and/or pedicels to 3 mm in flower, to 8 mm in fruit 8. *H. brachypoda*
- 20b. Stems puberulent and/or scaberulous; peduncles 4–20 mm 25. *H. diffusa*

- 10b. Inflorescences sessile or subsessile, unbranched, i.e., glomerulate, capitate, congested-cymose, subcapitate, shortly fasciculate, or 1-flowered.
- 21a. Stipules at flowering nodes with sheath 3–30 mm and these and/or leaf bases partially to fully enclosing and mostly hiding inflorescences.
- 22a. Leaves 15–30 × 5–10 cm; stipules narrowly triangular, 8–30 mm; calyx lobes 6–8 mm; corolla tube 14–16 mm; Hainan 23. *H. cryptantha*
- 22b. Leaves 2.5–12 × 1–4 cm; stipules broadly triangular to obovate, 3–10 mm; calyx lobes 1.5–6 mm; corolla tube 1.8–12 mm; mainland and Hainan.
- 23a. Calyx lobes 1.5–3 mm; corolla tube 1.8–2 mm 33. *H. lianshanensis*
- 23b. Calyx lobes 2–6 mm; corolla tube 6–12 mm.
- 24a. Leaves rounded to obtuse at base and sessile or subsessile; inflorescence terminal and pseudoaxillary; calyx lobes widest above middle 40. *H. merguensis*
- 24b. Leaves rounded to acute at base and petiolate, petioles 3–18 mm; inflorescences axillary; calyx lobes widest at or below middle 47. *H. platystipula*
- 21b. Stipules with sheath 4 mm or shorter (measured from line between bases of petioles), neither these nor leaf bases enclosing inflorescence.
- 25a. Leaves linear, narrowly elliptic, narrowly spatulate, linear-lanceolate, or narrowly elliptic-oblong, 0.8–13 mm wide, with margins mostly straight, with secondary veins not visible.
- 26a. Fruit compressed globose or subglobose; calyx lobes 1–1.5 mm; flowers solitary or 2 per node, pseudoaxillary 8. *H. brachypoda*
- 26b. Fruit ovoid to lanceoloid; calyx lobes 1–2.5 mm; flowers 1 to several per node, axillary, pseudoaxillary, and/or sometimes terminal.
- 27a. Inflorescences terminal and pseudoaxillary on short axillary stems; leaves linear to narrowly spatulate, 0.8–2 mm wide 46. *H. pinifolia*
- 27b. Inflorescences all axillary; leaves narrowly elliptic to linear, 1.5–13 mm wide.
- 28a. Calyx glabrous; flowers 1–3 per node; leaves 1.5–4 mm wide 54. *H. tenelliflora*
- 28b. Calyx densely hispidulous; flowers several per node; leaves 3–13 mm wide 61. *H. verticillata*
- 25b. Leaves narrowly to broadly elliptic, lanceolate, ovate, or elliptic-oblong, 4–45 mm wide, with margins curved, with secondary veins visible or not.
- 29a. Plants prostrate, regularly rooting at nodes; leaves 0.8–3.2 × 0.5–1.4 cm; flowers few, subsessile to pedicellate 19. *H. chrysotricha*
- 29b. Plants erect to procumbent, clambering, or prostrate, rooting only at or near base; leaves 1.2–12 × 0.3–4.5 cm; flowers few to numerous, sessile to pedicellate.
- 30a. Calyx lobes 1.5–4 mm.
- 31a. Fruit indehiscent; inflorescences all produced at nodes below apex; corolla 3–4.5 mm 33. *H. lianshanensis*
- 31b. Fruit dehiscent septicidally then loculicidally; inflorescences terminal and axillary at uppermost stem nodes; corolla 4.5–5.5 mm 59. *H. uncinella*
- 30b. Calyx lobes 0.8–1.5 mm.
- 32a. Leaves 1.2–4.5 cm wide, with secondary veins hardly or not visible; inflorescences axillary at upper nodes and often also terminal; corolla 3–4.2 mm 48. *H. prostrata*
- 32b. Leaves 0.3–3 cm wide, with secondary veins clearly evident; inflorescences at apex and/or nodes below apex; corolla 1–2.5 mm.
- 33a. Leaves subsessile to petiolate, 0.4–3 cm wide; stipules densely setose; inflorescences at nodes well below stem apex; corolla lobes 0.5–1 mm; widespread 4. *H. auricularia*
- 33b. Leaves sessile, 0.3–1 cm wide; stipules entire; inflorescences terminal and at uppermost nodes; corolla lobes ca. 0.2 mm; N Taiwan 11. *H. butensis*
- 9b. Inflorescences terminal, or terminal and in uppermost leaf axils.
- 34a. Flowers 5-merous; calyx lobes 3–3.5 mm 28. *H. hainanensis*
- 34b. Flowers 4-merous; calyx lobes 0.1–35 mm.
- 35a. Leaves linear, linear-lanceolate, narrowly elliptic, narrowly lanceolate, narrowly spatulate, or narrowly elliptic-oblong, consistently 0.8–5.5 mm wide.
- 36a. Flowers 2–12 in lax cymes; pedicels 3–20 mm 32. *H. koana*
- 36b. Flowers 3 to numerous in heads, fascicles, or congested to lax cymes; flowers sessile or on pedicels to 3 mm.
- 37a. Inflorescences with axes regularly dichotomous, 4–13 cm, with numerous flowers 57. *H. tetragularis*
- 37b. Inflorescences up to 3 cm, capitate to cymose, with several flowers.
- 38a. Flowers on pedicels 0.5–1.2 mm; corolla tube 1.5–2.2 mm 10. *H. brevicalyx*
- 38b. Flowers sessile or on pedicels to 1 mm; corolla tube 3–4.2 mm 46. *H. pinifolia*

- 35b. Leaves variously shaped, linear to elliptic, lanceolate, elliptic-oblong, or ovate, 3–120 mm wide with at least some leaves more than 5 mm wide.
- 39a. Inflorescences 1-flowered or capitate, subcapitate, fascicled, or congested-cymose, with flowers few to numerous and sessile to subsessile or shortly pedicellate, in heads or congested to lax cymes.
- 40a. Flowers solitary or 2–5 and fasciculate to very shortly cymose, sessile to shortly pedicellate; leaves 0.8–7 × 0.5–3.5 cm.
- 41a. Calyx lobes ca. 4 mm, longer than or ± as long as corolla tube 43. *H. ovata*
- 41b. Calyx lobes 3–3.5 mm, much shorter than corolla tube 50. *H. pulcherrima*
- 40b. Flowers 4 to numerous, sessile to shortly pedicellate in heads, congested cymes, or umbelliform cymes; leaves 1–12 × 0.6–4.5 cm.
- 42a. Inflorescences with peduncles, with 1 to several heads, with subtending bracts developed to leaflike or reduced.
- 43a. Calyx lobes 3–6 mm.
- 44a. Leaves 4–5.5 × 0.6–2.6 cm 65. *H. xanthochroa*
- 44b. Leaves (at least well-developed ones) 8–12 × 3–4.5 cm 66. *H. yangchunensis*
- 43b. Calyx lobes 0.3–4 mm.
- 45a. Corolla tube ca. 7 mm; inflorescence with 1 congested-cymose head (as far as known); flowers sessile 63. *H. wangii*
- 45b. Corolla tube 1–3 mm; inflorescence (at least usually) with 2–15 heads; flowers sessile or subsessile.
- 46a. Plants erect; corolla lobes shorter than tube, tube ca. 3 mm and lobes ca. 1.3 mm 14. *H. capituligera*
- 46b. Plants clambering to climbing; corolla lobes longer than tube, tube 1–2 mm and lobes 3–5 mm.
- 47a. Stems and leaves glabrescent or hirtellous, pilosulous, hispidulous, or tomentulose; calyx limb lobed for 1/3–3/4 13. *H. capitellata*
- 47b. Stems and leaves densely tomentulose or villous to glabrous; calyx limb deeply lobed ... 24. *H. dianxiensis*
- 42b. Inflorescences sessile or subsessile, in 1 head subtended by leaves or well developed to leaflike bracts.
- 48a. Calyx lobes ca. 35 mm; leaves 4–12 cm wide 67. *H. yazhouensis*
- 48b. Calyx lobes 1–5.5 mm; leaves 0.4–6 cm wide.
- 49a. Leaves with petioles 10–15 mm 5. *H. baotingensis*
- 49b. Leaves sessile or with petioles to 10 mm, at least some shorter than 10 mm.
- 50a. Calyx lobes 1–1.2 mm; corolla tube 2–3 mm 48. *H. prostrata*
- 50b. Calyx lobes 2–5.5 mm; corolla tube 3–12 mm.
- 51a. Corolla tube 9–12 mm 40. *H. merguensis*
- 51b. Corolla tube 3–6.5 mm.
- 52a. Stipules acute or aristate.
- 53a. Leaves 0.4–1.2 cm wide, with petioles to 3 mm 37. *H. longipetala*
- 53b. Leaves 1.4–4.5 cm wide, with petioles to 10 mm.
- 54a. Stems glabrous; leaves 7–12 cm; corolla tube 4–5 mm 45. *H. paridifolia*
- 54b. Stems densely villous to hirtellous; leaves 2.5–6.2 cm; corolla tube 5.5–6.5 mm 64. *H. wuzhishanensis*
- 52b. Stipules lacinate or with several lobes or bristles.
- 55a. Leaves puberulent to glabrous adaxially; flowers sessile or subsessile; corolla lobes 1.5–2 mm; fruit 1.8–2 mm in diam. 59. *H. uncinella*
- 55b. Leaves glabrous or glabrescent adaxially; flowers sessile or on pedicels to 2 mm; corolla lobes 2–2.5 mm; fruit 2–2.5 mm in diam.
- 56a. Corolla tube ca. 5 mm; fruit ca. 2 mm in diam. 17. *H. cheniana*
- 56b. Corolla tube ca. 3.5 mm; fruit ca. 2.5 mm in diam. 56. *H. terminaliflora*
- 39b. Inflorescences branched, cymose to paniculate, with flowers few to numerous, at least some of them regularly pedicellate (or separated on well-developed inflorescence axes).
- 57a. Plants low annuals or perennials, vegetative part (and usually entire plant) mostly up to 15 cm tall, sometimes to 40 cm tall, often weak or scapose, often quite succulent; flowers few to numerous in small to diffuse cymes.
- 58a. Leaves usually clustered at top of stem (i.e., at base of inflorescence) due to reduced internodes and appearing verticillate; stems densely pilosulous, puberulent, or villosulous and often glandular on uppermost nodes 44. *H. ovatifolia*
- 58b. Leaves generally distributed along stem in pairs, or entire stem with reduced internodes; stems

- glabrous to variously pubescent, not glandular.
- 59a. Hypanthium and fruit 4-winged, wings usually extending downward along pedicel 49. *H. pterita*
- 59b. Hypanthium and fruit smooth or with low ridges, or hypanthium sometimes narrowly winged in flower but becoming smooth as fruit develops.
- 60a. Calyx lobes ovate, relatively broad, sometimes with evident venation 31. *H. hermanniana*
- 60b. Calyx lobes triangular to lanceolate, generally narrow, not veined.
- 61a. Calyx limb lobed essentially to base, with tubular portion reduced or just a line; fruit with beak mostly as long as or longer than calyx lobes; plants not or somewhat succulent, weedy in various habitats 6. *H. biflora*
- 61b. Calyx limb with tube developed, lobed for 1/2–2/3, remaining developed and connected to lobes in fruit; fruit with beak much shorter than calyx lobes; plants succulent, mostly on seashores and rocks at low elevations 53. *H. strigulosa*
- 57b. Plants small to large, apparently perennials, vegetative portion usually at least 20 cm tall, robust, erect to clambering or climbing, usually not scapose, not or sometimes slightly succulent; flowers several to numerous in congested to expanded cymes or panicles.
- 62a. Plants clambering, scandent, lianescent, or climbing.
- 63a. Leaves with secondary veins plane and generally not evident abaxially 51. *H. scandens*
- 63b. Leaves with secondary veins plane to prominulous and evident abaxially.
- 64a. Flowers pedicellate in dichotomous cymules, with pedicels 1–3.5 mm; axes and pedicels of inflorescence generally spreading at 60°–90° 2. *H. ampliflora*
- 64b. Flowers sessile to subsessile or pedicellate in congested to subcapitate cymules, with pedicels to 2 mm; axes and pedicels of inflorescence generally ascending, at angles less than 60°.
- 65a. Stems densely villous and/or tomentulose; flowers in distinct, discrete heads; calyx lobes generally erect 24. *H. dianxiensis*
- 65b. Stems glabrous to papillose, pilosulous, or velutinous-strigillose; inflorescence at least partly cymose; calyx lobes spreading to usually reflexed 29. *H. hedyotidea*
- 62b. Plants erect.
- 66a. Flowers all pedicellate, pedicels 4–15 mm.
- 67a. Calyx lobes 0.1–0.3 mm; corolla 1–1.5 mm 18. *H. chereevensis*
- 67b. Calyx lobes 1–1.5 mm; corolla 4.5–7 mm 55. *H. tenuipes*
- 66b. Flowers sessile to subsessile, mixed sessile and pedicellate, or all pedicellate, pedicels to 5 mm but most less than 4 mm.
- 68a. Inflorescence axes and pedicels spreading at 90° or more; leaves usually borne at only 2 or 3 stem nodes 26. *H. effusa*
- 68b. Inflorescence axes and pedicels ascending to slightly spreading, generally at angles less than 60° (or frequently to 90° or more in *H. vachellii* in fruit); leaves borne at few to numerous stem nodes.
- 69a. Stipules setose, lobed, or laciniate, with 2 to several narrow lobes, awns, or bristles (at least on lower nodes).
- 70a. Corolla tube longer than corolla lobes; inflorescences with several subcapitate to congested-cymose heads or cymules.
- 71a. Flowers sessile to subsessile 14. *H. capituligera*
- 71b. Flowers sessile and pedicellate, pedicels to 4 mm 38. *H. matthewii*
- 70b. Corolla lobes longer than corolla tube; inflorescences with few- to many-flowered cymes; pedicels 1–5 mm.
- 72a. Stipules 4–6-lobed or -setose 3. *H. assimilis*
- 72b. Stipules glandular-serrulate to 3-lobed or -setose 39. *H. mellii*
- 69b. Stipules entire or sometimes with a terminal awn and/or serrate to serrulate-denticulate.
- 73a. Leaves with secondary veins prominulous and evident on abaxial surface 39. *H. mellii*
- 73b. Leaves with secondary veins plane and generally not evident on abaxial surface.
- 74a. Stems sharply angled to winged, at least on lower internodes; leaves sessile, often clasping at base 1. *H. acutangula*
- 74b. Stems rounded to flattened or angled, angles generally not sharp; leaves petiolate to subsessile, at base narrow to rounded but usually not clasping.
- 75a. Calyx lobes ca. 4 mm 43. *H. ovata*
- 75b. Calyx lobes 0.3–2.5 mm.
- 76a. Plants scapose, with leaves clustered at base; leaves 5–9 cm wide 52. *H. shenzhenensis*

- 76b. Plants with leaves distributed along stem; leaves 0.4–3.5 cm wide.
- 77a. Corolla tube 1.5–2.5 mm; calyx lobes 0.5–1.2 mm; inflorescence axes often becoming spiciform and/or scorpioid.
- 78a. Calyx lobes 0.8–1.2 mm; leaves with secondary veins 4–6 pairs 21. *H. consanguinea*
- 78b. Calyx lobes ca. 0.5 mm; leaves with secondary veins ca. 3 pairs 36. *H. longiexserta*
- 77b. Corolla tube 2.5–10 mm; calyx lobes 1–2.5 mm; inflorescence axes generally dichasial.
- 79a. Corolla with tube 4–10 mm, lobes 1/2 as long as tube or shorter.
- 80a. Corolla white or pink, with tube markedly funnellform 16. *H. caudatifolia*
- 80b. Corolla pink to purple, with tube cylindrical to slightly funnellform.
- 81a. Corolla tube ca. 6 mm 27. *H. exserta*
- 81b. Corolla tube 7–10 mm 41. *H. minutopuberula*
- 79b. Corolla with tube 2.5–4 mm, lobes shorter than tube but more than 1/2 as long as tube.
- 82a. Pedicels to 4 mm; corolla tube 3.5–4 mm and lobes 2–3 mm 38. *H. matthewii*
- 82b. Pedicels to 1.5 mm; corolla tube 2.5–3.5 mm and lobes 2–2.2 mm.
- 83a. Inflorescences narrowly cylindrical to pyramidal, axes ascending; fruit 2–3 mm in diam. 12. *H. cantoniensis*
- 83b. Inflorescences broadly pyramidal to rounded, axes ascending to spreading at 90° or more; fruit ca. 1.8 mm in diam. 60. *H. vachellii*

1. *Hedyotis acutangula* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 171. 1852.

金草 jin cao

Oldenlandia acutangula (Champion ex Benth) Kuntze.

Herbs or subshrubs, apparently biennial or perennial, erect, 25–60 cm tall; stems sometimes slightly constricted at nodes, 4-angled to 4-winged, wings to 1.5 mm wide. Leaves sessile or subsessile; blade drying stiffly papery to leathery, ovate-lanceolate, lanceolate, elliptic, or lanceolate-elliptic, 2–12 × 0.5–2.5 cm, glabrous, base cuneate to rounded, margins thickened, often inrolled, sometimes glandular-serrulate, apex acute or shortly acuminate; secondary veins indistinct; stipules fused to petiole bases, ovate or triangular, 1.5–5 mm, glabrous, margins often becoming revolute, entire or glandular-serrulate, apex acute to acuminate. Inflorescences terminal, in axils of uppermost leaves, and occasionally also axillary or pseudoaxillary at lower nodes, paniculate or corymbose, 3–20 cm, many flowered, glabrous, pedunculate; peduncle 2–8 cm; axes dichasial, sharply 4-angled to thinly 4-winged; bracts triangular to lanceolate and 0.3–5 mm, or leaflike and larger. Flowers sessile, distylous. Calyx glabrous; hypanthium portion turbinate to ellipsoid, 0.8–1 mm; limb lobed nearly to base; lobes ovate, triangular, or lanceolate, 0.8–1.2 mm. Corolla white to pink, funnellform, outside glabrous; tube 2.2–3.5 mm, inside tomentose above middle; lobes ovate-lanceolate, 2–3 mm. Anthers included or exserted, ca. 1 mm. Stigma included or exserted, 0.5–1 mm. Fruit capsular, obovoid to ellipsoid, 2–2.5 × 1–1.2 mm, glabrous, leathery, apically flat or with beak to 0.3 mm, septicidal and then loculicidal along middle of septum; seeds several, black, suborbicular, angled. Fl. May–Dec, fr. Jun–Dec.

Hill slopes, open fields; near sea level to 600 m. Fujian, Guangdong, Hainan (Wanning) [N Thailand, Vietnam].

Deb and Dutta (Taxon 34: 296–297. 1985) briefly discussed this species and formally synonymized *Hedyotis elegans* Wallich ex Kurz with it; however, they gave no characters or discussion of either species and gave its range as “Burma and Malaysia” even though its type is from Hong Kong, so their conclusions are provisionally not included here.

2. *Hedyotis ampliflora* Hance, J. Bot. 17: 11. 1879.

广花耳草 *guang hua er cao*

Oldenlandia ampliflora (Hance) Kuntze.

Herbs or shrubs, perennial, lianescent, clambering, twining, or scandent, to perhaps 1 m; stems flattened to subterete, smooth to sulcate, densely hirtellous or pilosulous throughout or in lines, to glabrescent. Leaves petiolate; petiole 2–6 mm, densely hirtellous to puberulent; blade drying papery, lanceolate, broadly lanceolate, elliptic, or narrowly elliptic, 2–7 × 0.8–3 cm, adaxially hispidulous or strigillose along midrib to throughout, abaxially hispidulous or hirtellous to glabrous, base cuneate to obtuse, apex acute or shortly acuminate; secondary veins 3 or 4 pairs; stipules fused to petiole bases, densely hirtellous to hispidulous, sheath portion 1–3 mm, truncate to triangular, apex lacerate into 3–5 narrowly triangular to linear bristles or lobes 1–6 mm. Inflorescences terminal and occasionally also in axils of uppermost leaves, compound-cymose, corymbiform, 3–12 cm, several to many flowered, densely to sparsely hirtellous to puberulent, pedunculate; peduncles 1–3.5 cm; axes dichotomous, spreading; bracts triangular, lanceolate, or narrowly elliptic, 1–7 mm; pedicels 1–3.5 mm. Flowers pedicellate, apparently distylous. Calyx glabrous to densely hirtellous; hypanthium portion subglobose or turbinate, 0.8–1 mm; limb lobed for 3/4–4/5; lobes lanceolate to spatulate, 1.2–1.8 mm, acute, usually spreading to reflexed. Corolla white or greenish white, tubular to salverform, outside granular-puberulent; tube ca. 1 mm, barbate in throat; lobes lanceolate to spatulate, 2–2.5 mm, acute. Anthers partially or long exerted, 0.8–1 mm. Stigmas in short-styled form not seen, or exerted and ca. 0.3 mm. Fruit capsular, subglobose to ovoid, sometimes slightly flattened, 2.5–3 × 2–2.5 mm, glabrous to densely hirtellous, cartilaginous to stiffly papery, loculicidal then septicidal across top then tardily along sides, beak conical, ca. 1 mm; seeds numerous, blackish brown, angled. Fl. May–Nov, fr. Oct–Nov.

• Sparse forests or thickets on mountain slopes; 100–400 m. Hainan.

The Kew Rubiaceae checklist (Govaerts et al., World Checkl. Rubiaceae; <http://www.kew.org/wcsp/rubiaceae/>; accessed on May 2007) reports this species also from Vietnam; it is not listed in the Vietnam checklist.

3. *Hedyotis assimilis* Tutcher, Rep. Bot. Dept. Hong Kong 1914: 32. 1915.

清远耳草 *qing yuan er cao*

Oldenlandia assimilis (Tutcher) Chun.

Herbs or subshrubs, erect, branched, 30–40 cm tall; stems quadrangular, scabrous. Petiole ca. 3 mm; leaf blade drying papery, lanceolate, 5–9 × 1.5–2.5 cm, scabrous, base cuneate, apex long acuminate; secondary veins ca. 4 pairs, adaxially impressed; stipules broadly triangular, ca. 3 mm, usually 4–6-lobed or perhaps setose. Inflorescence axillary and terminal, in cymes arranged into panicles, usually shorter than leaves, 6–8-flowered; bracts small, narrow; pedicels 1–3 mm. Flowers pedicellate, with biology unknown. Calyx glabrous; lobes ovate, acute. Corolla white, outside glabrous, inside and on filaments densely bearded; lobes lanceolate, longer than tube, obtuse.

Style exerted, bearded below middle. Fruit capsular, ellipsoid, ca. 3 mm including persistent calyx limb, septicidal then loculicidal through middle of septum; seeds numerous, black, angled. Fl. Apr–May.

• Broad-leaved forests, slopes in ravines. Guangdong (Conghua, Qingyuan).

4. *Hedyotis auricularia* Linnaeus, Sp. Pl. 1: 101. 1753.

耳草 *er cao*

Herbs, perennial, tufted to weak or procumbent, sometimes (var. *auricularia*) to usually (var. *mina*) rooting at lowermost nodes, to 1 m tall or long; stems flattened, 4-angled, or terete becoming angled and/or sulcate, densely hirtellous, hispidulous, strigillose, pilosulous, or puberulent, to sometimes glabrescent (var. *auricularia*), or glabrous except villosulous to pilosulous and sometimes also hirsute to pilose inside grooves (var. *mina*). Leaves subsessile to petiolate; petiole to 7 mm, densely strigillose to pilosulous; blade drying subleathery to papery, ovate, lanceolate, elliptic, or elliptic-oblong, 2.2–9 × 0.6–3 cm (var. *auricularia*) or 1.2–3 × 0.4–1.4 (var. *mina*), adaxially glabrous or puberulent along midrib or scabrous, abaxially glabrous on lamina and densely puberulent to strigillose or hispidulous along principal veins and margins, base acute to obtuse and sometimes shortly decurrent, apex acute or acuminate; secondary veins 4–6 (var. *auricularia*) or 2–4 (var. *mina*) pairs; stipules fused to petiole bases, densely puberulent, strigillose, or pilosulous, sheath 1.5–3.5 mm, truncate to triangular or elliptic, in var. *auricularia* with 3–9 linear or setiform lobes 0.5–5 mm, often glandular at apex, in var. *mina* entire and acute to aristate or sometimes with 2 setose lobes to 2 mm. Inflorescences axillary, glomerulate to congested-cymose, 5–12 mm in diam., several to many flowered (var. *auricularia*) or 2–7-flowered (var. *mina*), puberulent, sessile; bracts lanceolate to stipuliform, 0.3–2 mm; pedicels to 1 (var. *auricularia*) or 3 (var. *mina*) mm. Flowers sessile to pedicellate, distylous. Calyx puberulent (var. *auricularia*) or glabrous (var. *mina*); hypanthium portion obconic, ca. 1 mm; limb lobed essentially to base; lobes lanceolate to triangular, 0.8–1.2 mm, usually ciliate. Corolla white, tubular or tubular-funnelform, outside pilosulous at least on lobes (var. *auricularia*) or glabrous throughout (var. *mina*); tube 1–1.5 mm, barbate in throat; lobes 0.5–1 mm. Anthers narrowly oblong, ca. 1 mm, exerted or included. Stigma ca. 1 mm, exerted or included. Fruit indehiscent, globose to ovoid, 1.2–1.5 mm in diam., sparsely hirtellous, hispidulous, or puberulent (var. *auricularia*), or glabrous (var. *mina*), sometimes with peduncles and/or pedicels elongating, to 2 mm; seeds 4–12, black, foveolate. Fl. and fr. Mar–Dec.

Forest margins, thickets, grasslands, open fields, streamsides; below 100–1500 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

- 1a. Young stems densely hirtellous, hispidulous, strigillose, pilosulous, or puberulent to glabrescent; leaf blade lanceolate to elliptic, 2.2–9 × 0.6–3 cm; secondary veins 4–6 pairs 4a. var. *auricularia*
- 1b. Young stems longitudinally sulcate,

glabrous except villosulous to pilosulous and sometimes also hirsute to pilose inside grooves; leaf blade ovate to lanceolate, elliptic, or elliptic-oblong, 1.2–3 × 0.4–1.4 cm; secondary veins 2–4 pairs 4b. var. *mina*

4a. *Hedyotis auricularia* var. *auricularia*

耳草(原变种) er cao (yuan bian zhong)

Exallage auricularia (Linnaeus) Bremekamp; *Oldenlandia auricularia* (Linnaeus) K. Schumann.

Stems densely hirtellous, hispidulous, strigillose, pilosulous, or puberulent to glabrescent with pubescence mostly uniform. Leaf blade lanceolate to elliptic, 2.2–9 × 0.6–3 cm; secondary veins 4–6 pairs; stipules with 3–9 linear to setiform lobes to 5 mm. Inflorescences glomerulate to congested-cymose, several to many flowered; pedicels to 1 mm. Fl. and fr. Mar–Dec.

Forest margins, thickets, grasslands; below 100–1500 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

The Chinese range of this taxon was not mentioned by Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) but was long known to other authors.

4b. *Hedyotis auricularia* var. *mina* W. C. Ko, Fl. Hainan. 3: 578. 1974.

细叶亚婆潮 xi ye ya po chao

Stems at least when young longitudinally sulcate, villosulous to pilosulous and sometimes also hirsute to pilose inside grooves. Leaf blade ovate to lanceolate, elliptic, or elliptic-oblong, 1.2–3 × 0.4–1.4 cm; secondary veins 2–4 pairs; stipules entire and acute to aristate or sometimes with 2 setose lobes to 2 mm. Inflorescences subcapitate to congested-cymose, 2–7-flowered in each node; pedicels to 3 mm. Fl. almost year-round.

• Wet or humid open fields, streamsides, thickets; ca. 200 m. Guangdong, Guangxi, Hainan.

5. *Hedyotis baotingensis* W. C. Ko, J. S. China Agric. Univ. 16(4): 43. 1995.

保亭耳草 bao ting er cao

Little branched herbs, prostrate, 40–60 cm tall; stems terete to flattened, scabrous. Leaves petiolate, often congested and appearing verticillate at top of stem; petiole 10–15 mm; blade drying papery, elliptic, elliptic-oblong, ovate, or obovate, 4–13 × 3–6 cm, adaxially glabrous, abaxially sparsely hirtellous at least along veins, base obtuse then decurrent, apex obtuse then sometimes abruptly and shortly acute; secondary veins 5–12 pairs; stipules narrowly triangular, long acuminate, marginally erose. Inflorescence and flowers unknown. Infructescence terminal, capitate, subglobose, 2–2.5 cm in diam., sessile. Fruit indehiscent, sessile or subsessile, globose or ellipsoid, 1–1.5 mm in diam., pilosulous; persistent calyx lobes narrowly spatulate-oblong, narrowly lanceolate, or linear, 5–5.5 mm, striate; seeds 3 or 4, black, angled. Fr. Oct.

• Broad-leaved forests on shady slopes. Hainan (Baoting).

6. *Hedyotis biflora* (Linnaeus) Lamarck, Tabl. Encycl. 1: 272. 1792.

双花耳草 shuang hua er cao

Oldenlandia biflora Linnaeus, Sp. Pl. 1: 119. 1753; *Hedyotis paniculata* (Linnaeus) Lamarck; *H. racemosa* Lamarck; *O. crassifolia* Candolle; *O. paniculata* Linnaeus.

Herbs, annual or perennial, erect to procumbent, to 15(–30) cm tall; stems 4-angled to subterete and/or sulcate, glabrous. Leaves subsessile to petiolate; petiole to 0.5 cm, glabrous; blade drying papery to subleathery, elliptic-oblong, elliptic-ovate, obovate, oblanceolate, or elliptic, 1–4 × 0.3–1 mm, glabrous, base acute to obtuse then abruptly decurrent, apex acute to rounded; secondary veins indistinct; stipules fused to petioles, triangular, 1–2 mm, glabrous, usually costate, acute to long acuminate. Inflorescences terminal and in axils of uppermost leaves, cymose to compound-cymose, 1–6 cm, glabrous, 2–12-flowered, pedunculate; peduncles 0.5–3 cm; bracts triangular to lanceolate, 0.5–3 mm; pedicels 0.5–10 mm. Flowers subsessile to pedicellate, apparently distylous. Calyx glabrous; hypanthium portion turbinate, 0.5–1 mm; limb lobed essentially to base; lobes triangular, 0.3–1 mm. Corolla white, sometimes flushed with lavender, tubular to somewhat urceolate, outside glabrous or puberulent in lines; tube 1.2–2 mm, barbate in throat; lobes spatulate-oblong, 1–1.5 mm. Anthers included or exerted, 0.3–0.5 mm. Stigma exerted or apparently included, ca. 0.2 mm. Fruit capsular, subglobose, oblate, or hemispherical, 2.5–3 mm in diam., loculicidally dehiscent across top, beak 0.5–1 mm high, pedicels usually elongating; seeds numerous, black, foveolate. Fl. and fr. Jan–Sep.

Limestone mountains, coastal areas, weedy fields, wastelands; sea level to 1200 m. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Taiwan, Yunnan [India, Indonesia, Malaysia, Nepal, Vietnam; SE Asia to Pacific islands].

The circumscription and name of this species is controversial or, at best, complicated. These are small herbs of ruderal sites and thus probably respond markedly to local conditions, in particular growing to a larger size with larger leaves, inflorescences, and fruit in sites with better conditions. Similar species that have been variously synonymized but are separated here include *Hedyotis strigulosa* and *H. pterita*; see further discussion under *H. strigulosa*. Alternatively Biju et al. (Rheedea 2(1): 11–18. 1992) separated *H. biflora* from *H. racemosa* (syn. *Oldenlandia paniculata*); their treatment is carefully done but regional, and because their key does not correspond well with the Chinese plants, their conclusions are not accepted here.

The name *Oldenlandia crassifolia* was placed in synonymy with both *Hedyotis biflora* and *H. coreana* (*H. strigulosa*) by W. C. Ko (in FRPS 71(1): 39, 77. 1999). The only other author who studied this name in any detail, Merrill (Enum. Philipp. Fl. Pl. 3(4): 492–512; 3(5): 513–576. 1923), cited this as a synonym of *H. biflora* and is followed here.

7. *Hedyotis bodinieri* H. Lévillé, Repert. Spec. Nov. Regni Veg. 11: 64. 1912.

大冒山耳草 da mao shan er cao

Oldenlandia bodinieri (H. Lévillé) Chun.

Herbs or shrubs; stems pilosulous. Leaf blade drying

membranous, margins not revolute when dry. Inflorescence shortly cymose. Flowers pedicellate. Calyx lobes sublinear, acute, as long as corolla tube. Corolla white; tube slightly longer than lobes. Anthers included. Fl. May.

- Mountaintops. Hong Kong (Damao Shan).

This very poorly known species is not included in the key to species here. It may will turn out to be an older name for an otherwise-known species.

8. *Hedyotis brachypoda* (Candolle) Sivarajan & Biju, Taxon 39: 672. 1990.

拟定经草 ni ding jing cao

Oldenlandia brachypoda Candolle, Prodr. 4: 424. 1830.

Slender herbs, annual, diffusely branched, to 50 cm tall; stems terete to slightly flattened, glabrous. Leaves sessile or subsessile; blade drying membranous, linear, narrowly elliptic, or narrowly spatulate, 7–36 × 1–4 mm, adaxially glabrous (sometimes appearing papillose due to collapsed, large epidermal cells) to scaberulous and usually shiny, abaxially glabrous and matte, base acute, margins usually revolute at least when dry, apex acute; secondary veins not evident; stipules fused to petiole bases, glabrous, truncate to broadly triangular, 0.8–2 mm, with 1–3 linear to setiform lobes 0.2–1 mm. Inflorescences pseudoaxillary, 1-flowered (2-flowered and fasciculate), glabrous, sessile or with peduncle to 3 mm, ebracteate. Flowers subsessile to shortly pedunculate, homostylous. Calyx glabrous; hypanthium portion globose, 1–1.2 mm; limb lobed essentially to base; lobes triangular, 1–1.5 mm. Corolla white, rotate, outside glabrous; tube 1–1.5 mm, glabrous at throat; lobes triangular, 1–1.5 mm. Anthers ca. 0.3 mm, exserted. Stigma ca. 0.8 mm, exserted. Fruit capsular, membranous to papery, compressed globose to subglobose or somewhat dicocous, ca. 2.5 × 3–4 mm, loculicidally dehiscent through flattened top, peduncles to 8 mm; seeds ca. 20, dark brown, angled, deeply and thickly foveolate. Fl. and fr. (Feb–)Mar–Nov.

Paddy fields, ridges of farmlands, humid open fields; below 100–1500 m. Anhui, Guangdong, Guangxi, Hainan, Yunnan [Bangladesh, Bhutan, India, Indonesia, Japan, Malaysia (Malacca), Nepal, Philippines, Vietnam].

The taxonomy of this and related species is complicated, and different authors have drawn very different conclusions (e.g., Sivarajan & Biju, loc. cit.: 665–674; Dutta & Deb, Taxon. Rev. *Hedyotis*. 2004). In particular, *Hedyotis corymbosa*, *H. diffusa*, and *H. erecta* Manilal & Sivarajan are related and have been variously circumscribed. Here, these species are circumscribed generally, though not completely, following Sivarajan and Biju (loc. cit.) and W. C. Ko (in FRPS 71(1): 72, 75. 1999).

9. *Hedyotis bracteosa* Hance, J. Bot. 23: 323. 1885.

大苞耳草 da bao er cao

Oldenlandia bracteosa (Hance) Kuntze.

Herbs, erect, to 50 cm tall; stems glabrous, 4-angled with angles rounded to acute or winged, wings to 1 mm wide. Leaves sessile or subsessile; blade drying papery, elliptic-oblong or oblong-lanceolate, 12–15 × 2–4 cm, glabrous, base

obtuse to cordulate then abruptly narrowed, apex acute or shortly acuminate; secondary veins ca. 7 pairs, weakly marked or not visible; stipules fused to petiole bases, broadly triangular to ovate, 4–12 mm, glabrous, with 2 winged flanges 1–2.5 mm wide extending from each petiole base to apex, entire or glandular-serrulate, acute to acuminate. Inflorescence axillary, capitate, glabrous, pedunculate; peduncles 2.5–7 cm; involucre bracts 2 or 4, ovate, 10–25 × 9–18 mm; head hemispherical, 10–16 mm in diam.; floral bracts narrowly lanceolate, 1–4 mm; pedicels 0.2–1 mm. Flowers subsessile to shortly pedicellate, distylous. Calyx glabrous; hypanthium portion ellipsoid, ca. 1 mm; limb lobed nearly to base; lobes ovate or lanceolate, 2.2–3 × 1.2–2 mm, often pinnately veined, sometimes ciliolate, obtuse to acute. Corolla white, tubular or tubular-funnelform, outside glabrous; tube ca. 4 mm, pilosulous inside in upper half and throat; lobes lanceolate to triangular, ca. 1.5 mm, acute. Anthers exserted and ca. 0.8 mm in short-styled form, in long-styled form not seen. Stigmas ca. 0.5 mm and positioned near middle of corolla tube in short-styled form, ca. 1 mm and exserted in long-styled form. Fruit capsular, subglobose to ellipsoid, ca. 2 mm, glabrous, septicidal then perhaps rather tardily loculicidal, with calyx limb persistent; seeds numerous, black, angled, rugose. Fl. Apr–Jul, fr. Jul.

- Sparse forests on mountain slopes or on humid lands in valleys/ravines. Guangdong.

W. C. Ko (in FRPS 71(1): 56. 1999) described the corolla as having lobes as long as the corolla tube, but this has not been seen on specimens studied nor reported by other authors.

10. *Hedyotis brevicalyx* Sivarajan, Biju & P. Mathew, Kew Bull. 48: 393. 1993.

伞形花耳草 san xing hua er cao

Oldenlandia umbellata Linnaeus, Sp. Pl. 1: 119. 1753; *Hedyotis umbellata* (Linnaeus) Lamarck (1792), not Walter (1788).

Herbs, annual or perennial, diffusely branched, to 40 cm tall; stems 4-angled perhaps becoming terete, ribbed, scaberulous. Leaves opposite but often crowded and appearing verticillate, sessile; blade drying papery, linear to narrowly lanceolate, 10–20 × 1–3 mm, adaxially punctate and glabrescent, abaxially scaberulous along midrib, base acute, margins flat to revolute, apex acute; secondary veins indistinct; stipules fused to petioles, glabrescent, truncate to rounded, 1–1.5 mm, with 2–5 bristles 1–2 mm. Inflorescence terminal and sometimes in uppermost axils, congested-cymose to congested-umbelliform, several flowered, scaberulous, pedunculate; peduncles 1–2 cm; branched portion ca. 3 cm; bracts stipuliform, ca. 1 mm; pedicels 0.5–1.2 mm. Flowers distylous, shortly pedicellate. Calyx apparently glabrous; hypanthium portion subglobose to ovoid, 0.3–1 mm; limb lobed essentially to base; lobes lanceolate to triangular, 1–2 mm, ciliate. Corolla white, tubular, outside glabrous; tube 1.5–2.2 mm, glabrous inside; lobes lanceolate, 1.5–2 mm, inside sparsely pubescent. Anthers 0.5–1 mm, included or exserted. Stigmas 0.8–1 mm, included or exserted. Fruit capsular, compressed globose to weakly didymous, 2–2.5 × 2–2.5 mm, loculicidally dehiscent across top, glabrous to scaberu-

lous, perhaps papery; seeds several, blackish brown.

Sandy lands at sea beaches; sea level to near sea level [100–900 m in India]. Hainan (Lingshui) [India, Indonesia (Java), N Myanmar, Pakistan, Sri Lanka, Vietnam].

There is some disagreement over the identity and correct name of this species; whether *Hedyotis brevicalyx* actually occurs in China is unknown as yet, and the description here is taken from Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004, as *H. puberula* (G. Don) R. Brown ex Arnott). The plant illustrated for this species (as *H. umbellata*) in FRPS (71(1): 70, t. 13, f. 1–6. 1999) is actually *H. pinifolia*, and its description there seems to combine some characters of both *H. brevicalyx* sensu Dutta & Deb and *H. pinifolia*.

11. *Hedyotis butensis* Masamune, Trans. Nat. Hist. Soc. Formosa 28: 119. 1938.

台湾耳草 tai wan er cao

Herbs, erect, annual, to 20 cm tall; stems terete to 4-angled, hirsute. Leaves sessile; blade drying papery, elliptic-oblong, oblanceolate, ovate-lanceolate, or lanceolate, 1.5–6 × 0.3–1 cm, adaxially puberulent to scaberulous, abaxially densely villous to hirsute, base cuneate to attenuate, apex acute to acuminate; stipules broadly triangular, ca. 3 mm, hirsute, acuminate. Inflorescences terminal and/or axillary, capitate or glomerulate; bracts linear, to 1.5 mm. Flowers sessile. Calyx hirsute; hypanthium portion ovoid, ca. 1.5 mm; lobes linear to deltoid, ca. 1.5 mm. Corolla white, funnelform, pubescent inside and out; tube 0.8–2.3 mm; lobes oblong-linear, ca. 0.2 mm. Anthers exerted. Fruit indehiscent or dehiscent across top, subglobose, somewhat compressed laterally, 1.5–2 mm in diam.; seeds numerous, angled. Fl. Jul–Sep.

- Taiwan (Yilan).

This species is poorly known, and the available descriptions are limited. It is included in the key to species twice, for the described hirsute stems and the potentially glabrous stems, a condition eventually found in most pubescent species of *Hedyotis* (and other Rubiaceae) and one that can be confirmed as more specimens become available.

12. *Hedyotis cantoniensis* F. C. How ex W. C. Ko, J. S. China Agric. Univ. 16(4): 42. 1995.

广州耳草 guang zhou er cao

Herbs or subshrubs, erect, perennial, to 60 cm tall; stems subterete, sometimes striate, glabrous. Leaves subsessile to petiole; petiole to 8 mm, glabrous; blade drying thinly leathery, ovate, oblong-elliptic, narrowly elliptic, or narrowly lanceolate, 3–13 × 0.8–3 cm, glabrous, base acute to cuneate, apex acute to shortly acuminate; secondary veins indistinct; stipules fused to petiole bases, triangular to broadly triangular, 2–5 mm, glabrous, marginally entire to densely glandular serrate, acute to aristate with tip to 4 mm. Inflorescences terminal and in axils of uppermost leaves, cymose, paniculate and pyramidal to narrowly cylindrical or racemiform, 1–15 cm, several to many flowered, glabrous, sessile and tripartite or pedunculate; peduncles 1–4.5 cm; bracts narrowly elliptic to triangular, 0.5–4 mm; pedicels to 1 mm. Flowers sessile to pedicellate, distylous. Calyx glabrous; hypanthium portion subglobose to obconic, 1–1.2 mm; limb 1–2 mm, deeply lobed; lobes triangular to narrowly

triangular. Corolla salverform to tubular-funnelform, outside glabrous; tube 2.5–3.5 mm, sparsely barbate in throat; lobes oblong-lanceolate, 2–2.2 mm. Anthers included or exerted, ca. 1.1 mm. Stigmas included or exerted, ca. 0.3 mm when exerted. Fruit capsular, ellipsoid to subglobose, 2–3 mm, septically then loculicidally dehiscent, glabrous, cartilaginous to somewhat woody, apex flat or with low rounded beak; seeds several, angled. Fl. Apr–Aug, fr. Jun–Nov.

- Sparse forests; 200–1000 m. Guangdong.

This species as provisionally circumscribed here is similar to *Hedyotis matthewii* and slightly differently (and more narrowly) than done by W. C. Ko (in FRPS 71(1): 48. 1999).

13. *Hedyotis capitellata* Wallich ex G. Don, Gen. Hist. 3: 527. 1834.

头花耳草 tou hua er cao

Herbs or shrubs, lianescent, climbing, clambering, or scandent, to 1 m; stems terete to weakly 4-angled, often longitudinally ridged and/or sulcate, glabrous or hirtellous to pilosulous or hispidulous at least in longitudinal lines, or tomentose in var. *mollissima*. Leaves subsessile to petiole; petiole to 4 mm, glabrous to puberulent or hispidulous, or tomentose (var. *mollissima*); blade drying membranous, ovate, lanceolate, elliptic, or elliptic-lanceolate, 2–12 × 1–4 cm, glabrous or sparsely to moderately puberulent to hispidulous or hirtellous, or tomentose (var. *mollissima*), base acute to obtuse then often decurrent, apex acute to shortly or long acuminate; secondary veins 3 or 4 pairs; stipules fused to petiole bases, glabrous to densely puberulent, hispidulous, or strigillose, or tomentose (var. *mollissima*), triangular, 1.5–5 mm, entire or serrulate at margins, acute to acuminate with tip 0.5–1.5 mm, often spreading to recurved. Inflorescences terminal and often also in axils of uppermost leaves, 4–25 cm, with 3–15 globose, capitate to subcapitate heads in groups of 3, groups then paniculate, pyramidal, densely puberulent to hirtellous or glabrous, or tomentose (var. *mollissima*), pedunculate; peduncle 1–5 cm; bracts subtending axes triangular to oblanceolate, 1–10 mm, bracts subtending flowers reduced to a tuft of pubescence; heads 3–6 mm in diam. (not including corollas), 8–15 mm in diam. (including corollas). Flowers sessile or subsessile, distylous. Calyx glabrous to densely puberulent; hypanthium portion campanulate to obconic, 0.8–1 mm; limb lobed for 1/3–3/4, 1–2 mm; lobes oblong to narrowly triangular. Corolla white to pale blue, funnelform, outside glabrous, inside densely bearded in throat and onto lobes; tube 1–2 mm; lobes ligulate, 3–5 mm. Anthers included or exerted, 1–1.2(–2) mm. Stigmas linear, 1–2 mm. Fruit capsular, ellipsoid to globose, 2–3 mm in diam., glabrescent, septically then loculicidally dehiscent (but see discussion below); seeds numerous, angled. Fl. almost year-round, fr. not seen from China.

Broad-leaved forests in valleys, sunny mountain slopes; ca. 1500 m. Yunnan [India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam].

The fruit is described above following W. C. Ko (in FRPS 71(1): 65. 1999); however, Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) described this differently, as loculicidal across the top beak portion, then sometimes tardily septical.

W. C. Ko (loc. cit.: 65–66) reported the varieties below from China; they are treated following that work here for reference. Dutta and Deb (loc. cit.) reported only *Hedyotis capitellata* var. *subpubescens* Kurz from China; this name was not mentioned by Ko but presumably corresponds to one of Dutta and Deb's varieties.

- 1a. Plants glabrous 13a. var. *capitellata*
1b. Plants pubescent.
2a. Stems, inflorescences, calyx, and
leaf blade sparsely pubescent 13b. var. *mollis*
2b. Stems, inflorescences, calyx, and
leaf blade densely pale yellow
tomentose 13c. var. *mollissima*

13a. *Hedyotis capitellata* var. *capitellata*

头状花耳草(原变种) tou zhuang hua er cao (yuan bian zhong)

Oldenlandia capitellata (Wallich ex G. Don) Kuntze; *O. capitellata* var. *glabra* Pitard; *O. rubioides* Miquel.

Plants glabrous. Fl. May, fr. not seen from China.

Broad-leaved forests in valleys; ca. 1500 m [as low as below 100 m in India]. Yunnan [India, Indonesia, Malaysia, Myanmar, Thailand].

13b. *Hedyotis capitellata* var. *mollis* (Pierre ex Pitard) T. N. Ninh in T. B. Nguyen, Fl. Taynguyen. Enum. 150. 1984.

疏毛头状花耳草 shu mao tou zhuang hua er cao

Oldenlandia capitellata var. *mollis* Pierre ex Pitard in Lecomte, Fl. Indo-Chine 3: 137. 1922.

Stems, leaf blade, inflorescences, and calyx sparsely pubescent. Fl. Apr–Jul, fr. not seen from China.

Broad-leaved forests at middle elevations. Yunnan (Hekou) [India, Indonesia, Malaysia, Vietnam].

Ninh's varietal combination was not known to W. C. Ko (loc. cit.: 66), who intended to publish it himself but was precluded.

13c. *Hedyotis capitellata* var. *mollissima* (Pitard) W. C. Ko, Fl. Reipubl. Popularis Sin. 71(1): 66. 1999.

绒毛头状花耳草 rong mao tou zhuang hua er cao

Oldenlandia capitellata var. *mollissima* Pitard in Lecomte, Fl. Indo-Chine 3: 138. 1922.

Stems, leaf blade, inflorescences, and calyx densely pale yellow tomentose. Fl. almost year-round, fr. not seen from China.

Sunny mountain slopes at middle to high elevations. Yunnan (Xishuangbanna) [Vietnam].

14. *Hedyotis capituligera* Hance, J. Bot. 17: 12. 1879.

败酱耳草 bai jiang er cao

Oldenlandia capituligera (Hance) Kuntze.

Leggy herbs, erect, to 80 cm tall; stems terete to 4-angled, longitudinally usually sulcate, sparsely villosulous or hirtellous to densely so at least in longitudinal lines, becoming glabrescent. Leaves sessile to shortly petiolate; blade drying membranous, oblong-lanceolate, 3.5–11.5 × 0.8–3.5 cm, adaxially glabrous or sparsely to densely puberulent, hirtellous, or hispid,

abaxially glabrescent on lamina and hispid to pilosulous or pilose along veins, base acute to rounded, margins ciliate, apex obtuse to acute; secondary veins 5–8 pairs; stipules fused to petiole bases, triangular, 1.5–4 mm, moderately to densely hirtellous or villosulous, with 2–4 bristles or linear to narrowly triangular lobes 1.5–4 mm. Inflorescences terminal on main stems, short lateral stems, and sometimes also in axils of uppermost leaves, several to many flowered, with 1–8 congested-cymose to subcapitate heads or glomerules, these usually in compound cymes 2–18 cm, densely villosulous to strigillose or glabrescent, pedunculate; peduncles 1–10 cm; heads 0.8–1.5 cm in diam.; bracts narrowly triangular to narrowly elliptic, 1.2–7 mm. Flowers subsessile. Calyx glabrous; hypanthium portion subglobose, ca. 0.8 mm; limb lobed nearly to base; lobes triangular, 0.3–0.6 mm. Corolla white, funnellform, outside glabrous; tube ca. 3 mm, stiffly barbate in throat; lobes ca. 1.3 mm, thickened at apex. Fruit capsular, compressed globose, dehiscent; seeds several. Fl. Jul–Aug.

- Open grasslands. Guangdong, Guizhou, Yunnan.

15. *Hedyotis cathayana* W. C. Ko, Fl. Hainan. 3: 579. 1974.

中华耳草 zhong hua er cao

Herbs or shrubs, presumably perennial, erect, to 80(–100) cm tall; stems glabrous, 4-angled, angles sharp to winged, wings to 2 mm wide. Leaves sessile or subsessile; blade drying papery to membranous, purple on midrib at least when young, elliptic-oblong, lanceolate, or oblanceolate, 15–25 × 3–6 cm, glabrous, base obtuse to rounded or truncate, apex acute to long acuminate; secondary veins 7 or 8 pairs, hardly visible; stipules apparently fused shortly around stem, broadly triangular, 4–12 mm, glabrous, with 2 winged flanges 1–2 mm wide extending from each petiole base up to apex, acute to acuminate, entire, sparsely glandular-serrate, or with 1 to numerous bristles 0.1–2 mm, gland-tipped. Inflorescence axillary, congested-cymose to shortly paniculate or subglomerulate, 1.5–3.5 cm, glabrous, subsessile to pedunculate; peduncles to 2 cm; bracts linear-lanceolate, lanceolate, or narrowly elliptic, 1–12 mm; pedicels to 1.5 mm. Flowers subsessile to pedicellate, ?apparently distylous. Calyx glabrous; hypanthium turbinate, 1–1.3 mm; limb deeply lobed; lobes narrowly triangular to spatulate, 2–3 mm, sometimes slightly unequal. Corolla white or pale green, funnellform to tubular-funnelform, outside glabrous; tube 6–9 mm, bearded in throat; lobes spatulate-oblong, 2.5–4 mm. Anthers exerted, 1–1.5 mm. Stigma ca. 1.5 mm, included, positioned just above middle of corolla tube. Fruit capsular, subglobose to ovoid, 2–3 × 1.5–2 mm, septicial then loculicidal, papery, glabrous; seeds 4–6, blackish brown, angled, papillose. Fl. and fr. almost year-round, often simultaneously.

- On wet soil in valleys and ravines; ca. 500 m. Hainan.

The specimen *H. Y. Liang 54367* (NY, Web!) was annotated as "*Hedyotis Liangii* Merr. & Chun," but this name was apparently never published.

16. *Hedyotis caudatifolia* Merrill & F. P. Metcalf, J. Arnold Arbor. 23: 228. 1942.

劍叶耳草 *jian ye er cao*

Hedyotis hui Diels.

Shrubs or perhaps subshrubs, erect, perennial, to 90 cm tall; stems terete, shallowly striate, glabrous. Leaves petiolate; petiole 10–15 mm; blade drying leathery, grayish white abaxially, lanceolate, 6–13 × 1.5–3 cm, base cuneate or decurrent, apex caudate-acuminate; secondary veins ca. 4 pairs but indistinct; stipules broadly ovate, 2–3 mm, entire or glandular-serulate, acute. Inflorescences compound-cymose to paniculate, several to many flowered; axes generally dichotomous; bracts lanceolate or linear-lanceolate. Flowers shortly pedicellate. Calyx with hypanthium portion turbinate, ca. 3 mm; limb deeply lobed; lobes ovate-triangular. Corolla white or pink, tubular, outside glabrous; tube 4–8 mm, barbate in throat; lobes lanceolate. Stigmas exerted or included. Fruit capsular, ellipsoid-oblong or ellipsoid, ca. 2.5 × 2 mm, smooth, glabrous, dehiscent; seeds several, black, subtriangular. Fl. May–Jun.

• Dry soil in jungles, thickets, on rock cliffs, on clay soil in grasslands. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

W. C. Ko (in FRPS 71(1): 48. 1999) described the petioles of this species as 10–15 mm and the hypanthium as ca. 3 mm, but the accompanying figure (p. 50, t. 7, f. 7–10) does not show these features.

17. *Hedyotis cheniana* R. J. Wang, Novon 18: 264. 2008.

焕镛耳草 *huan yong er cao*

Subshrubs, erect, to 0.5 m tall; stems terete to sulcate, glabrous to densely puberulent, strigillose, or pilosulous. Leaves petiolate; petiole 3–5 mm, glabrous to densely pilosulous; blade drying papery, ovate, elliptic, ovate-oblong, or suborbicular, 1.7–5 × 1.6–2.5 cm, adaxially glabrescent, abaxially puberulent to pilosulous, base broadly obtuse to rounded or truncate, apex acute or shortly acuminate; secondary veins 3 or 4 pairs, poorly to well developed abaxially; stipules persistent, interpetiolar, triangular, 2–3.5 mm, glabrous or densely pilosulous, lacerate or with 5–9 linear lobes or bristles. Inflorescences terminal and in uppermost leaf axils, subcapitate, 1–2 cm in diam., 10–30-flowered, puberulent to pilosulous, subsessile to pedunculate; peduncles to 3 mm; bracts narrowly triangular to linear, 1–3 mm; pedicels 0.5–2 mm. Flowers distylous, shortly pedicellate. Calyx glabrous; hypanthium portion subglobose-ellipsoid, 0.8–1 mm; limb lobed nearly to base; lobes narrowly triangular, 3.5–4 mm, entire to ciliate, acuminate. Corolla white, salverform, outside glabrous; tube ca. 5 mm, barbate in throat; lobes spatulate-oblong to lanceolate, ca. 2 mm. Anthers exerted or situated in corolla throat, 1–1.5 mm. Stigmas included or exerted, ca. 1 mm. Fruit capsular, subglobose, ca. 2 mm, glabrous, loculicidal then septicial; seeds 6–10, angled, reticulate. Fl. Jan–Feb, fr. Jun–Nov.

• Dense forests; 600–1000 m. Hainan.

The protologue described *Hedyotis cheniana* as being glabrous, but two specimens cited there are in fact densely pubescent; the protologue also described the secondary veins as not visible, but in fact they are well developed and usually prominulous abaxially on these specimens.

18. *Hedyotis cherevensis* (Pierre ex Pitard) Fukuoka, S. E.

Asian Stud. 8(3): 332. 1970.

越南耳草 *yue nan er cao*

Oldenlandia cherevensis Pierre ex Pitard in Lecomte, Fl. Indo-Chine 3: 143. 1922.

Herbs, erect, perhaps perennial, to 50 cm tall; stems flattened to 4-angled, often ridged, glabrous or puberulent to hispidulous at and shortly below nodes. Leaves subsessile to petiolate; petiole to 2 mm, puberulent to hispidulous; blade drying membranous, ovate, lanceolate, or elliptic, 2–7 × 0.8–3 cm, adaxially glabrous or puberulent on principal veins, abaxially sparsely to densely puberulent or hispidulous at least on principal veins, base cuneate to rounded then decurrent, apex acute to acuminate; secondary veins 5–7 pairs; stipules fused to petiole bases, ovate-lanceolate to triangular, 3–5 mm, densely puberulent, hirtellous, or hispidulous, acuminate to aristate, marginally lacinate or with several filamentous lobes to 1 mm, often glandular at apex. Inflorescences terminal and sometimes in axils of uppermost leaves, cymose to paniculate, 3–7 cm, several to many flowered, glabrous, usually slender, pedunculate; peduncles 1–2 cm; bracts lanceolate, 0.8–1 mm; pedicels 6–10 mm. Flowers all pedicellate. Calyx glabrous; hypanthium portion obconical, 0.5–0.8 mm; limb lobed essentially to base; lobes triangular, 0.1–0.3 mm. Corolla white, tubular to rotate, outside glabrous; tube 0.5–1 mm, inside apparently glabrous; lobes oblong-lanceolate, ca. 0.5 mm. Anthers exerted, ca. 0.5 mm. Stigma apparently exerted, ca. 0.2 mm. Fruit capsular, obconical, turbinate, or subglobose, often somewhat didymous, 1.5–2 × 1–1.5 mm, glabrous, loculicidally dehiscent across top, beak rounded, ca. 0.4 mm high; seeds ca. 10, dark brown, angled. Fl. May–Jul.

On damp humus soil in forests; [below 100–1300 m in Thailand]. Hainan [Cambodia, Thailand, Vietnam].

The name *Hedyotis cherevensis* has been attributed to W. C. Ko (Fl. Hainan. 3: 306, 579. 1974), but this appears to be a later, superfluous combination.

19. *Hedyotis chrysotricha* (Palibin) Merrill, Lingnan Sci. J. 7: 322. 1931.

金毛耳草 *jin mao er cao*

Anotis chrysotricha Palibin, Bull. Herb. Boissier, sér. 2, 6: 20. 1906; *Oldenlandia chrysotricha* (Palibin) Chun.

Herbs, perennial or perhaps annual, procumbent, usually regularly rooting at nodes, to 40 cm; stems weakly 4-angled, flattened, or terete, sometimes 2-sulcate, moderately to densely hirtellous to pilosulous at least along grooves, sometimes glabrescent, trichomes often drying yellowed. Leaves subsessile to petiolate; petiole 1–3 mm, moderately to densely pilosulous to hirtellous; blade drying thinly papery, lanceolate, elliptic, or ovate, 0.8–3.2 × 0.5–1.4 cm, adaxially sparsely hirtellous, hispidulous, or scaberulous at least along margins, abaxially sparsely to densely hirtellous or pilosulous with pubescence denser along principal veins or sometimes glabrous (e.g., *Tsang 20859*, MO!), base cuneate or obtuse, apex obtuse to acute or shortly acuminate; secondary veins 2 or 3 pairs; stipules fused to petiole bases, triangular, 1–2 mm, moderately to densely pu-

berulent to hirtellous, with 1–3 linear lobes or bristles 1.5–3.5 mm, these sometimes glandular and/or bifid at apex. Inflorescences axillary, congested-cymose to fasciculate, 3–10 mm in diam., (1 or) 2–5-flowered in each axil, moderately to densely pilosulous, sessile or subsessile; bracts linear, lanceolate, or narrowly elliptic, 0.5–4 mm; pedicels to 4 mm. Flowers subsessile to pedicellate, distylous. Calyx sparsely to densely hirtellous; hypanthium portion subglobose to obconic, ca. 1 mm; limb lobed essentially to base; lobes lanceolate to triangular, ca. 2 mm, usually ciliolate to ciliate. Corolla white or purple, funnel-form, outside pilosulous to glabrous; tube 2.5–4 mm, pubescent inside; lobes linear-oblong to triangular, 2.5–3 mm. Anthers exerted or included, 1–1.2 mm. Stigma exerted or included, 1–1.2 mm. Fruit indehiscent, subglobose to ovoid, 1.5–2 × 2–2.5 mm, with calyx lobes to 3 mm; seeds several. Fl. and fr. year-round.

Broad-leaved forests in valleys, thickets on mountain slopes; 100–900 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Yunman, Zhejiang [Japan, ?Philippines].

20. *Hedyotis communis* W. C. Ko, Fl. Hainan. 3: 579. 1974.

大众耳草 da zhong er cao

Subshrubs or herbs, erect, to 1.5 m tall; stems glabrous, flattened to 4-angled or terete. Leaves sessile to subsessile; blade drying papery, narrowly elliptic-oblong or narrowly elliptic, on vegetative stems, 10–17 × 1.5–2.6 cm, glabrous, base cuneate to acute then usually long decurrent, apex acute to acuminate; secondary veins 6–8 pairs, abaxially indistinct; stipules shortly united around stem or sometimes fused to petiole bases, triangular to narrowly triangular, 8–13 mm, glabrous, long acuminate, marginally sometimes sparsely glandular-serrulate or -setose. Inflorescence axillary, paniculate-cymose with small cymes distributed along axes with leaflike bracts and bracteal stipules, or along axillary branches with reduced leaves (depending on interpretation), 7–24 cm, many flowered, glabrous, pedunculate; peduncle 0.5–4 cm; leaflike bracts or reduced leaves paired, lanceolate to narrowly elliptic, 10–40 mm; cymes 8–15 mm, several flowered; floral bracts linear or linear-lanceolate, 2–8 mm; pedicels to 1 mm. Flowers subsessile to pedicellate. Calyx glabrous; hypanthium portion ellipsoid, 1–1.2 mm; limb lobed nearly to base; lobes narrowly triangular, 2–3 mm. Corolla white, tubular, outside glabrous; tube 4.5–5 mm, bearded in throat; lobes spatulate-oblong to triangular, 2–2.5 mm, acute. Anthers exerted, ca. 1.2 mm. Stigma included, ca. 0.8 mm. Fruit capsular, obovoid or subglobose, 2–3 × 2–2.5 mm, glabrous, septically then loculicidally dehiscent, cartilaginous; seeds 2–4, brownish black, tuberculate. Fl. almost year-round, fr. May, Jun, Oct.

● On soil rich in humus in valleys or at streamsides; 900–1000 m. Hainan.

The inflorescences are borne laterally along well-developed axes with numerous leaflike bracts or reduced leaves, or alternatively along lateral branches with reduced leaves; various morphological descriptions of these have been used by different authors.

21. *Hedyotis consanguinea* Hance, Ann. Sci. Nat., Bot., sér. 4,

18: 221. 1862.

拟金草 ni jin cao

Hedyotis lancea Thunberg ex Maximowicz; *Oldenlandia consanguinea* (Hance) Kuntze; *O. lancea* (Thunberg ex Maximowicz) Kuntze.

Herbs or subshrubs, erect, perennial, to 40 cm tall; stems terete, flattened, or weakly 4-angled, smooth to sulcate, glabrous. Leaves subsessile to petiolate, sometimes appearing verticillate due to axillary groups of reduced leaves on unexpanded lateral stems; petiole to 6 mm, glabrous; blade drying stiffly papery to leathery, lanceolate, ovate, elliptic, lanceolate-elliptic, or elliptic-oblong, 1.5–12 × 0.4–4 cm, glabrous, base acute to obtuse and usually decurrent, margins plane to thinly revolute, apex acute to usually acuminate; secondary veins 2–4 pairs but mostly indistinct; stipules fused around stem, ovate to broadly triangular, 2–5.5 mm, glabrous, marginally glandular-serrulate, acute to acuminate or shortly aristate. Inflorescences terminal and in axils of uppermost leaves, compound-cymose, paniculate, 3–15 cm, many flowered, glabrous, pedunculate; peduncle 1–7 cm; axes strictly dichotomous then often spiciform (due to development of only 1 lateral axis, leaving 1 or 2 flowers at node), or sometimes scorpioid (due to development of alternating axes); bracts triangular to elliptic, 0.8–5 mm or those subtending principal axes sometimes leaflike; pedicels to 1 mm. Flowers sessile to shortly pedicellate, apparently distylous. Calyx glabrous; hypanthium portion obconic, 0.8–1 mm; limb deeply lobed; lobes lanceolate to triangular, 0.8–1.2 mm. Corolla white, salverform, outside glabrous; tube 1.5–2.5 mm, inside sparsely villosulous; lobes lanceolate, 1.5–2.5 mm. Anthers included or exerted, ca. 0.8 mm. Stigma apparently included or exerted, ca. 0.3 mm. Fruit capsular, ellipsoid, ca. 2 × 2 mm, glabrous, woody, flattened to rounded on top, septically then loculicidally dehiscent; seeds numerous, blackish brown, angled. Fl. and fr. Jun–Nov.

● Grasslands, ditch sides; 400–1000 m. Fujian, Guangdong, Hainan, Zhejiang.

In the description here a distinction is made between the inflorescence axes and the pedicels; measurements in other descriptions sometimes include inflorescence axes that bear only a developed flower together with an undeveloped bud on an apparently indeterminate segment as pedicels and, thus, are correspondingly longer.

22. *Hedyotis corymbosa* (Linnaeus) Lamarck, Tabl. Encycl. 1: 272. 1792.

伞房花耳草 san fang hua er cao

Slender herbs, annual, to 40 cm tall; stems 4-angled to flattened, 2-sulcate, with sides glabrous and angles thickened to winged and puberulent and/or scaberulous (var. *corymbosa*) or terete to flattened and sparsely to densely scaberulous to puberulent throughout (var. *tereticaulis*). Leaves subsessile; blade drying membranous, linear, narrowly lanceolate, or narrowly elliptic, 0.8–2 × 0.1–0.5 cm, adaxially sparsely scaberulous to glabrescent, abaxially glabrescent, base cuneate to acute, margins usually at least shortly revolute at least when dry, apex acute; secondary veins not visible; stipules fused to petiole bases, tubular, 1–2 mm, puberulent to glabrous, rounded to

triangular, with 1–5(or 7) linear lobes or bristles 0.2–2.5 mm, these sometimes bifid. Inflorescence axillary, 1-flowered or usually cymose and 2–5-flowered, glabrous, pedunculate; peduncles 1(or 2) per axil, filiform, 1–16 mm; bracts lacking or stipuliform and 1–1.2 mm; pedicels slender, 2–12 mm. Flowers homostylous, pedicellate. Calyx glabrous to puberulent; hypanthium portion subglobose to narrowly ellipsoid, 0.5–0.8 mm; limb lobed essentially to base; lobes narrowly triangular, 0.5–1.2 mm, entire to ciliate. Corolla white or pink, funnelliform to rotate; tube 0.8–1 mm, inside pubescent or glabrous; lobes spatulate-oblong to narrowly triangular, 0.5–0.8 mm. Anthers included, ca. 0.6 mm. Stigma 0.3–0.5 mm, included. Fruit capsular, subglobose, ovoid, or obovate, 1.2–2 × 1.2–2.2 mm, somewhat dicocous, membranous, glabrous to puberulent, loculicidally dehiscent through flat to broadly rounded apex, beak when present to 0.5 mm, peduncles and pedicels usually elongating rapidly and markedly as fruit develop; seeds 20 or more, dark brown, angled, smooth. Fl. and fr. almost year-round.

Paddy fields, ridges of farmlands, humid grasslands; sea level to 900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Zhejiang [Africa and tropical Asia; widely adventive in the Americas and the Pacific region].

These plants are low annual weeds found in highly disturbed habitats and show wide morphological variation between sites and usually among plants in one site in plant size, leaf width, number of peduncles per axil, and number of flowers per peduncle. The taxonomy of this and related species is complicated, and different authors have drawn very different conclusions (e.g., Sivarajan & Biju, Taxon 39: 665–674. 1990; Dutta & Deb, Taxon. Rev. *Hedyotis*. 2004). In particular, *Hedyotis brachypoda*, *H. diffusa*, and *H. erecta* are related and have been variously circumscribed. Here, these species are circumscribed generally though not completely following Sivarajan and Biju (loc. cit.) and W. C. Ko (in FRPS 71(1): 72, 75. 1999). However, W. C. Ko described the hypanthium of *H. corymbosa* as 1–1.2 mm in diam., which corresponds to *H. diffusa* in most recent classifications rather than *H. corymbosa*. The varieties recognized by W. C. Ko are presented here for reference.

- 1a. Stems quadrangular, glabrous to pubescent and/or scaberulous along angles 22a. var. *corymbosa*
- 1b. Stems terete to flattened, farinose puberulent throughout 22b. var. *tereticaulis*

22a. *Hedyotis corymbosa* var. *corymbosa*

伞房花耳草(原变种) san fang hua er cao (yuan bian zhong)

Oldenlandia corymbosa Linnaeus, Sp. Pl. 1: 119. 1753; *Pharaceum incanum* Loureiro.

Stems quadrangular, glabrous to pubescent and/or scaberulous along angles. Fl. and fr. almost year-round.

Paddy fields, ridges of farmlands, humid grasslands. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Zhejiang [Africa, America, tropical Asia].

22b. *Hedyotis corymbosa* var. *tereticaulis* W. C. Ko, Fl. Hainan. 3: 580. 1974.

圆茎耳草 yuan jing er cao

Hedyotis burmanniana Wight & Arnott (1834), not

Schultes (1827); *H. pseudocorymbosa* Bakhuizen f.; *Oldenlandia pseudocorymbosa* (Bakhuizen f.) Raizada.

Stems terete to flattened, farinose puberulent throughout. Fl. and fr. almost year-round.

- Ridges of farmlands, humid open fields. S and SW China.

This variety may correspond to *Hedyotis diffusa* as circumscribed by Sivarajan and Biju (loc. cit.) and to *H. pseudocorymbosa* as circumscribed by some other authors (e.g., Bakhuizen f., Fl. Java 2: 286. 1965; Dutta & Deb, loc. cit.).

23. *Hedyotis cryptantha* Dunn, Bull. Misc. Inform. Kew 1912: 367. 1912.

闭花耳草 bi hua er cao

Oldenlandia cryptantha (Dunn) Chun.

Herbs, perennial, procumbent, to 50 cm tall; stems 4-angled, sulcate, glabrous to puberulent, sometimes with wings to 4 mm wide. Leaves sessile to petiolate, sometimes clustered near top of stem; petiole to 15 mm; blade with midrib often purple, drying papery, elliptic, oblanceolate, or obovate, 15–30 × 5–10 cm, glabrous (but sometimes when dry appearing puberulent due to collapsed large epidermal cells), base acute to attenuate and long decurrent, apex acute to long acuminate; secondary veins 5–7 pairs, sometimes with well-developed intersecondary veins; stipules interpetiolar, narrowly triangular, 8–30 mm, glabrous, lacinate or with 5 to numerous setiform segments or lobes 1–20 mm, these sometimes apparently glandular at apex. Inflorescences axillary at nodes well below stem apex, capitate, subcapitate, or congested-cymose, 1.5–2.5 cm in diam., several to many flowered, glabrous, sessile; bracts linear-lanceolate, 5–8 mm, acute to erose or shortly lacinate. Flowers sessile or subsessile, biology unknown. Calyx glabrous; hypanthium portion subglobose, ca. 2 mm; limb lobed essentially to base; lobes linear-lanceolate, 6–8 mm. Corolla white to pale purple, salverform or tubular, outside apparently glabrous; tube 14–16 mm, inside tomentulose from above middle to throat; lobes narrowly ovate, ca. 3 mm. Anthers included, 1–1.2 mm. Fruit indehiscent, obovoid, laterally somewhat flattened, ca. 3 × 2 mm, glabrous, with calyx lobes to 10 mm; seeds angled, black, foveolate. Fl. Sep–Nov, fr. Oct–Jan.

- Forests in humid shady valleys, rock crevices at streamsides; 300–1000 m. Hainan (Lingshui).

24. *Hedyotis dianxiensis* W. C. Ko, J. S. China Agric. Univ. 16(4): 44. 1995.

滇西耳草 dian xi er cao

Herb, climbing to scandent; stems flattened to subterete, often angled and/or sulcate, densely villous and usually also tomentose. Leaves petiolate; petiole 1–2.5 mm, densely villous or tomentose; blade drying papery, lanceolate, lanceolate-elliptic, or narrowly ovate, 2–9 × 0.6–3 cm, adaxially moderately to densely hispidulous with pubescence denser on principal veins, abaxially densely pilosulous to hirtellous throughout, base cuneate to rounded, apex acute to long acuminate; secondary veins 3–5 pairs; stipules interpetiolar, broadly rounded to truncate, 1–3.5 mm, densely villosulous or pilosulous, with 3–9

bristles or linear lobes 1–6 mm. Inflorescences terminal and in axils of uppermost leaves, capitate, subcapitate, or glomerulate, densely pilosulous or hirtellous, sessile or pedunculate; peduncle 2–12 mm; heads 1–10, solitary or borne separately along peduncles or axes, each subglobose, 1–2 cm in diam., 15–30-flowered; bracts reduced. Flowers sessile or subsessile, distylous. Calyx with hypanthium portion turbinate to subglobose, ca. 1 mm, densely hispid; limb deeply lobed; lobes spatulate-oblong, triangular, or lanceolate, 1.2–2 mm, hispidulous to glabrescent. Corolla yellowish green, funnelform, outside glabrous to pilosulous, inside densely bearded in throat and onto lobes; tube ca. 2 mm; lobes spatulate-oblong to triangular, ca. 4 mm. Anthers 0.8–1.2 mm, exerted or included. Stigma 0.5–0.8 mm, exerted or included. Fruit capsular, subglobose to obovoid, 3.5–4 mm, pilosulous or hirtellous, cartilaginous, septicidally then later loculicidally dehiscent, with conical beak ca. 1 mm; seeds several, angled. Fl. Feb–May, fr. Jun.

• Humid thickets at streamsides; 600–800 m. Yunnan (Xishuangbanna).

Although all specimens seen of this species are pubescent, which agrees with the descriptions available, it is keyed out here also with glabrescent stems in case glabrous individuals are eventually found, as in most pubescent Rubiaceae species.

25. *Hedyotis diffusa* Willdenow, Sp. Pl. 1: 566. 1798.

白花蛇耳草 bai hua she er cao

Hedyotis herbacea Loureiro (1790), not Linnaeus (1753); *Oldenlandia diffusa* (Willdenow) Roxburgh; *O. herbacea* (Linnaeus) Roxburgh var. *uniflora* Benth.

Slender herbs, annual, ascending to procumbent, to 50 cm tall; stems slightly flattened to terete or young stems sometimes 4-angled, sparsely to densely puberulent, scaberulous, or glabrescent to glabrous, similarly glabrous or pubescent on angles and to sides. Leaves sessile or subsessile; blade drying membranous, linear, narrowly elliptic, or narrowly oblanceolate, 1–4 × 0.1–0.4 cm, adaxially glabrous and smooth or often scaberulous near margins, abaxially glabrous to scaberulous, base acute, margins usually revolute at least when dry, apex acute; secondary veins not visible; stipules fused to petiole bases, triangular to truncate, 0.5–1.5 mm, glabrescent, acute to aristate or with 1–3 bristles 0.2–1 mm. Inflorescences axillary, 1-flowered or fasciculate and 2-flowered, glabrous, pedunculate; peduncles or pedicels 4–20 mm; bracts none or stipuliform, to 1 mm. Flowers pedicellate, apparently homostylous. Calyx glabrous; hypanthium portion subglobose, 1–1.2 mm; limb lobed essentially to base; lobes narrowly triangular, 1–2 mm, ciliolate. Corolla white, tubular, outside glabrous; tube 1.5–2.5 mm, glabrous inside; lobes ovate-oblong, 1.2–2 mm. Anthers ca. 0.8 mm, exerted. Stigma ca. 1.2 mm, exerted. Fruit capsular, compressed globose to oblate, 2–3 × 2–3 mm, sometimes somewhat dicocous, membranous, glabrous, loculicidally dehiscent on flat to beaked top, beak rounded, to 0.5 mm, with peduncles elongating rapidly and markedly as fruit mature, to 20 mm; seeds ca. 20, dark brown, angled, deeply thickly foveolate. Fl. and fr. May–Oct.

Paddy fields, ridges of farmlands, humid open fields; sea level to 900 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan,

Zhejiang [Bangladesh, Bhutan, Indonesia, Japan, Malaysia, Nepal, Philippines, Sri Lanka, Thailand].

This species is very commonly collected in China. The taxonomy of this and related species is complicated, and different authors have drawn very different conclusions (e.g., Sivarajan & Biju, Taxon 39: 665–674. 1990; Dutta & Deb, Taxon. Rev. *Hedyotis*. 2004). In particular, *Hedyotis brachypoda*, *H. corymbosa*, and *H. erecta* are related and have been variously circumscribed. Here, these species are circumscribed generally, though not completely, following W. C. Ko (in FRPS 71(1): 72, 75. 1999) and Dutta and Deb.

26. *Hedyotis effusa* Hance, J. Bot. 17: 11. 1879.

鼎湖耳草 ding hu er cao

Oldenlandia effusa (Hance) Kuntze.

Herbs or shrubs, perennial, erect, to 1 m or taller; stems rounded, flattened, or 4-angled, glabrous. Leaves subsessile to petiolate; petiole to 5 mm, glabrous; blade drying papery or leathery, ovate, ovate-lanceolate, or lanceolate-elliptic, 4–13 × 1.5–6.5 cm, glabrous, base cuneate to rounded, apex acute; secondary veins indistinct; stipules united around stem, broadly triangular or truncate, 1–3 mm, glabrous, entire, sometimes partially costate, acute to mucronate. Inflorescences terminal, compound-cymose to paniculate, 5–15 × 4–10 cm, glabrous, several to many flowered, pedunculate; peduncles 2–7 cm; axes regularly dichotomous, spreading at 90° or more; bracts triangular to linear, 0.5–5 mm; pedicels 2–5 mm. Flowers pedicellate. Calyx glabrous; hypanthium portion ovoid, 0.7–1 mm; limb 0.5–0.8 mm, lobed for 1/2–2/3, lobes triangular. Corolla white, funnelform to tubular, outside glabrous; tube ca. 1.5 mm, apparently barbate in throat; lobes narrowly triangular, ca. 1.5 mm. Anthers and stigmas not seen. Fruit capsular, subglobose, 1.5–2.5 mm, glabrous, stiffly papery to cartilaginous, septicidally then loculicidally dehiscent; seeds several, angled. Fl. Jul–Sep, fr. Aug–Mar.

• Forests or streamsides in valleys, sometimes on humid hill slopes; 200–400 m. Guangdong, Guangxi.

27. *Hedyotis exserta* Merrill, Lingnan Sci. J. 13: 72. 1934.

长花轴耳草 chang hua zhou er cao

Herbs or shrubs, erect, perennial, to 70 cm; stems terete to flattened, smooth or sulcate, glabrous. Leaves petiolate; petiole 2–5 mm, puberulent; blade drying papery, lanceolate, narrowly elliptic, or narrowly lanceolate, 5.5–11 × 0.8–3 cm, adaxially glabrous or papillose at least near margins, abaxially glabrous, base cuneate to acute, apex acute to long acuminate; secondary veins 4–6 pairs but indistinct; stipules fused to petiole bases, triangular to broadly triangular, 3–8 mm, glabrous or papillose-puberulent, smooth or costate, entire or serrulate, acute to caudate-acuminate. Inflorescences terminal and in uppermost leaf axils, congested-cymose, fastigiate to subglobose, 2–3 cm, densely puberulent, several to many flowered, pedunculate; peduncle 5.5–9 cm; bracts triangular, oblong-ovate, or narrowly elliptic, 0.8–6 mm; pedicels 1–2 mm. Flowers pedicellate. Calyx densely papillose or farinose puberulent; hypanthium portion turbinate, 1–1.5 mm; limb deeply lobed; lobes oblong-ovate to triangular, 1–1.8 mm. Corolla purple or pink, salverform, outside farinose puberulent; tube 7–10 mm, inside pilose;

lobes oblong-ovate, 1.2–2 mm. Anthers positioned in throat. Stigmas included, positioned near middle of corolla tube, ca. 2 mm. Fruit capsular, subglobose to ellipsoid and somewhat laterally flattened, 2–2.5 mm in diam., puberulent, flat on top, dehiscent; seeds several, blackish brown, angled. Fl. May–Sep.

Slopes or thickets in valleys. Hainan [Vietnam].

28. *Hedyotis hainanensis* (Chun) W. C. Ko, Fl. Hainan. 3: 580. 1974.

海南耳草 hai nan er cao

Oldenlandia hainanensis Chun, Sunyatsenia 1: 311. 1934, based on *Hedyotis oligantha* Merrill, Philipp. J. Sci. 23: 266. 1923, not Merrill (1921).

Shrubs, erect, to 30 cm tall; stems terete, densely puberulent to pilosulous. Leaves subsessile to petiolate; petiole to 2 mm, densely puberulent to pilosulous; blade drying papery, subelliptic, broadly elliptic, or ovate, 1–2.5 × 0.8–1.5 cm, adaxially glabrous, abaxially densely puberulent at least along midrib, base obtuse to cuneate, margins sometimes thinly revolute when dry, apex obtuse, acute, or shortly acuminate; secondary veins ca. 3 pairs but indistinct; stipules fused to petiole bases, triangular or ovate, ca. 0.5 mm, puberulent to pilosulous, with 3 short narrow lobes. Inflorescences terminal and also in axils of uppermost leaves, capitate or 2-flowered, sessile. Flowers sessile. Calyx sparsely puberulent; hypanthium portion ovoid, ca. 2 mm; limb lobed nearly to base; lobes 5, narrowly lanceolate, 3–3.5 mm. Corolla blue or white, funnellform, outside glabrous; tube ca. 8 mm, bearded in throat; lobes 5, oblong-lanceolate, ca. 4 mm. Anthers 5, included, ca. 1.8 mm. Stigmas not seen. Fruit not seen. Fl. May–Jun.

• Dense forests. Hainan (Ding'an).

The protologue did not describe the fruit; these were described by W. C. Ko (in FRPS 71(1): 62. 1999, modified to format here) as “Fruit capsular, globose, laterally flattened, ca. 2 mm in diam., sparsely hispidulous, septically dehiscent then loculicidally dehiscent, with persistent calyx lobes” with the same fruiting period as the flowers. However, this description exactly matches the fruit of a group of plants that have been included in *Hedyotis hainanensis* but do not match the type and are provisionally separated here.

29. *Hedyotis hedyotide* (Candolle) Merrill, Lingnan Sci. J. 13: 48. 1934.

牛白藤 niu bai teng

Spermacoce hedyotide Candolle, Prodr. 4: 555. 1830; *Hedyotis esquirolii* H. Léveillé; *H. macrostemon* Hooker & Arnott; *H. nantoensis* Hayata; *H. recurva* Benthams; *Oldenlandia esquirolii* (H. Léveillé) Chun; *O. macrostemon* (Hooker & Arnott) Kuntze.

Shrubs or subshrubs, lianescent, clambering, scandent, or climbing, to 5 m; stems flattened to subterete then often later 4-angled, densely papillose to farinose puberulent or velutinous-strigillose. Leaves petiolate; petiole 1–10 mm, densely papillose, puberulent, or strigillose; blade drying membranous to papery, elliptic-oblong, lanceolate, elliptic, or ovate, 4–10 × 1.5–4 cm, adaxially glabrous or densely papillose to puberulent on principal veins, abaxially glabrous or densely papillose to pu-

berulent or occasionally velutinous-strigillose, base cuneate to rounded, apex acute or shortly acuminate; secondary veins 3–5 pairs; stipules fused to petioles, truncate to broadly rounded, 1.8–3 mm, glabrous to densely papillose, puberulent, or velutinous-strigillose, entire to densely ciliolate and/or with 3–7 narrowly triangular to linear lobes or bristles 1–7 mm, at least sometimes gland-tipped. Inflorescences terminal and in axils of uppermost leaves, subcapitate, congested-cymose, compound-cymose, or paniculate, 1–16 cm, several flowered, with 1–10 congested to laxly cymose groups of flowers, densely granular-puberulent to tomentulose-velutinous, pedunculate; peduncles 0.5–2.5 cm; flower groups subglobose to hemispherical, 1–1.5 cm in diam. (not including corollas), 1.8–3 cm in diam. (including corollas); bracts triangular, narrowly elliptic, or narrowly lanceolate, 0.2–2 mm; pedicels 0.8–2 mm. Flowers pedicellate, distylous. Calyx densely puberulent; hypanthium portion turbinate, 1–1.2 mm; limb 2–2.5 mm, lobed essentially to base; lobes linear-lanceolate to spatulate, usually reflexed at anthesis. Corolla white to pale yellow, tubular to funnellform, outside glabrous, inside densely bearded in throat and onto lobes; tube 2–3 mm; lobes narrowly lanceolate to narrowly spatulate, 4–4.5 mm. Anthers exerted or long exerted, 1.2–2 mm. Stigmas exerted or long exerted, 0.8–1 mm in long-styled form, ca. 2 mm in short-styled form. Fruit capsular, subglobose, obovoid, or oblong-ellipsoid, 2.5–3 mm, densely puberulent to glabrescent, cartilaginous to very stiffly papery, loculicidally then septically dehiscent through apical beak, beak 0.5–1 mm; seeds several, angled. Fl. and fr. Apr–Dec.

Thickets in ravines, hill slopes; 200–1000 m. Fujian, Guangdong, Guangxi, Guizhou, ?Hainan, Taiwan, Yunnan [Cambodia, Thailand, Vietnam].

The flowers appear to be sessile in heads, but closer study shows they are shortly pedicellate. W. C. Ko (in FRPS 71(1): 67. 1999) described the leaves as scabrous above, but this has not been seen nor reported by other authors. Ko also described the anthers of the long-styled flowers as included within the corolla, but they are all distinctly exerted on the specimens studied; this character has not been specifically described by other authors.

W. C. Ko (loc. cit.) said that this species was treated as “*Hedyotis fruticosa*” by Kuntze (Obs. 2: 8. 1781), but in fact Kuntze’s name was not applied to the same species described by Linnaeus. The name *H. nantoensis* was overlooked by the Fl. Taiwan (ed. 2, 4: 265–273. 1998) but seems to be validly published and clear as to its identity. Fukuoka (S. E. Asia Stud. 8(3): 326. 1970) reported this species from Hainan based on plants here treated as *H. obliquinervis*, which he treated as a variety of *H. hedyotide*.

30. *Hedyotis herbacea* Linnaeus, Sp. Pl. 1: 102. 1753.

丹草 dan cao

Hedyotis heynii (G. Don) Beddome; *Oldenlandia herbacea* (Linnaeus) Roxburgh; *O. heynii* G. Don.

Herbs, annual or biennial, generally erect, to 60 cm; stems weakly to sharply 4-angled, glabrous to scaberulous at least on angles. Leaves sessile or subsessile; blade linear or linear-lanceolate, 1–2.5 × 0.1–0.3 mm, glabrous to scaberulous, base acute to obtuse, margins weakly to strongly revolute, apex acute; secondary veins not visible; stipules reduced or fused to petiole bases, glabrous to scaberulous, truncate to broadly tri-

angular, to 0.3 mm, entire or with 1–5 triangular to linear lobes or bristles 0.2–2 mm. Inflorescences axillary, 1-flowered or several flowered and fasciculate to cymose, glabrous, apparently ebracteate, pedunculate; peduncles 1–3 per axil, 1–30 mm; pedicels 1–30 mm. Flowers homostylous or heterostylous, subsessile to pedicellate. Calyx glabrous to puberulent; hypanthium portion subglobose to ovoid, 0.8–1 mm; limb lobed essentially to base; lobes narrowly triangular to linear, 0.5–1.5 mm. Corolla white to reddish or pale purple, funnelliform, outside glabrous; tube 2–3 mm, glabrous at throat; lobes spatulate-oblong, 0.5–1 mm. Anthers exerted or included, 0.2–0.4 mm. Stigma ca. 0.8 mm, included or exerted. Fruit capsular, ovoid to subglobose, 2–2.5 × 2–2.5 mm, loculicidally dehiscent through apical beak 1–1.5 mm; seeds several, dark brown, foveolate. Fl. and fr. Jan, Mar–Apr.

On humid rocks. Fujian, Guangdong, Guangxi, Hainan, Jiangxi [widespread in tropical Africa and Asia].

Very few specimens have been seen of this species from China (or anywhere else east of Sri Lanka); the description here, therefore, is based primarily on plants from India. W. C. Ko (FRPS 71(1): 73. 1999) described the hypanthium as 1.8–2 mm, the calyx lobes as 2.5–2.8 mm and fimbriate-serrulate, the corolla lobes as ca. 2 mm, and the anthers as ca. 1.5 mm, but these features do not agree with specimens of *Hedyotis herbacea*; they do apply to the rather similar species *H. brachypoda* and *H. diffusa*.

31. *Hedyotis hermanniana* R. M. Dutta, J. Econ. Taxon. Bot. 23: 734. 1999.

赫尔曼耳草 he er man er cao

Herbs, annual or perennial, erect to procumbent, to 15(–20) cm tall; stems subterete to angled or sulcate, glabrous. Leaves subsessile to petiolate; petiole to 2 mm; blade drying papery, ovate, lanceolate, or elliptic, 1–2.5(–5) × 0.5–1.5 cm, adaxially sparsely or moderately hispidulous to glabrescent, abaxially glabrous, base acute to obtuse, margins scaberulous, apex obtuse to acute; secondary veins 2 or 3 pairs but mostly indistinct; stipules fused to petiole bases, broadly triangular, 0.5–1.5 mm, hirtellous or puberulent to glabrescent, rounded to truncate, sometimes apiculate or with 2 or 3 bristles to 1 mm. Inflorescences terminal and in axils of uppermost leaves, fasciculate to loosely dichasial, few flowered, glabrous; peduncles and/or pedicels 2–15 cm; bracts reduced or triangular to setiform, to 1 mm. Flowers pedicellate or pedunculate, floral biology unknown. Calyx glabrous; hypanthium obconic, ca. 1 mm; limb lobed nearly to base; lobes ovate, ca. 1.2 mm, sometimes with evident venation, ciliolate. Corolla white sometimes tinged with pink, salverform, outside glabrous; tube ca. 1.5 mm, inside glabrous; lobes ovate, ca. 0.5 mm. Anthers and stigmas not seen. Fruit capsular, oblate-cupuliform, 2.5–3 × 3.5–4 mm, glabrous, smooth, loculicidally dehiscent across top then sometimes septical, with beak to 1 mm, with calyx lobes becoming elliptic to ovate, to 2 mm; seeds numerous, subglobose.

Mountains; ca. 1600 m. Yunnan [India, Sri Lanka].

The description here is based on Chinese material. Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) described the corolla of *Hedyotis hermanniana* in India as having tubes 3–4 mm and lobes 1.5–2 mm, although their figure shows a corolla with a tube slightly over 1 mm and the lobes ca. 2 mm.

32. *Hedyotis koana* R. J. Wang, Acta Phytotax. Sin. 45: 696. 2007.

蕴璋耳草 yun zhang er cao

Herbs, erect, to 40 cm tall; stems 4-angled to terete, glabrous. Leaves sessile; blade drying subleathery, linear, 1.4–4 × 0.1–0.15 cm, glabrous, base cuneate, margins revolute, apex acute; secondary veins not visible; stipules fused to petiole bases, triangular, 1–1.8 mm, glabrescent, with 1–3 bristles 0.5–1 mm. Inflorescences terminal and sometimes in uppermost leaf axils, cymose, 2–12-flowered, glabrous, pedunculate; axes ascending; bracts narrowly lanceolate, 1–5 mm, acute to aristate; pedicels 3–20 mm. Flowers pedicellate, biology unknown. Calyx glabrous; hypanthium ovoid to subglobose, 1–1.5 mm; limb deeply lobed; lobes triangular to lanceolate, 1–1.7 mm, acute to acuminate. Corolla white, tubular, glabrous outside; tube 1.5–2.5 mm, glabrous inside; lobes elliptic-oblong to lanceolate, 0.9–1.2 mm. Fruit capsular, subglobose to ovoid, 1.2–2 × 2–3 mm, glabrous, stiffly papery, loculicidally dehiscent from top; seeds several, angled. Fl. and fr. Jun–Sep.

• Weedy open areas; sea level to 200 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi.

33. *Hedyotis lianshanensis* W. C. Ko, J. S. China Agric. Univ. 16(4): 41. 1995.

连山耳草 lian shan er cao

Subshrubs, erect, to 80 cm tall; stems hollow, 4-angled to terete, smooth or sulcate, glabrous or usually sparsely hispidulous to puberulent just below stipules when young. Leaves subsessile to petiolate; petiole 3–5 mm, glabrous; blade drying papery, narrowly elliptic-oblong, narrowly elliptic, lanceolate, or ovate, 6–12 × 1.5–4 cm, glabrous or rarely scaberulous adaxially along midrib, base cuneate to acute and usually decurrent, apex acute to long acuminate; secondary veins 4 or 5 pairs; stipules fused to petiole bases, obovate, elliptic, or triangular, 3–6 mm, glabrous or puberulent when young, lacerate or with 7 to numerous narrow lobes or bristles 0.5–7 mm, these often glandular at apex. Inflorescence axillary, glomerulate, subglobose, 5–15 mm in diam., glabrous, sessile; bracts narrowly triangular to linear, 1–2 mm. Flowers sessile to subsessile, biology unknown. Calyx glabrous to puberulent; hypanthium portion cupulate to subglobose, 1–1.2 mm; limb lobed essentially to base; lobes lanceolate, narrowly triangular, narrowly ligulate, or linear, 1.5–3 mm, ciliolate. Corolla funnelliform, outside glabrous; tube 1.8–2 mm, glabrous inside; lobes lanceolate to triangular, 1–2.5 mm. Anthers partially exerted. Stigmas exerted. Fruit indehiscent, ellipsoid to subglobose, 1.2–2 mm, glabrescent, with pedicels to 2 mm; seeds numerous, angled. Fl. Feb–Jul, fr. Jul–Dec.

• Sparse forests in valleys; 200–700 m. Guangdong (Liangshan).

The protologue described the flowers as shortly pedicellate, but on the specimens studied they are sessile at anthesis with the pedicels or stipes elongating as the fruit develop. W. C. Ko (in FRPS 71(1): 41. 1999) described the fruit as sometimes dehiscent across the top, but the protologue described them as indehiscent, which agrees with the specimens studied.

34. *Hedyotis lineata* Roxburgh, Fl. Ind. 1: 369. 1820.

东亚耳草 *dong ya er cao*

Exallage ulmifolia (Wallich) Bremekamp; *Hedyotis ulmifolia* Wallich; *Oldenlandia lineata* (Roxburgh) Kuntze.

Herbs or subshrubs, annual or perennial, clambering or perhaps erect, to 35 cm tall; stems 4-angled, flattened, or subterete, sometimes sulcate, densely villous, hirsute, or pilose with trichomes drying yellowed. Leaves sessile or petiolate; petiole to 3 mm, hirsute or villous; blade drying papery, ovate-lanceolate, elliptic-lanceolate, or elliptic, (0.5–)1.5–3.5(–4) × 1.2–4.5 cm, adaxially sparsely to moderately strigillose to strigose on blade and densely pilosulous on principal veins, abaxially glabrescent on blade and moderately to densely strigose to pilose on principal veins, base obtuse to rounded, apex acute to shortly acuminate; secondary veins 3 or 4 pairs; stipules interpetiolar or fused to petiole bases, broadly triangular to subtruncate, 2–4 mm, densely villous to pilose, with 3 or 5 linear lobes or bristles 2–7 mm. Inflorescences axillary, congested-cymose to fasciculate or subglomerulate, subglobose, 5–15 mm in diam., several flowered, subsessile to pedunculate; peduncles several in each axil, 0.5–4 mm; bracts linear, 1–2 mm; pedicels to 2 mm. Flowers subsessile to pedicellate, biology unknown. Calyx hirtellous; hypanthium portion subcupulate to obconic, ca. 0.8 mm; limb deeply (but not completely) lobed; lobes triangular, 1–1.2 mm. Corolla white, salverform to rotate, outside glabrous except lobes pilose at tip; tube 1–1.5 mm, pubescent in throat; lobes triangular, 1–1.5 mm. Anthers 0.5–0.8 mm, exerted. Stigma 0.3–0.5 mm. Fruit indehiscent, subglobose to turbinate, 1–1.2 × 1.5–2 mm, hirtellous; seeds 36–40, 0.8–1 mm. Fl. Jun, perhaps Nov, fr. Nov.

Broad-leaved forests at high elevations; [100–1100 m in India]. Yunnan (Menghai) [Bangladesh, India, Myanmar, Nepal].

The names *Hedyotis ulmifolia* and *H. lineata* appear to have been published simultaneously; the basis for choosing the name *H. lineata* is not explained in the references consulted but seems to be consistent usage (e.g., Fl. Bhutan 2(2): 761. 1999; Dutta & Deb, Taxon. Rev. *Hedyotis*. 2004).

We have seen no corollas, anthers, or stigmas from China; the description of these parts here is from Dutta and Deb (loc. cit.). W. C. Ko (in FRPS 71(1): 34. 1999) described the corolla tube as 3 × as long as the lobes, which does not agree with the information given by any other authors for this species. Also the elevational range of “at high elevations” given for this species by Ko contrasts markedly with information on the specimens seen and the low to middle elevations noted by other authors.

35. *Hedyotis loganioides* Benth., Fl. Hongk. 149. 1861.

粤港耳草 *yue gang er cao*

Oldenlandia loganioides (Benth.) Kuntze.

Herbs, erect, perennial, to 30 cm tall; stems terete, weakly angled, or weakly flattened, glabrous. Leaves subsessile to petiolate; petiole 0.5–4 mm, glabrous to puberulent; blade drying papery, elliptic-oblong, lanceolate, or elliptic, 1.5–6 × 1–3.5 cm, glabrous, base acute to cuneate, apex acute to shortly acuminate; secondary veins 3–5 pairs but hardly visible; stipules apparently interpetiolar, ovate-triangular to lanceolate, 2–2.5 mm, puberulent to glabrous, entire to shortly ciliate, ob-

tuse to rounded. Inflorescences axillary, cymose, 0.8–2 cm, sometimes trichotomous and compact, 10–20-flowered, glabrous; peduncles 2–10(–20) mm; bracts triangular to narrowly triangular, 0.5–3.5 mm; pedicels 1–2 mm. Flowers pedicellate, floral biology unknown. Calyx glabrous; hypanthium portion subglobose to flattened-ovoid, ca. 1 mm; limb lobed nearly to base; lobes linear to narrowly triangular, 1.5–2.2 mm. Corolla outside glabrous. Fruit capsular, ellipsoid to subglobose, ca. 2 × 2–2.3 mm, glabrous, cartilaginous to stiffly papery, smooth, apparently septicial then loculicidal, beak broadly triangular to conical, up to 0.5 mm; seeds few. Fr. Dec.

• Guangdong.

36. *Hedyotis longiserta* Merrill & F. P. Metcalf, J. Arnold Arbor. 23: 229. 1942.

上思耳草 *shang si er cao*

Herbs or subshrubs, erect, to 50 cm tall; stems terete, glabrous, smooth. Leaves petiolate; petiole 3–5 mm, glabrous; blade lanceolate or oblong-lanceolate, 5–7 × 1–1.5 cm, base cuneate or obtuse, apex acuminate or acute; secondary veins ca. 3 pairs but very indistinct; stipules fused to petiole bases, broadly ovate, ca. 3 mm, abruptly narrowed apically to acute, marginally weakly glandular-serrulate. Inflorescences terminal, compound-cymose, 7–12 cm, several to many flowered; secondary axes few, racemiform, 3–4 cm, higher order axes shorter, becoming scorpioid; bracts linear-lanceolate or linear, 0.8–1.2 cm. Flowers pedicellate and/or sessile. Calyx glabrous; hypanthium portion ovoid, 1–1.2 mm; lobes triangular-ovate, ca. 0.5 mm. Corolla white, outside glabrous; tube ca. 1.5 mm, inside densely bearded; lobes broadly ovate, rounded. Fruit capsular, oblong-ellipsoid, 2–2.5 × ca. 1.5 mm, septicially then loculicidally dehiscent; seeds several, black. Fl. Jun–Jul.

• Dry open fields, mountain slopes. Guangxi (Shangsi).

37. *Hedyotis longipetala* Merrill, J. Arnold Arbor. 8: 18. 1927.

长瓣耳草 *chang ban er cao*

Oldenlandia longipetala (Merrill) Chun.

Subshrubs, erect, to 40 cm tall; stems glabrous, terete to 4-angled with angles obtuse to acute or ridged. Leaves sessile to petiolate; petiole to 8 mm, glabrous; blade drying stiffly leathery, narrowly lanceolate, narrowly elliptic, or linear-lanceolate, 3–8 × 0.4–1.2 cm, glabrous and shiny, base cuneate to usually acute and decurrent, margins revolute at least when dry, apex long acuminate; secondary veins indistinct; stipules interpetiolar, triangular, ovate, or oblong-ovate, 3–5 mm, glabrous, shiny and hardened, acute to acuminate. Inflorescence terminal and sometimes in uppermost leaf axils, congested-cymose to subcapitate, flattened-globose, 1.5–2 cm in diam., glabrous, several to many flowered, sessile, subtended by 2 pairs of leaves or leaflike bracts with inner (i.e., distal) pair ca. 1/2 as large as outer (i.e., proximal), or axillary cymes few flowered and without leaflike bracts; floral bracts elliptic to triangular, 2–6 mm; pedicels to 2 mm. Flowers sessile to shortly pedicellate. Calyx glabrous, shiny; hypanthium portion obconic, ca. 1 mm; limb lobed for ca. 1/2; lobes triangular, lanceolate, or spatulate, 2–4

mm. Corolla white, tubular; tube ca. 3.5 mm, pilosulous in throat; lobes lanceolate, ca. 11 mm. Anthers ca. 2 mm. Fruit capsular, ovoid or ellipsoid, 3–4 mm in diam., glabrous, cartilaginous to hard, septicidal then tardily loculicidal; seeds several. Fl. Apr–Jun, fr. Jul–Sep.

• Broad-leaved forests on mountaintops, grasslands at roadsides; ca. 800 m. Fujian, Guangdong.

The dry plants have a yellowish-brownish cast and a distinctive shiny, hardened surface on all parts.

38. *Hedyotis matthewii* Dunn, J. Bot. 47: 376. 1909.

疏花耳草 shu hua er cao

Hedyotis acuminatissima Merrill; *Oldenlandia matthewii* (Dunn) Chun.

Herbs or subshrubs, erect, perennial, branched, to 75 cm tall; stems terete to 4-angled, glabrous. Leaves sessile to petiolate; petiole to 8 mm, glabrous; blade drying papery to subleathery, narrowly elliptic, elliptic, or lanceolate, 3.5–12 × 0.8–3 cm, glabrous, base acute to obtuse, apex acute to long acuminate; secondary veins ca. 3 pairs but indistinct; stipules fused to petiole bases, broadly triangular to ovate-triangular, 2–4.5 mm, glabrous, sometimes costate, marginally entire to glandular-serrulate, acute to acuminate and sometimes thickened at apex. Inflorescences terminal and usually also in axils of uppermost leaves, cymose, paniculate, or racemiform, 6–12 × 1.5–7 cm, glabrous, several to many flowered, sessile and apparently tripartite or pedunculate; peduncles 1–4 cm; axes mostly dichotomous; bracts linear-lanceolate, 1–7 mm; pedicels 0.5–4 mm. Flowers sessile to pedicellate, distylous. Calyx glabrous; hypanthium turbinate or obovoid, 1–1.5 mm; limb 1.5–2.2 mm, lobed for 1/2 to deeply lobed; lobes lanceolate to triangular. Corolla white or purplish, funnellform, outside glabrous; tube 3.5–4 mm, inside pubescent in throat; lobes triangular, 2–3 mm, inside puberulent. Anthers included or exerted, 0.8–1 mm. Stigmas included or exerted, 0.5–1 mm. Fruit capsular, ellipsoid, 2–2.5 mm, crustaceous to cartilaginous, smooth, glabrous, septicidally then loculicidally dehiscent; seeds numerous, black, angled. Fl. Mar–Nov, fr. May–Jul.

• Dense forests or thickets on mountains; 100–300 m. Guangdong.

The circumscription here of this species and in particular its separation from *Hedyotis mellii* differs somewhat from that of some previous authors but provides a more consistent separation of it from *H. mellii* and *H. cantoniensis*.

39. *Hedyotis mellii* Tutcher, Rep. Bot. Dept. Hong Kong 1914: 32. 1915.

粗毛耳草 cu mao er cao

Hedyotis speciosa Handel-Mazzetti; *H. wulsinii* Merrill; *Oldenlandia mellii* (Tutcher) Chun.

Herbs, erect, perennial, to 90 cm tall; stems subterete to 4-angled, densely to sparsely hirtellous or pilosulous to sometimes glabrescent. Leaves sessile; blade drying papery, ovate-

lanceolate, elliptic, lanceolate, or narrowly elliptic, 3.5–9.5 × 0.5–3.5 cm, adaxially sparsely to densely puberulent or hispidulous or often glabrous on lamina, abaxially sparsely to densely hirtellous, pilosulous, or hispidulous to glabrous; secondary veins 3 or 4 pairs; stipules fused to petiole bases, triangular to broadly triangular, 1–3 mm, densely puberulent, hirtellous, or hispidulous to glabrescent, marginally entire to glandular-serrate, acuminate or with 3–5 narrowly triangular to linear lobes or bristles 0.2–2 mm. Inflorescences terminal and usually also in axils of uppermost leaves, cymose to compound-cymose, paniculate to often racemiform, 3–25 cm, several to many flowered, densely to sparsely pilosulous, puberulent, or hispidulous to glabrous; peduncle 0.5–7 cm; bracts narrowly elliptic to narrowly lanceolate, 1–5 mm; pedicels 1–5 mm. Flowers pedicellate, apparently monomorphic. Calyx glabrous or sparsely to densely hirtellous to pilosulous; hypanthium portion cupulate to obconic or elliptic, ca. 1 mm; limb 1–1.5 mm, lobed for 2/3–4/5; lobes ovate-lanceolate to narrowly triangular. Corolla presumably white, funnellform, outside glabrous to densely hirtellous or pilosulous, inside densely villosulous or tomentulose in throat and onto lobes; tube 2–2.5 mm; lobes lanceolate to spatulate, 4–4.5 mm, acute. Anthers shortly exerted, ca. 1.2 mm. Stigma long exerted, ca. 0.2 mm. Fruit capsular, ellipsoid to subglobose, 2–3 mm, sparsely to densely hirtellous, pilosulous, or glabrous, crustaceous to thickly papery or cartilaginous, septicidally then loculicidally dehiscent; seeds several, black, angled. Fl. Jun–Nov, fr. Aug–Nov.

• Jungles or thickets on mountains or mountain slopes; 400–1100 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi.

This species is very similar to *Hedyotis cantoniensis*, *H. matthewii*, and *H. tenuipes*, and these are here separated somewhat differently from the circumscriptions of FRPS (71(1): 48, 51, 52, 54. 1999). *Hedyotis matthewii* may be only a glabrous form of *H. mellii*, although they do appear to be distinct.

40. *Hedyotis merguensis* Benthham & J. D. Hooker, Gen. Pl. 2: 57. 1873.

合叶耳草 he ye er cao

Hedyotis connata J. D. Hooker, nom. illeg. superfl.; *H. coronaria* (Kurz) Craib; *H. coronata* Wallich ex J. D. Hooker & B. D. Jackson, nom. illeg. superfl.; *Oldenlandia connata* K. Schumann, nom. illeg. superfl.; *O. coronata* F. N. Williams, nom. illeg. superfl.; *Scleromitrium coronarium* Kurz.

Herbs, perennial or perhaps annual, procumbent; stems to 30 cm, weakly 4-angled to terete, sometimes sulcate, densely pilosulous or hispidulous just below nodes grading to glabrous at bases of internodes. Leaves sessile or subsessile; blade drying membranous or thinly papery, oblong-elliptic or oblong-lanceolate, 2.5–10 × 1–3 cm, glabrous except sometimes puberulent along midrib abaxially and/or scaberulous along margins, base obtuse to rounded, apex obtuse to acute; secondary veins 3–5 pairs; stipules fused to petiole bases, triangular to rounded, 3–4.5 mm, puberulent to glabrescent, ciliolate, with 5–7 linear lobes or bristles 2–12 mm. Inflorescences terminal and/or pseudoaxillary on short lateral stems, capitate, 1–1.5 cm in diam., several flowered, sessile, enclosed by stipules and leaf bases,

subtended by 2 or usually 4 leaves; bracts not seen. Flowers sessile or subsessile, apparently distylous. Calyx glabrous; hypanthium portion ellipsoid, ca. 2 mm; limb deeply lobed; lobes lanceolate, oblanceolate, or spatulate, 4–5 mm, distinctly veined, ciliolate. Corolla white tinged with pink or lilac, funnel-form, outside glabrous; tube 9–12 mm, pubescent in throat; lobes lanceolate to triangular, ca. 3 mm. Anthers 1–1.5 mm, exerted or included. Stigma 1–1.5 mm, exerted or included. Fruit indehiscent, ellipsoid to obovoid, 2.2–3 mm, papery, glabrous, with calyx lobes to 5.2 mm; seeds numerous, black, angled or ridged. Fl. [Aug–Oct in Thailand].

Bamboo forests, on rocks at streamsides; 600–1000 m. Hainan, Yunnan (Mengla) [India, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

The widely used name *Hedyotis coronaria* was synonymized with *H. merguensis* by Bakhuizen f. (Fl. Java 2: 286. 1965); this synonymy was accepted by Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) but overlooked by some other authors.

41. *Hedyotis minutopuberula* Merrill & F. P. Metcalf, J. Arnold Arbor. 23: 229. 1942.

粉毛耳草 fen mao er cao

Herbs or subshrubs, to 50 cm tall; stems terete, puberulent. Leaves petiolate; petiole 4–8 mm, puberulent; blade drying submembranous, ovate or elliptic-oblong, 4.5–5 × 0.7–2.5 cm, adaxially glabrous, abaxially glabrous or farinose pubescent, base cuneate or decurrent, apex acute or weakly acuminate; secondary veins ca. 3 pairs but indistinct; stipules ovate or lanceolate, 2–5 mm, marginally glandular-serrulate, long acuminate. Inflorescences terminal, cymose to paniculate, 1.5–4 × 2–4.5 cm; axes dichotomous to subumbelliform; bracts subulate, ca. 2 mm; pedicels ca. 1 mm. Flowers pedicellate. Calyx puberulent; hypanthium portion obovoid, ca. 1 mm; lobes lanceolate to narrowly triangular, 1.5–2.5 mm. Corolla purple, tubular-salverform, outside glabrous; tube ca. 6 mm, bearded in throat; lobes obovate to triangular, 1–1.2 mm. Anthers included. Fruit capsular, subglobose or obovate, ca. 2 × 1.5 mm, puberulent or subglabrous, dehiscent; seeds 2–4, black, angled. Fl. Apr–Jun.

• Jungles or thickets at low elevations or on slopes of low hills. Hainan.

42. *Hedyotis obliquinervis* Merrill, Lingnan Sci. J. 14: 56. 1935.

偏脉耳草 pian mai er cao

Hedyotis hedyotidea (Candolle) Merrill var. *obliquinervis* (Merrill) Fukuoka.

Shrubs or subshrubs, climbing to scandent, to 40 cm; stems terete to 4-angled, sometimes sulcate, densely villous and usually also hirtellous or villosulous. Leaves petiolate; petiole 1–5 mm, densely hirtellous or villosulous; blade drying papery, lanceolate, oblong-lanceolate, or lanceolate-elliptic, 3–8 × 0.8–2.5 cm, adaxially sparsely to moderately hispidulous and sometimes villosulous or villous on lamina and densely hispidulous on principal veins, abaxially moderately to densely hispidulous,

villosulous, or hirtellous with pubescence denser on principal veins, base cuneate to rounded, apex acute to acuminate; secondary veins 3–5 pairs; stipules fused to petiole bases, densely villous to villosulous, rounded, 1–4 mm, hispidulous, with 3–7 narrowly triangular to linear lobes or bristles 2–7 mm. Inflorescences terminal and sometimes also in axils of uppermost leaves, cymose to corymbiform-rounded, 2.5–9 × 4–16 cm, densely villous, villosulous, or hirtellous or sometimes glabrescent, pedunculate or sessile and tripartite; peduncles 1.5–5 cm; bracts linear-lanceolate to lanceolate, 0.5–4 mm; pedicels 1.5–3 mm. Flowers pedicellate, distylous. Calyx moderately to densely hirtellous or villosulous; hypanthium portion obconical, 1–1.5 mm; limb lobed nearly to base; lobes lanceolate to spatulate, 2–2.5 mm, sometimes reflexed. Corolla white or greenish white, funnel-form, outside subglabrous or hispidulous at least on upper part; tube 1–1.5 mm, bearded in throat; lobes lanceolate to spatulate, 2–2.5 mm. Anthers exerted or included, 0.8–1 mm. Stigmas included or exerted, 0.2–0.5 mm. Fruit capsular, compressed globose, ca. 2 mm in diam., hirtellous or villosulous, cartilaginous, septicidally then loculicidally dehiscent, beak rounded, ca. 0.6 mm high; seeds several, blackish brown, angled. Fl. Dec–Aug, young fr. Jun–Jul.

Broad-leaved forests, thickets on hills; 100–400 m. Hainan [S Vietnam].

This species is very similar to *Hedyotis ampliflora* and may be only a pubescent form of that species.

43. *Hedyotis ovata* Thunberg ex Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 29: 161. 1883.

卵叶耳草 luan ye er cao

Oldenlandia ovata (Thunberg ex Maximowicz) Kuntze.

Herbs or subshrubs, erect, perennial, to 90 cm tall; stems 4-angled, glabrous. Leaves petiolate; petiole ca. 5 mm, glabrous; blade drying papery, ovate, 2.5–7 × 1.5–3.5 cm, glabrous, base acute, margins revolute, apex acute; secondary veins 3 or 4 pairs but indistinct; stipules triangular to broadly triangular, ca. 2 mm, marginally glandular-serrulate. Inflorescences terminal and sometimes also in axils of uppermost leaves, fascicled, several flowered, sessile or pedunculate; peduncles 0.9–2 cm; bracts triangular, ca. 1.5 mm; pedicels 0.5–1 mm. Flowers subsessile to pedicellate. Calyx with hypanthium portion subglobose, 1–1.5 mm in diam.; lobes lanceolate, ca. 4 mm. Corolla purplish red, villosulous in throat and onto lobes; tube 3–4.5 mm. Anthers included. Stigmas included. Fruit capsular, subglobose, 3–4 mm in diam., septicidally then loculicidally dehiscent; seeds 3 or 4, 4-angled, smooth. Fl. and fr. Apr–Jul.

• On humid soil rich in humus in forests. Hainan (Sanya).

This species has been reported from Vietnam by the Kew Rubiaceae checklist (Govaerts et al., World Checkl. Rubiaceae; <http://www.kew.org/wcsp/rubiaceae/>; accessed on May 2007); it was not included in the Vietnam checklist.

44. *Hedyotis ovatifolia* Cavanilles, Icon. 6: 52. 1801.

矮小耳草 ai xiao er cao

Gonotheca ovatifolia (Cavanilles) Santapau & Wagh; *Oldenlandia nudicaulis* Roth; *O. ovatifolia* (Cavanilles) Candolle; *Thecagonum ovatifolium* (Cavanilles) Babu.

Herbs, erect, annual, to 15 cm tall; stems terete to 4-angled, often sulcate, densely villosulous, pilosulous, or puberulent with pubescence denser, longer, and apparently glandular on upper (i.e., distal) parts of internodes. Leaves sessile to usually petiolate, distributed along stem or those at uppermost 2 nodes clustered or apparently 4-verticillate especially at base of inflorescence; petiole 1–5 mm, densely puberulent to villosulous; blade drying membranous, elliptic or ovate, 1–6 × 0.7–3 cm, adaxially glabrous, abaxially puberulent or villosulous to glabrescent, base cuneate to rounded, apex acute to rounded; secondary veins 3–6 pairs; stipules fused to petiole bases, truncate to broadly rounded, 1–2.5 mm, pilosulous to glabrescent, arose to glandular-lacerate and usually also with 1–3 linear lobes to 1 mm. Inflorescence terminal, cymose to paniculate, 3–10 cm, glabrous, several to many flowered, pedunculate; peduncles 1–3, 1.5–4 cm, slender; axes mostly dichotomous; bracts triangular, 0.1–0.5 mm; pedicels 1–12 mm. Flowers pedicellate. Calyx glabrous; hypanthium portion subglobose, ca. 0.5 mm; limb lobed essentially to base; lobes triangular, 0.2–0.3 mm. Corolla white, tubular or salverform, outside glabrous; tube 1–1.5 mm, barbate in throat; lobes lanceolate, ca. 1 mm. Anthers exserted, ca. 0.2 mm. Stigma ca. 0.6 mm, exserted. Fruit capsular, compressed globose, 2–3 × 2–3 mm, glabrous, loculicidally dehiscent across top through beak, beak broadly rounded, to 0.3 mm high; seeds numerous, smooth. Fl. and fr. Jul–Aug.

Broad-leaved forests or grasslands on mountain slopes, sometimes on limestone rocks. Guizhou, Hainan, Taiwan, Yunnan [India, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand].

The measurements of several structures, in particular calyx, corollas, and anthers, given by Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) and also W. C. Ko (in FRPS 71(1): 71–72. 1999) do not agree with the specimens studied, nor with Dutta and Deb's own figure. The measurements in the description here are taken from specimens, which agree with Dutta and Deb's figure. All authors have found both the anthers and stigmas exserted (cf. Dutta & Deb figure; *Cooray 69011901R*, MO!) except Fl. Bhutan (2(2): 762–763. 1999), who found the anthers included.

45. *Hedyotis paridifolia* Dunn, Bull. Misc. Inform. Kew 1912: 366. 1912.

延龄耳草 *yan ling er cao*

Oldenlandia paridifolia (Dunn) Chun.

Herbs or subshrubs, perennial, erect, to 30 cm tall; stems green or purplish, flattened to subterete, usually sulcate along each side, glabrous. Leaves sessile to shortly petiolate, often clustered and apparently verticillate at tops of stems; petiole to 3 mm, glabrous; blade drying papery, ovate, elliptic, or elliptic-ovate, 7–9(–12) × 2.5–4.5 cm, glabrous, base obtuse to rounded and often decurrent, apex acute or shortly acuminate; secondary veins 5–7 pairs; stipules fused to petiole bases, triangular to broadly triangular, 1–3.2 mm, glabrous, sparsely glandular-serulate or glandular-setulose, apex with aristate projection 1–2 mm. Inflorescences terminal, capitate or subcapitate, hemi-

spherical, 1.5–2.5 cm in diam., glabrous, subsessile; bracts triangular, 1–2 mm; pedicels to 2.5 mm. Flowers shortly pedicellate to sessile, perhaps monomorphic. Calyx glabrous; hypanthium portion purple, turbinate, ca. 1 mm, puberulent; limb lobed nearly to base; lobes on a few flowers rarely 2 or 3, elliptic, elliptic-oblong, or lanceolate (i.e., narrowed at base), 2–4 mm, obtuse to acute. Corolla white, funnelform to tubular, outside glabrous; tube 4–5 mm, inside pilosulous in upper part and throat; lobes triangular, 1–1.2 mm. Anthers exserted, ca. 1 mm. Stigma exserted, ca. 1.2 mm. Fruit indehiscent, straw-yellow, obovoid or subellipsoid, 3–3.5 × 2–2.5 mm, glabrescent; seeds numerous, black, angled, foveolate. Fl. May–Nov, fr. Apr–May.

• Forests or thickets at middle elevations; ca. 200 m. Hainan.

W. C. Ko (in FRPS 71(1): 35. 1999) described the leaf blade as up to 12 cm, but this has not been seen on specimens studied and may include plants that have been subsequently separated as *Hedyotis baotingensis*.

46. *Hedyotis pinifolia* Wallich ex G. Don, Gen. Hist. 3: 526. 1834.

松叶耳草 *song ye er cao*

Oldenlandia pinifolia (Wallich ex G. Don) K. Schumann.

Herbs, annual or perennial, diffusely branched, to 25 cm tall; stems wiry, sharply 4-angled to subterete, sometimes sulcate, glabrous. Leaves sessile or subsessile, sometimes borne on very short axillary stems and appearing verticillate or clustered; blade drying stiffly papery to leathery, linear to narrowly spatulate, 5–25 × 0.8–2 mm, adaxially glabrous to densely scaberulous, abaxially glabrous, base straight to acute, margins markedly revolute at least when dry, apex acute; secondary veins not visible; stipules shortly fused to petiole bases, triangular to rounded, 0.8–1.2 mm, puberulent to glabrous, with 1–5 linear lobes or bristles 0.5–2.5 mm. Inflorescences terminal and pseudoaxillary on short axillary stems, capitate to shortly fasciculate, 4–7 mm in diam., (1 or) 3–10-flowered, sessile and subtended by 1 or 2 pairs of somewhat reduced leaves; bracts lanceolate to setose, 0.5–4 mm, entire to ciliate; pedicels to 1 mm. Flowers sessile, subsessile, or pedicellate, apparently homostylous. Calyx with hypanthium portion obconical to subglobose, 0.8–1.2 mm, glabrous to densely hispidulous; limb lobed for more than 1/2; lobes subulate to narrowly triangular, 1–2 mm, glabrescent, entire to densely ciliate. Corolla white sometimes flushed with pink, tubular to funnelform, outside glabrous; tube 3–4.2 mm, pubescent in throat; lobes spatulate-oblong to elliptic, 1.8–2 mm. Anthers exserted, ca. 1 mm. Stigma 0.5–1 mm, exserted and positioned above anthers. Fruit capsular, ovoid to lanceoloid, 2.5–3 × 1.5–2 mm, cartilaginous to stiff, loculicidal across top; seeds several to numerous, pale brown, angled. Fl. May–Nov, fr. Apr–Nov.

Open fields on hills, sandy wastelands at seashores or riversides; sea level to below 100 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

The plant illustrated in FRPS (71(1): 70, t. 13, f. 1–6. 1999) as "*Hedyotis umbellata*" is actually *H. pinifolia*. The Fl. Bhutan (2(2): 763–764. 1999) included this species noting that the report is based on a

published historical record that has not been re-confirmed.

47. *Hedyotis platystipula* Merrill, Philipp. J. Sci. 21: 510. 1922.

阔托叶耳草 *kuo tuo ye er cao*

Oldenlandia platystipula (Merrill) Chun.

Herbs or subshrubs, erect to perhaps weak, to 40 cm tall; stems flattened to 4-angled, sometimes sulcate, glabrous. Leaves petiolate; petiole 3–18 mm, glabrous; blade drying membranous, elliptic, oblong-ovate, or oblong-lanceolate, 5–12 × 2.5–4 cm, adaxially glabrous or rarely puberulent along principal veins, abaxially glabrous or papillose on principal veins, base cuneate to rounded and usually shortly decurrent, apex acute to shortly acuminate; secondary veins 4–6 pairs; stipules interpetiolar, reniform, ovate, or suborbicular, 5–10 mm, glabrous, broadly rounded to broadly triangular, fringed-lacerate or with numerous lobes or bristles 0.3–2 mm, usually glandular at apex. Inflorescence axillary, glomerate, subglobose, 1–2.5 cm in diam., glabrous, sessile; bracts not seen. Flowers sessile to subsessile, biology unknown. Calyx glabrous; hypanthium portion turbinate to ellipsoid, 1.2–2 mm; limb lobed essentially to base; lobes narrowly lanceolate to triangular, 4–6 mm, ciliate. Corolla white, tubular, outside glabrous; tube 6–7 mm, inside apparently glabrous; lobes lanceolate to triangular, 1.5–2 mm. Anthers ca. 2 mm, partially exerted. Stigmas ca. 1.5 mm, included. Capsules oblong-ellipsoid to obconic, 2–3 × 1.5–2 mm, somewhat flattened laterally, septically then loculicidally dehiscent; seeds ca. 10, black, scabrous. Fl. May–Aug, fr. Sep.

• Forests in valleys, on rocks at streamsides. Guangdong, Guangxi.

48. *Hedyotis prostrata* Blume, Catalogus, 40. 1823.

菲律宾耳草 *fei lu bin er cao*

Hedyotis congesta R. Brown ex G. Don; *H. laevigata* (Candolle) Miquel; *H. philippensis* (Willdenow ex Sprengel) Merrill ex C. B. Robinson; *Metabolos laevigatus* Candolle; *Oldenlandia congesta* (R. Brown ex G. Don) Kuntze (1891), not Baker (1877); *O. prostrata* (Blume) Kuntze; *Spermacoce philippensis* Willdenow ex Sprengel.

Herbs or subshrubs, erect to perhaps clambering, to 60 cm tall; stems 4-angled, flattened, or terete, sometimes sulcate, glabrous. Leaves petiolate; petiole 3–6 mm, glabrous; blade drying papery or membranous, ovate, lanceolate, ovate-lanceolate, or elliptic, 3.2–12 × 1.2–4.5 cm, glabrous, base cuneate, obtuse, or rounded then often decurrent, apex acute or acuminate; secondary veins 4–6 pairs but usually not visible; stipules shortly fused to petiole bases or around stem, broadly triangular, 2–4 mm, glabrous or pilosulous to hirtellous, acute or usually acuminate to aristate, entire or glandular-serrulate. Inflorescence axillary and/or terminal, capitate or glomerulate, 5–10 mm in diam., 10–18-flowered, glabrous, sessile or subsessile; bracts lanceolate, triangular, or linear, 0.5–4 mm. Flowers sessile to subsessile, floral biology unknown. Calyx glabrous; hypanthium portion obconic to campanulate, 0.8–1 mm; limb lobed essentially to base; lobes triangular, 1–1.2 mm. Corolla white to violet, funnelform; tube 2–3 mm; lobes lanceolate, 1–1.2 mm. Fruit inde-

hiscent or tardily septical, ellipsoid-oblong to subglobose, 2–4 × 1.5–3 mm, with pedicels to 2 mm; seeds 10–12, black, foveolate. Fl. Apr–Jun.

Thickets; 200–400 m. Hainan (Xinglong) [India, Indonesia, Philippines, Vietnam].

Plants from the Philippines have fruit that are markedly ellipsoid, but the Chinese plants treated under this name have subglobose fruit that are quite distinctively different in shape.

This species has long been treated under the name *Hedyotis philippensis*, based on the conclusion that Blume's valid publication of the name *H. prostrata* was in 1826 while the basionym of *H. philippensis* was published in 1825. However, Bakhuizen f. (Fl. Java 2: 284–288. 1965) noted that Blume's name was actually published in an earlier work and, thus, is the oldest name for this species. Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) treated this species under the name *H. congesta*, without explanation.

49. *Hedyotis pterita* Blume, Bijdr. 972. 1826–1827.

翅果耳草 *chi guo er cao*

Gonotheca blumei Candolle; *Hedyotis alata* Koenig ex Wight & Arnott; *Oldenlandia alata* (Koenig ex Wight & Arnott) J. D. Hooker; *O. pterita* (Blume) Miquel; *Thecagonum pteritum* (Blume) Babu.

Herbs, annual or perennial, at least weakly erect, to 15(–30) cm tall; stems subterete to 4-angled, sometimes sulcate and/or winged, glabrous. Leaves subsessile to petiolate; petiole to 10 mm, glabrous; blade drying membranous, elliptic-oblong, lanceolate, or elliptic, 1–6 × 0.4–1.5 cm, glabrous, base cuneate to obtuse then often abruptly decurrent, apex acute or obtuse; secondary veins indistinct; stipules fused to petiole bases, triangular, 0.5–2.5 mm, glandular-puberulent to glabrescent, apically truncate or serrulate to prolonged and acute. Inflorescences terminal becoming displaced to pseudoaxillary in upper leaf axils by subsequent stem growth, 1-flowered or 2–8-flowered and cymose to fasciculate, glabrous, subsessile or pedunculate; peduncle to 1.5 cm; bracts reduced, triangular, to 0.3 mm; pedicels to 1.5 mm, winged. Flowers subsessile to shortly pedicellate. Calyx glabrous; hypanthium portion cupular to turbinate, 1–2 mm, with 4 wings to 0.6 mm wide; limb lobed for 1/2–2/3 its length; lobes ovate, ca. 1 mm, reticulately veined, dorsally winged to apex, sometimes ciliolate, acute to acuminate. Corolla white, outside glabrous; tube 1–1.5 mm, barbate in throat; lobes triangular, 1–1.5 mm. Anthers ca. 0.5 mm, included and positioned near base of corolla tube. Fruit capsular, turbinate to ellipsoid, 5–8 × 3–5 mm, glabrous, with 4 wings to 1 mm wide; seeds numerous, ca. 0.5 mm. Fl. Jul–Oct.

Thickets, slightly shaded wastelands. Guangdong, Guangxi [India, Malaysia, Philippines, Thailand, Vietnam].

50. *Hedyotis pulcherrima* Dunn, Bull. Misc. Inform. Kew, Addit. Ser. 10: 127. 1912.

艳丽耳草 *yan li er cao*

Oldenlandia pulcherrima (Dunn) Chun.

Herbs or subshrubs, perennial, erect, to 30 cm tall; stems terete to slightly flattened, densely farinose puberulent. Leaves petiolate; petiole 0.15–0.6 cm, farinose puberulent; blade drying

papery, ovate, lanceolate-elliptic, or lanceolate, 0.8–5 × 0.5–2 cm, both surfaces glabrous or puberulent on midrib, base obtuse to rounded, margins plane to revolute, apex obtuse to acute; secondary veins 3 or 4 pairs but mostly indistinct; stipules fused to petiole bases, broadly triangular to broadly rounded, 1–2 mm, densely farinose puberulent, ciliolate-serrulate, apically sometimes with obtuse to shortly apiculate protuberance. Inflorescences terminal and in axils of uppermost leaves, 1-flowered or 2–4-flowered and fasciculate, densely puberulent, pedunculate; peduncles 2–6 mm, often articulate above middle; bracteoles lanceolate or spatulate, 0.5–2 mm. Flowers pedunculate. Calyx glabrous; hypanthium portion turbinate to ellipsoid, ca. 1.2 mm; limb lobed nearly to base; lobes narrowly lanceolate to narrowly spatulate, 3–3.5 mm. Corolla pale purple, funnellform, outside glabrous; tube 12–13 mm, pubescent in throat; lobes spatulate-oblong to ovate, 4–6 mm. Anthers in apparent short-styled form included or partially exerted, ca. 2 mm. Stigmas included, positioned near middle of corolla tube, ca. 2.3 mm. Fruit capsular, ovoid or obovoid, ca. 2.5 mm, crustaceous to cartilaginous, outside glabrescent, septicidally then loculicidally dehiscent; seeds several. Fl. Jun–Jul, fr. Apr.

- Open fields at roadsides. Guangdong (Raoping).

51. *Hedyotis scandens* Roxburgh, Fl. Ind. 1: 369. 1820.

攀茎耳草 pan jing er cao

Oldenlandia scandens (Roxburgh) Kuntze.

Shrubs or herbs, perennial, lianescent, climbing, or scandent, to several meters; stems compressed terete to angled, smooth or sulcate, glabrous or puberulent in lines. Leaves sessile to petiolate; petiole to 5 mm, glabrous; blade drying papery to subleathery, pale abaxially, oblong-lanceolate, elliptic, narrowly elliptic, or elliptic-oblong, 5–10 × 1.5–4 cm, glabrous, base acute to cuneate then decurrent, apex long acuminate; secondary veins 3–5 pairs but not evident; stipules fused to petiole bases, truncate to triangular, 2.5–4 mm, glabrous to usually puberulent or strigillose, ciliolate to entire, apex acute to acuminate or bilobed, sometimes glandular and/or with bristle inserted below top of stipule. Inflorescences terminal and usually also in axils of uppermost leaves, cymose to compound-cymose, 2–15 cm, densely pilosulous or hirtellous, pedunculate; peduncles 2–3 cm; bracts triangular to narrowly triangular, 0.3–6 mm; pedicels 1–3 mm. Flowers pedicellate, distylous. Calyx glabrous; hypanthium portion obconical, ca. 1 mm, sometimes ridged; limb 1–2 mm, lobed for 1/3–1/2, lobes triangular and thickened, sometimes costate. Corolla white or yellow, tubular-funnelform to funnellform, outside glabrous [or puberulent in India], inside densely villous in throat and throughout lobes; tube 1–2 mm; lobes narrowly spatulate-oblong to narrowly triangular, 3–4 mm, acute. Anthers shortly to long exerted, ca. 1.2 mm. Stigmas 0.3–1 mm. Fruit capsular, subglobose, ellipsoid, or ovoid, 3–5 × 3–5 mm, glabrous, cartilaginous to stiffly papery, loculicidally dehiscent across top then sometimes septicidal, beak rounded to conical, 1.2–2 mm; seeds several, black, angled. Fl. Jul–Sep, fr. Aug–Sep.

Sparse forests, on humid soil in valleys; 1000–1800 m [as low as ca. 700 m in India]. Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Vietnam].

52. *Hedyotis shenzhenensis* Tao Chen, Edinburgh J. Bot. 64: 331. 2007.

深圳耳草 shen zhen er cao

Herbs, perennial, erect, to 40 cm tall; stems glabrous. Leaves subsessile; blade drying subleathery, adaxially dark green, abaxially pale green, elliptic, elliptic-oblong, or obovate, 8.5–15 × 5–9 cm, glabrous, base cuneate to rounded or cordulate, apex acute to obtuse; secondary veins 4–6 pairs but rather indistinct; stipules fused to leaf bases or very shortly around stem, triangular, 3–5 mm, shortly pubescent, ciliolate, acute. Inflorescence terminal, paniculate, many flowered, branched to several orders, glabrous, flushed with purple; peduncle 10–18 cm; axes flattened to 4-angled; bracts narrowly triangular, 0.2–3 mm; pedicels to 2 mm. Flowers sessile and/or pedicellate, distylous. Calyx glabrous; hypanthium portion obconic, ca. 1 mm; limb deeply lobed; lobes narrowly triangular to ovate, ca. 1.5 mm. Corolla white, tubular-urceolate, glabrous outside; tube ca. 3 mm, villous from middle into throat; lobes ovate to elliptic-triangular, 1.8–2.5 mm. Anthers included or exerted, 0.6–0.8 mm. Stigma included or exerted, ca. 1 mm. Fruit capsular, subglobose, ca. 2 mm, glabrous, weakly ribbed, septicidally dehiscent; seeds numerous, black, irregularly angled. Fl. Apr–Jun, fr. May–Oct.

- Understories of broad-leaved forests; 400–700 m. Guangdong (Shenzhen).

This species was treated by Chen (in T. L. Wu, Check List Hong Kong Pl. 265–266. 2002) under the name *Hedyotis yangchunensis*. The flower sizes in the figure in the protologue, according to the scale in that figure, do not precisely agree with the measurements given in the protologue description.

53. *Hedyotis strigulosa* (Bartling ex Candolle) Fosberg, Smithsonian Contr. Bot. 45: 28. 1980.

肉叶耳草 rou ye er cao

Oldenlandia strigulosa Bartling ex Candolle, Prodr. 4: 427. 1830; *Hedyotis coreana* H. Léveillé; *H. taiwanensis* S. F. Huang & J. Murata [“*taiwanense*”]; *Thecagonum strigulosum* (Bartling ex Candolle) Terrell & H. Robinson.

Herbs, annual or perennial, prostrate to erect, to 15(–20) cm tall; stems terete or weakly to sharply 4-angled, sometimes sulcate, glabrous. Leaves sessile; blade very fleshy, drying leathery, oblong-obovate, elliptic-oblong, oblanceolate, or spatulate, 1–2.5 × 0.2–1 cm, glabrous, base acute to decurrent, apex rounded, obtuse, or acute; secondary veins indistinct; stipules fused to petiole bases, triangular, 1–2 mm, glabrous, with 2 central longitudinal lines of glandular trichomes or fleshy ornamentation, acute to acuminate. Inflorescences terminal and sometimes in axils of uppermost leaves, 1-flowered or 2–12-flowered and shortly cymose, fasciculate, or paniculate, glabrous, subsessile to pedunculate; peduncles to 1.5 cm; bracts triangular, 0.1–2 mm; pedicels 1–12 mm. Flowers pedicellate. Calyx glabrous; hypanthium portion turbinate to ellipsoid, 1–1.5 mm; limb lobed for 1/2–2/3; lobes triangular to lanceolate, 0.8–2 mm. Corolla white, tubular, glabrous outside; tube 1.2–1.5 mm, barbate in throat; lobes triangular to oblanceolate, 1.2–2 mm.

Anthers not seen. Stigmas ca. 0.8 mm, exserted. Fruit capsular, subglobose, hemispherical, or compressed turbinate, 3.5–5 mm, glabrous, loculicidal across top, sometimes with rudimentary beak; seeds numerous, blackish brown, subglobose to angled, foveolate. Fl. and fr. Dec–Apr.

Sandy or muddy beaches, wastelands, on rocks near sea; sea level to near sea level. Guangdong, Taiwan, Zhejiang [Japan, Korea; Micronesia].

Hedyotis taiwanensis was treated as a species separate from *H. coreana* by W. C. Ko (in FRPS 71(1): 39, 73. 1999), and the name *H. strigulosa* was not cited by her. However, *H. coreana* was synonymized under *H. strigulosa* by Fosberg (loc. cit.), though provisionally. *Hedyotis taiwanensis* was synonymized with *H. strigulosa* by Fl. Taiwan (ed. 2, 4: 268. 1998). The Fl. Taiwan separated *Hedyotis strigulosa* from *H. biflora* based on the stoutness of the pedicels and fleshiness of the leaves, but different characters are used here and most of the specimens included by them in *H. strigulosa* are here included in *H. biflora*.

The Fl. Taiwan and Fl. Japan (3a: 217. 1993) included the Chinese plants in *Hedyotis strigulosa* var. *parvifolia* (Hooker & Arnott) T. Yamazaki (J. Jap. Bot. 58: 284. 1983). This name was not mentioned by W. C. Ko (loc. cit.) and was synonymized with *H. strigulosa* by the Kew Rubiaceae checklist (Govaerts et al., World Checkl. Rubiaceae; <http://www.kew.org/wcsp/rubiaceae/>; accessed on May 2007), though without any source or explanation. The basionym of this name is *H. biflora* var. *parvifolia* Hooker & Arnott (Bot. Beechey Voy. 264. 1838). *Hedyotis biflora* var. *parvifolia* was reported from Zhejiang (Qiu & Zhong, Fl. Zhejiang 6: 121–122. 1986), but that report is here interpreted as *H. strigulosa*.

54. *Hedyotis tenelliflora* Blume, Bijdr. 971. 1826–1827.

纤花耳草 xian hua er cao

Hedyotis angustifolia Chamisso & Schlechtendal; *Oldenlandia angustifolia* (Chamisso & Schlechtendal) Benthams; *O. tenelliflora* (Blume) Kuntze; *Scleromitron angustifolium* (Chamisso & Schlechtendal) Benthams; *S. sinense* Miquel.

Herbs, annual or perennial, diffusely branched, to 40 cm tall, often drying blackened; stems subterete and smooth or weakly to sharply 4-angled and/or 2-sulcate, glabrous or often scaberulous along grooves and/or near nodes. Leaves sessile or subsessile; petiole to 1 mm, glabrescent; blade drying thinly leathery, linear, linear-lanceolate, narrowly elliptic-oblong, or narrowly spatulate, 1.2–5 × 0.15–0.4 cm, adaxially glabrous or scaberulous near margins, abaxially glabrous, both surfaces sometimes apparently scaly due to collapsed large epidermal cells, base cuneate, acute, or decurrent, margins frequently revolute, apex acute or acuminate; secondary veins not visible; stipules fused to petiole bases, triangular to rounded, 1–2 mm, puberulent, hispidulous, or glabrescent, with 2–5 linear or setiform lobes 1–4 mm. Inflorescences axillary, 1-flowered or 2- or 3-flowered in each axil, congested-cymose, glomerulate, or fasciculate, 4–8 mm in diam., sessile to subsessile; bracts acicular to lanceolate, 1–2.5 mm, entire or marginally scaberulous; pedicels to 1 mm. Flowers sessile to subsessile, apparently homostylous. Calyx glabrous; hypanthium portion subglobose to obovoid, ca. 1 mm; limb lobed nearly to base; lobes linear-lanceolate, triangular, or spatulate, 1.5–2 mm, ciliolate. Corolla white, funnelform, outside glabrous; tube ca. 2 mm, pubescent in throat; lobes narrowly spatulate-oblong, 1–2 mm. Anthers

exserted, ca. 1 mm. Stigma 0.2–0.3 mm. Fruit capsular, ovoid, 2–2.5 × 1.5–2 mm, cartilaginous to stiff, loculicidal across top; seeds numerous. Fl. and fr. Apr–Dec.

Slopes in valleys, ridges of fields; 100–1400 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Philippines, Thailand, Vietnam; Australia, Melanesia].

This species has been treated by most authors as *Hedyotis tenelliflora*; however, Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) considered that a distinct species and treated these plants as *H. angustifolia*. Unfortunately, they presented no discussion of this situation nor details of the actual identity and range of “true” *H. tenelliflora*; consequently, their conclusion is not yet accepted here.

W. C. Ko (in FRPS 71(1): 41. 1999) described the leaves as densely rotund transparent scaly, which apparently refers to the relatively large epidermal cells that are visible under magnification and sometimes apparently collapse. This character was noted in the Fl. Bhutan (2(2): 757–764. 1999) for several *Hedyotis* species.

The name *Scleromitron sinense* is here provisionally placed in synonymy with *Hedyotis tenelliflora*. As detailed by Sivarajan and Nair (Taxon 35: 363–369. 1986), the name *Spermacoce stricta* Linnaeus f. has also been considered by some authors to apply to *H. tenelliflora* (in which case it would have priority), but the identity of that *Spermacoce* name is so unclear and controversial, as well as involving plants from our flora area, that it is better left aside for now. Other authors have suggested that *S. stricta* is actually a synonym of *H. verticillata*.

55. *Hedyotis tenuipes* Hemsley, J. Linn. Soc., Bot. 23: 375. 1888.

细梗耳草 xi geng er cao

Oldenlandia tenuipes (Hemsley) Kuntze.

Herbs or subshrubs, erect, perennial, to 50 cm tall; stems terete to weakly 4-angled, often flexuous, puberulent to glabrous. Leaves subsessile to petiolate; petiole to 2(–6) mm; blade drying papery, usually clear green, narrowly lanceolate, lanceolate, ovate, or lanceolate-elliptic, 2.5–9 × 0.7–3 cm, both surfaces glabrous except densely puberulent on midrib adaxially, base cuneate to rounded, apex acute to acuminate; secondary veins 3 or 4 pairs but usually indistinct; stipules fused to petiole bases, triangular, ovate, or subtruncate, 1–3 mm, densely puberulent, acute to acuminate, marginally entire, serrulate, or occasionally glandular-erose. Inflorescences terminal and often axillary and/or pseudoaxillary in uppermost leaf axils, cymose to paniculate, 4–18 cm, glabrous, several to many flowered, pedunculate; peduncle 0.5–2 cm; axes slender, flexuous, spreading at up to 90°; bracts linear to narrowly triangular, 1–5 mm; pedicels 4–15 mm. Flowers all pedicellate, apparently monomorphic. Calyx glabrous; hypanthium portion turbinate to ellipsoid, 1–1.5 mm; limb lobed for 2/3–3/4; lobes narrowly triangular to lanceolate, 1–1.5 mm. Corolla white, sometimes tinged pink to purple, funnelform, outside glabrous, inside densely barbate in throat and throughout lobes; tube 1.5–3 mm; lobes lanceolate to spatulate, 3–4 mm, acute to acuminate. Anthers partially to fully exserted, ca. 1.5 mm. Stigma 0.1–0.2 mm, exserted by 3–4 mm. Fruit capsular, ovoid to ellipsoid, 2–2.5 mm, glabrous, smooth, septically then loculicidally dehiscent; seeds numerous, black, angled. Fl. Jun–Aug, fr. Jun–Nov.

• Sandy lands, barren soil in sparse forests; 200–1000 m. Fujian, Guangdong, Hainan.

This species is similar to *Hedyotis matthewii* and *H. mellii* and is perhaps separated here somewhat differently from other authors (e.g., W. C. Ko in FRPS 71(1): 52. 1999). The pedicel measurements here are for flowers at anthesis and fruit; the pedicels subtending flower buds are much shorter and apparently elongate rapidly as the buds mature.

56. *Hedyotis terminaliflora* Merrill & Chun, Sunyatsenia 2: 326. 1935.

顶花耳草 ding hua er cao

Herbs or subshrubs, perennial, erect, to 100 cm tall; stems terete, flattened or weakly 4-angled, 2- or 4-sulcate, glabrescent or sparsely to densely strigillose to hirtellous throughout or in lines along grooves. Leaves petiolate; petiole 1–4 mm, densely puberulent, strigillose, or glabrescent; blade drying papery or subleathery, a bit fragile, ovate, oblong-ovate, lanceolate, or oblong-lanceolate, 2.2–8 × 1–3 cm, adaxially glabrous and shiny, abaxially sparsely to densely puberulent to strigillose, base obtuse to rounded, apex acute to shortly acuminate; secondary veins 2–4 pairs; stipules shortly fused to petiole bases, ovate, triangular, or narrowly triangular, 2–5 mm, glabrous to densely puberulent or strigillose, lacinate or glandular-setose. Inflorescence terminal, subcapitate, hemispherical to subglobose, 1.5–1.8 cm in diam., glabrescent, sessile or subsessile; bracts narrowly lanceolate to narrowly triangular, 1–5 mm; pedicels to 2 mm. Flowers sessile to pedicellate. Calyx glabrescent; hypanthium portion cylindrical, ca. 1 mm; limb deeply lobed; lobes narrowly spatulate-oblong, narrowly triangular, or narrowly elliptic, 3–4 mm, sometimes unequal, usually ciliate. Corolla funnellform, outside glabrous; tube ca. 3.5 mm, barbate in throat; lobes triangular, ca. 2.5 mm. Anthers exerted, ca. 1 mm. Stigmas not seen. Fruit capsular, subglobose to ellipsoid, ca. 2.5 mm in diam., glabrescent, cartilaginous, septicidally dehiscent then quickly loculicidal; seeds several, black, angled. Fl. Feb–Mar, fr. Aug–Nov.

• Broad-leaved forests on mountaintops; 600–1100 m. Hainan.

Broader morphological variation is included in this species here than in the original species circumscription, based on study of specimens. This is the first description of the corolla; it is based on *Liu Qinqiu* 25932 (MO).

57. *Hedyotis tetragonalis* (Korthals) Walpers, Ann. Bot. Syst. 2: 769. 1852.

方茎耳草 fang jing er cao

Diplophragma tetragonale Korthals, Ned. Kruidk. Arch. 2: 149. 1851 [“*tetragonalis*”]; *Hedyotis parryi* Hance; *H. quadrangularis* Miquel; *Oldenlandia parryi* (Hance) Kuntze; *O. quadrangularis* (Miquel) Kuntze.

Herbs or subshrubs, erect, perennial or perhaps sometimes annual, to 50 cm tall; stems subterete to 4-angled with angles thickened to ridged, glabrous. Leaves sessile; blade drying papery, linear, linear-lanceolate, narrowly elliptic, or narrowly elliptic-oblong, 1–3.5 × 0.2–0.55 cm, glabrous, base acute to obtuse and usually decurrent, margins usually revolute, apex acute; secondary veins not visible; stipules shortly fused to peti-

ole bases, triangular to truncate, 1–1.5 mm, glabrous, rounded to acute or usually with leaflike appendage, this narrowly elliptic to lanceolate, 2–10 mm, entire or shortly 2- or 3-lobed or -setose. Inflorescences terminal and sometimes in axils of uppermost leaves, compound-cymose to paniculate, 4–13 cm, glabrous, many flowered, pedunculate; peduncle 1–5.5 cm; axes mostly regularly dichotomous; bracts linear, 1–2.5 mm; pedicels (or ultimate inflorescence axes) 0.5–3 mm. Flowers subsessile or pedicellate, apparently distylous. Calyx glabrous; hypanthium portion turbinate, 0.8–1 mm; limb lobed nearly to base; lobes narrowly lanceolate to narrowly triangular, 1–1.5 mm. Corolla white, tubular or tubular-funnelform, outside glabrous, inside tomentose at throat and onto lobes; tube ca. 2 mm; lobes lanceolate-oblong, ca. 2 mm. Anthers included or exerted, 0.8–1 mm. Stigmas 0.8–1 mm, included or exerted. Fruit capsular, subglobose, sometimes slightly didymous, ca. 2 × 2 mm, glabrous, septicidally then loculicidally dehiscent; seeds several, black, angled. Fl. and fr. Jul–Nov.

Open fields, grassy slopes, sometimes on ridges of farmlands; low elevations. Guangdong, Guangxi [Borneo, Cambodia, Indonesia, Malaysia, Thailand, Vietnam].

Merrill and Metcalf (Lingnan Sci. J. 16(3): 400. 1937) noted that Valeton provided a much-expanded and detailed description of this species (Bot. Jahrb. Syst. 44: 543. 1910), and they formally synonymized *Hedyotis parryi* with *H. tetragonalis*, though as “*tetragonalis*.”

58. *Hedyotis trinervia* (Retzius) Roemer & Schultes, Syst. Veg. 3: 197. 1818.

三脉耳草 san mai er cao

Oldenlandia trinervia Retzius, Observ. Bot. 4: 23. 1786; *Hedyotis rotundifolia* Sprengel, nom. illeg. superfl.

Herbs, annual, prostrate to weakly erect, to 15 cm tall; stems 4-angled to 4-winged, hirsute to pilose. Leaves subsessile to petiolate; petiole to 2 mm, pilose to hirsute; blade drying papery, ovate, elliptic, or suborbicular, 0.3–1.2 × 0.6–1 cm, adaxially glabrous, abaxially glabrous or sparsely strigillose to hispid, base obtuse and shortly decurrent, margins usually ciliate, apex obtuse and shortly acuminate; secondary veins 2 or 3 pairs; stipules fused to petiole bases, hispidulous to villosulous, truncate, ca. 0.5 mm, irregularly erose and with 1–3 narrowly triangular to linear lobes or bristles 0.3–1 mm. Inflorescences axillary, 1-flowered to 2–4-flowered and cymose or fasciated, pilose, subsessile; pedicels to 1.5 mm. Flowers subsessile to pedicellate. Calyx pilosulous to hispidulous; hypanthium portion subglobose, ca. 1 mm; limb lobed nearly to base; lobes triangular, 1–1.2 mm. Corolla white, rotate, apparently glabrous; tube ca. 0.5 mm; lobes 1–2 mm. Anthers exerted or included, 0.5–1 mm. Stigmas included. Fruit capsular, subglobose, somewhat didymous, 1–2 × 1–1.5 mm, pilosulous or hispidulous, loculicidally dehiscent across top; seeds several, black, angled. Fl. and fr. Oct–Mar.

Sparse forests on mountains. Hainan (Ledong) [India, Indonesia, Malaysia, Sri Lanka, N Vietnam].

The descriptions seen suggest that this is a rather distinctive species. The description here is compiled from Dutta and Deb (Taxon. Rev. *Hedyotis*. 2004) and Augustine (J. Econ. Taxon. Bot. 26: 91.

2002).

The synonym *Hedyotis rotundifolia* was attributed by W. C. Ko (in FRPS 71(1): 76. 1999) to Candolle, but Candolle clearly indicated (Prodr. 4: 420. 1830) that Sprengel was the author of the name. W. C. Ko gave the range of this species as including “Tropical Africa,” but Verdcourt (Fl. Trop. E. Africa, Rub. (Pt. 1), 279–280. 1976) noted that throughout Africa this name was long incorrectly applied to *Oldenlandia gorensis* (Candolle) Summerhayes (= *H. gorensis* Candolle); thus, *H. trinervia* is not currently known from Africa.

59. *Hedyotis uncinella* Hooker & Arnott, Bot. Beechey Voy. 192. 1833.

长节耳草 chang jie er cao

Hedyotis borrierioides Champion ex Bentham; *H. kuraruenensis* Hayata; *H. uncinella* var. *cephalophora* Craib; *Oldenlandia uncinella* (Hooker & Arnott) Kuntze.

Herbs, perennial, erect, to 70 cm tall; stems 4-angled and/or sulcate, angles becoming sharp and thickened or narrowly winged, sparsely to densely puberulent or hispidulous to glabrescent. Leaves opposite or rarely ternate at 1 or 2 nodes, subsessile to petiolate; petiole to 2.5 mm, puberulent to glabrescent; blade drying papery, ovate-oblong, oblong-lanceolate, ovate, lanceolate, or elliptic, 1.5–7.5 × 0.4–3.8 cm, both surfaces sparsely to densely puberulent, hispidulous, or pilosulous, base acute to rounded and usually shortly decurrent, apex acute to acuminate; secondary veins 4 or 5 pairs; stipules interpetiolar, triangular to narrowly triangular, 2–3.5 mm, moderately to densely pilosulous, pilosulous, or puberulent, acute, aristate, or usually lacinate or with 2–5 linear lobes or bristles 0.5–2 mm. Inflorescences terminal and axillary in axils of uppermost leaves, capitate or glomerulate, 8–15 mm in diam., globose, many flowered, sessile; bracts linear to lanceolate, 0.5–2 mm. Flowers sessile or subsessile, distylous. Calyx moderately to densely pilosulous to hispidulous; hypanthium portion subglobose to obconic, ca. 1 mm; limb lobed essentially to base; lobes narrowly triangular, 2.5–4 mm, ciliolate. Corolla white or purple, funnellform or tubular-funnelform, outside puberulent or pilosulous at least on lobes; tube 3–3.5 mm, tomentose in throat; lobes oblong-lanceolate, 1.5–2 mm. Anthers exerted or included, 0.8–1 mm. Stigma 0.3–1 mm, included or exerted. Fruit capsular, subglobose to broadly ovoid, 1.5–2 × 1.8–2 mm, often somewhat compressed, septically dehiscent then loculicidal, with stipes or pedicels to 1 mm; seeds several, pale brown, angled. Fl. and fr. Apr–Sep.

Dry open fields; 200–1200 m. Fujian, Guangdong, Guizhou, Hainan, Hunan, Taiwan [India, Myanmar].

The name *Hedyotis uncinella* var. *cephalophora* has been cited as a combination by some authors, but the basionym cited for it, “*H. cephalophora* R. Brown,” is apparently a nomen nudum.

W. C. Ko (in FRPS 71(1): 60. 1999) described the anthers as ca. 3 mm, which has not been reported by any other authors nor seen on any specimens.

60. *Hedyotis vachellii* Hooker & Arnott, Bot. Beechey Voy. 194. 1837.

香港耳草 xiang gang er cao

Oldenlandia vachellii (Hooker & Arnott) Kuntze.

Herbs or subshrubs, erect, to 40 cm tall; stems terete, weakly angled, or flattened, glabrous. Leaves subsessile to petiolate; petiole to 8 mm, glabrous; blade drying papery to subleathery, oblong-lanceolate, elliptic, lanceolate, or elliptic-oblong, 4–8.5 × 1–3.5 cm, glabrous, base acute to usually cuneate or obtuse, apex acute; secondary veins indistinct; stipules perhaps interpetiolar or shortly fused around stem, triangular to ovate, 1.5–2 mm, marginally densely glandular-ciliolate, acute to obtuse. Inflorescences terminal, paniculate, cymose, multichotomous, 4–8 × 3.5–8 cm, many flowered, glabrous, purple, pedunculate; peduncles 2–4.5 cm; principal lateral axes 0.8–1.5 cm; bracts lanceolate to narrowly triangular, 0.5–3 mm; pedicels to 1.5 mm. Flowers subsessile to pedicellate, floral biology unknown. Calyx glabrous, somewhat succulent; hypanthium portion turbinate to ellipsoid, 0.9–1 mm; limb lobed essentially to base; lobes lanceolate to narrowly triangular, 1.2–2 mm. Corolla white to pale green, salverform, outside glabrous; tube 2.5–3 mm, sparsely pubescent inside; lobes ovate-triangular, ca. 2 mm. Anthers exerted, ca. 1.2 mm. Stigma included. Fruit capsular, subglobose, ca. 1.8 mm in diam., dehiscent; seeds several, brown. Fl. Apr–Aug.

• Hong Kong (New Territories).

61. *Hedyotis verticillata* (Linnaeus) Lamarck, Tabl. Encycl. 1: 271. 1792.

粗叶耳草 cu ye er cao

Oldenlandia verticillata Linnaeus, Mant. Pl. 1: 40. 1767; *Hedyotis hispida* Retzius; *O. hispida* (Retzius) Poiret.

Herbs, annual or perennial, diffusely branched, often decumbent, to 30 cm tall; stems flattened, subterete, or 4-angled and/or usually 2-sulcate, sparsely to densely hirtellous, hispidulous, and/or scaberulous. Leaves sessile to petiolate; petiole to 2 mm, scaberulous or hispidulous to glabrescent; blade drying papery or thinly leathery, narrowly elliptic or linear-lanceolate, 2.5–6 × 0.3–1.3(–2) cm, adaxially glabrous or scaberulous at least near margins, abaxially glabrous to densely hirtellous or hispidulous at least on midrib, base acute to obtuse, margins often revolute at least when dry, apex acute or acuminate; secondary veins not visible; stipules shortly fused to petiole bases, triangular to subtruncate, 1–3 mm, sparsely to densely hispidulous to hirtellous, with 5–9 linear lobes or bristles 1–8 mm. Inflorescences axillary, glomerulate to congested-cymose, 5–10 mm in diam., several flowered, moderately to densely hispidulous, sessile; bracts linear to lanceolate, 1–4 mm. Flowers sessile to subsessile, apparently homostylous (e.g., *Anon. 788*, MO). Calyx densely hispidulous; hypanthium portion obconical to subglobose, ca. 1 mm; limb lobed essentially to base; lobes lanceolate to triangular, 1–2 mm, ciliolate. Corolla white, funnellform, outside glabrous except lobes sometimes bearded at apex; tube ca. 2 mm, glabrous inside; lobes lanceolate, 1.8–2 mm. Anthers exerted, ca. 1 mm. Stigma ca. 0.3 mm. Fruit capsular, ovoid, 2–3 × 1.5–2 mm, loculicidal across top, with calyx lobes to 3 mm, with petioles to 1.5 mm; seeds numerous, pale brown, angled. Fl. and fr. Mar–Nov.

Tussocks or thickets on foothills, roadsides, sparse forests; 200–

1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Philippines, Singapore, Thailand, Vietnam].

As noted under *Hedyotis tenelliflora*, *Spermacoce stricta* may be a synonym of *H. verticillata*.

W. C. Ko (in FRPS 71(1): 42. 1999) described the leaves as up to 2 cm wide; this has not been reported by other authors nor seen on any specimens.

62. *Hedyotis vestita* R. Brown ex G. Don, Gen. Hist. 3: 526. 1834.

脉耳草 mai er cao

Hedyotis capituliflora Miquel; *H. costata* (Roxburgh) Kurz (1876), not R. Brown ex G. Don (1834); *Metabolos lineatus* Bartling ex Candolle; *Spermacoce costata* Roxburgh.

Herbs, annual or perennial, diffusely branched, weak to clambering or prostrate, to 60 cm tall; stems flattened, 4-angled, or subterete, sometimes sulcate, densely villous or hirsute with trichomes drying golden yellow. Leaves subsessile to petiolate; petiole 1–10 mm, densely hirtellous to villous; blade drying membranous to papery, lanceolate, elliptic-lanceolate, or elliptic, 2–8 × 0.5–3 cm, adaxially sparsely to densely strigose and/or strigillose to hirsute on lamina and moderately to densely pilosulous on principal veins, abaxially sparsely strigillose to glabrescent on lamina and densely strigose to hirsute on principal veins, base cuneate to obtuse and frequently decurrent, apex acute to usually acuminate; secondary veins 4–6 pairs; stipules fused to petiole bases, truncate to triangular, 2–4 mm, moderately to densely hirtellous, hirsute, or villous, with 3–5 linear or setose lobes 2–5 mm. Inflorescences axillary, congested-cymose, capitate, or fasciculate, 5–20 mm, densely hirtellous to hirsute, several to many flowered, pedunculate; peduncles 1–3 per leaf axil, 2–12 mm; bracts subulate, to 1 mm. Flowers sessile or subsessile, distylous. Calyx densely hirtellous to villosulous; hypanthium portion turbinate to obconic, ca. 0.5 mm; limb lobed nearly to base; lobes lanceolate to triangular, 0.3–1 mm. Corolla white or purple, tubular to funnel-form, outside puberulent to pilosulous; tube 1.2–1.5 mm, pubescent in throat; lobes narrowly elliptic to triangular, 0.8–1.2 mm. Anthers 0.5–1 mm, exerted. Stigma 0.3–0.6 mm, exerted. Fruit indehiscent, subglobose, 0.8–1.5 mm in diam., pilosulous; seeds 6–8, black, trigonous. Fl. and fr. Jul–Nov.

Forest margins in valleys, open fields, grassy slopes; 400–2000 m. Guangdong, Guangxi, Hainan, Yunnan [India, Indochina, Indonesia, Malaysia, Philippines, Thailand].

This species has been treated by many previous authors under the name *Hedyotis costata*; the basionym of that name, *Spermacoce costata* Roxburgh, is indeed the oldest name for this species, but that epithet was previously occupied for another species in *Hedyotis* when Kurz published his name and, thus, was blocked from transfer.

63. *Hedyotis wangii* R. J. Wang, Acta Phytotax. Sin. 41: 85. 2003.

启无耳草 qi wu er cao

Herbs, annual or perennial, to 6 cm tall; stems glabrous. Leaves petiolate; petiole 3–6 mm; blade drying papery, elliptic-

oblong or ovate-elliptic, 3–5 × 1.5–2.3 cm, glabrous, base obtuse, apex acute; secondary veins ca. 5 pairs; stipules broadly rounded, ca. 0.5 mm, with 3 or 4 linear to narrowly triangular lobes or bristles ca. 2 mm. Inflorescence terminal, capitate or subcapitate, pedunculate; peduncle ca. 1.7 cm; head solitary, ovoid, ca. 0.5 cm, 4- or 5-flowered; bracts linear-lanceolate, ca. 3 mm. Flowers sessile. Calyx sparsely hirtellous or pilosulous or perhaps glabrous; hypanthium portion ellipsoid to obconic, 0.8–1 mm, ribbed; limb lobed nearly to base; lobes lanceolate, narrowly triangular, or linear, ca. 2 mm. Corolla white, tubular-funnel-form, inside villosulous in upper part of tube and onto lobes; tube ca. 7 mm; lobes lanceolate, ca. 1 mm. Anthers ca. 2 mm, apparently exerted. Stigmas ca. 0.8 mm, apparently exerted. Fruit capsular, subglobose, ca. 3 mm in diam., pilosulous to perhaps glabrescent; seeds numerous, angled, reticulate. Fl. and fr. Sep.

• Mixed forests; ca. 1400 m. S Yunnan (Jinghong).

The calyx (including presumably the hypanthium) was described in the protologue as pubescent but both this and the fruit are shown in the protologue figure as glabrous.

64. *Hedyotis wuzhishanensis* R. J. Wang, Novon 18: 266. 2008.

五指山耳草 wu zhi shan er cao

Subshrubs or shrubs, erect, perennial, to 1 m tall; stems terete, densely villous to hirtellous. Leaves petiolate; petiole 3–10 mm, densely hirtellous; blade drying papery, elliptic, ovate, or lanceolate, 2.5–6.2 × 1.4–3.3 cm, adaxially sparsely to moderately strigose to hispidulous, abaxially densely to moderately villosulous to hispidulous, base cuneate, obtuse, or rounded, apex acute; secondary veins 4 or 5 pairs, prominulous abaxially; stipules persistent or perhaps tardily deciduous, interpetiolar, triangular, 1–2.5 mm, densely hirtellous, acute to aristate. Inflorescences terminal, pseudoaxillary, and/or axillary in uppermost leaf axils, subcapitate, 0.7–1.2 cm in diam., densely hirtellous, (2–)6–15-flowered, subsessile, enclosed by lanceolate bracts 5–10 mm. Flowers sessile to subsessile, biology unknown. Calyx densely hirtellous; hypanthium portion ellipsoid, ca. 1.8 mm; limb lobed essentially to base; lobes narrowly triangular, 1.5–3 mm. Corolla white, tubular-funnel-form, outside glabrescent; tube 5.5–6.5 mm, inside villosulous in upper part and throat; lobes narrowly triangular to lanceolate, ca. 2.5 mm. Anthers exerted, 1.5–2 mm. Stigmas included, 1–2 mm. Fruit capsular, ovoid, ca. 3 × 2.5 mm, densely pilosulous or hirtellous, loculicidally dehiscent then septical; seeds ca. 15, black, angled, ca. 0.5 mm. Fl. and fr. Oct–Dec.

• Forests; 600–1600 m. Hainan.

65. *Hedyotis xanthochroa* Hance, J. Bot. 23: 324. 1885.

黄叶耳草 huang ye er cao

Oldenlandia xanthochroa (Hance) Kuntze.

Herbs, perennial, erect, to 40 cm tall; stems obtusely 4-angled, shallowly sulcate, sparsely tomentulose, hispid, or pilosulous becoming glabrescent. Leaves sessile; blade drying stiffly papery, elliptic-oblong to ovate, 4–5.5 × 0.6–2.6 cm, adaxially sparsely to moderately scabrous to hispid on lamina

and densely hispidulous to scaberulous on principal veins, abaxially hirtellous or hispidulous throughout with pubescence denser on veins, black glandular-punctate under magnification on both surfaces, base broadly rounded and somewhat amplexicaul, apex shortly acuminate; secondary veins ca. 4 pairs; stipules fused to petiole bases, triangular-lanceolate, 4–5 mm, hispidulous on margins or throughout, marginally lacinate to setose-lobed, apex acute to acuminate. Inflorescences terminal, congested-cymose to subcapitate, 1.5–4.5 cm, sparsely to densely hispid to pilosulous, several flowered, shortly pedunculate; peduncles 0.5–1.5 cm; bracts lanceolate, ovate, or narrowly elliptic, 4–8 mm; pedicels 1–4 mm. Flowers subsessile. Calyx sparsely villous; limb lobed; lobes linear-lanceolate, ca. 6 mm. Corolla dark purple, tubular, outside villous; tube ca. 5.5 mm; lobes ca. 5.5 mm. Anthers exerted. Stigma exerted. Fruit capsular, ellipsoid-oblong to obovoid, 3.5–4.5 mm, cartilaginous to papery, densely hispid to pilosulous, loculicidally and septicidally dehiscent through apical portion then sometimes splitting septicidally throughout, beak conical, ca. 1 mm, with persistent calyx lobes narrowly triangular, 5–5.5 mm, with partially persistent septal structure spongy-cartilaginous, ellipsoid, 3–3.5 mm, deeply pitted where seeds were situated; seeds several, black, triangular to irregularly angled, ca. 1 mm. Fl. Jul–Aug, fr. Dec.

- Mountain slopes in valleys at middle elevations. Guangdong.

66. *Hedyotis yangchunensis* W. C. Ko & Zhang, J. S. China Agric. Univ. 16(4): 45. 1995.

阳春耳草 yang chun er cao

Herbs or subshrubs, erect, to 50 cm tall; stems 4-angled to subterete, densely scabrous to smooth. Leaves petiolate, often crowded at tops of stems; petiole 15–20 mm, glabrous; blade drying thickly papery, narrowly elliptic, oblanceolate, or elliptic-oblong, (3–)8–12 × (1–)3–4.5 cm, glabrous, base acute and decurrent, apex obtuse to broadly obtuse; secondary veins 5–7 pairs; stipules broadly triangular, ca. 16 mm, lacerate or with several narrow lobes. Inflorescences and flowers not seen. Infructescences terminal, in a panicle of congested-cymose or capitate heads; heads 2–5, hemispherical to subglobose, 2–2.3 cm in diam., several flowered, pedunculate, enclosed by a pair of ovate reduced leaves or leaflike bracts ca. 15 mm; peduncles 5–7 cm; floral bracts linear, 5–7 mm; pedicels 2–3 mm. Fruit capsular, ellipsoid or subglobose, ca. 3 × 2–2.5 mm, membranous, septicidally dehiscent then loculicidal, with calyx lobes lanceolate to elliptic, 3–3.5 mm, longitudinally veined, long acuminate; seeds several, black, angled. Fl. Apr–Jun.

- Hills, sparse forests in valleys; ca. 400 m. Guangdong (Yangchun).

67. *Hedyotis yazhouensis* F. W. Xing & R. J. Wang, Acta Phytotax. Sin. 41: 87. 2003.

崖州耳草 ya zhou er cao

Herbs or subshrubs, perennial, erect, to 10 cm tall; stems weakly 4-angled. Leaves sessile or subsessile, crowded at tops of stems; blade drying papery, obovate or ovate-elliptic, 8–20 × 4–12 cm, base obtuse, apex obtuse to broadly obtuse; secondary veins 5–8 pairs; stipules obtuse to spatulate, 2–6 mm, lacerate with lobes ca. 1 mm. Inflorescence terminal, capitate, hemispherical, 3–5 cm in diam., several flowered, sessile to subsessile; bracts linear-lanceolate, ca. 8 mm, acute. Flowers sessile. Calyx densely puberulent; hypanthium portion ellipsoid to obovoid, 3–4 mm; limb divided essentially to base; lobes linear, ca. 35 × 1 mm. Corolla blue-purple, slenderly funnel-form, outside sparsely puberulent; tube ca. 30 mm; lobes ovate, ca. 1 mm. Stigmas included. Fruit indehiscent, ellipsoid to obovoid, ca. 3 mm, densely pilosulous; seeds 8–12, black, papillose. Fl. and fr. Oct.

- Understories of tropical rain forests; 100–300 m. S Hainan (Sanya).

