

121. DESMODIUM Desvaux, J. Bot. Agric. 1: 122. 1813, nom. cons.

山蚂蝗属 shan ma huang shu

Huang Puhua (黄普华 Huang Pu-hwa); Hiroyoshi Ohashi

Herbs, subshrubs, or shrubs. Leaves pinnately 3-foliolate or 1-foliolate by reduction of lateral leaflets, stipulate, stipellate. Flowers usually smaller, in racemes or panicles, axillary or terminal, rarely solitary or binate in leaf axils. Bracts persistent or early deciduous; bracteoles present or absent. Calyx campanulate, 4- or 5-lobed, bilabiate; upper 2 lobes connate for all or most of length, entire or 2-toothed at apex, lower lobes free, longest. Corolla white, green-white, pink, purple, or violet; standard elliptic or obovate to nearly orbicular; wings \pm adherent to keel, wholly clawed. Stamens diadelphous (9+1), rarely monadelphous. Ovary usually sessile, with several to many ovules. Legume compressed, usually indehiscent, transversely segmented, upper (adaxial) suture slightly constricted or straight, lower (abaxial) one constricted; articles mostly ellipsoidal to quadrangular. Cotyledons epigeous.

About 280 species: mostly in subtropical and tropical regions; 32 species (four endemic, three introduced) in China.

- 1a. Stamens monadelphous, axillary filament connate to other filaments above middle (only *D. sequax* to below middle).
- 2a. Stipules linear; keel equal to wings; legume moniliform, with dense rust-colored or brown minute hooked hairs 32. *D. sequax*
- 2b. Stipules mostly narrowly ovate; keel shorter than wings; legume not moniliform, with hooked and straight hairs or glabrous.
- 3a. Bracteoles absent.
- 4a. Legume densely appressed sericeous; leaflets abaxially sericeous, midvein and lateral veins conspicuous 25. *D. multiflorum*
- 4b. Legume glabrous; leaflets abaxially velutinous, veins inconspicuous 26. *D. amethystinum*
- 3b. Bracteoles present.
- 5a. Terminal leaflet 5–17 cm wide.
- 6a. Young branchlets white pubescent; terminal leaflet ovate or broadly ovate, base oblique, abaxially densely sericeous 30. *D. megaphyllum*
- 6b. Young branchlets densely white or gray tomentose; terminal leaflet orbicular, ovate, or obovate, base not oblique, abaxially densely gray or white tomentose 31. *D. yunnanense*
- 5b. Terminal leaflet 1–5 cm wide.
- 7a. Terminal leaflet lanceolate or lanceolate-linear, more than $4 \times$ as long as wide; legume glabrous 29. *D. stenophyllum*
- 7b. Terminal leaflet not as above, if lanceolate, then less than $2 \times$ as long as wide; legume hairy or subglabrous.
- 8a. Apex of standard emarginate; keel not mucronate at apex; young branchlets pubescent 27. *D. elegans*
- 8b. Apex of standard orbicular, not emarginate; keel mucronate at apex; young branchlets subglabrous 28. *D. callianthum*
- 1b. Stamens diadelphous, axillary filament free from other filaments.
- 9a. Legume linear, articles linear, oblong, or oblong-linear to narrowly obovoid, ca. $3 \times$ as long as wide or more.
- 10a. Leaves 1-foliolate (*D. gracillimum* rarely 3-foliolate near base of stem).
- 11a. Leaves 1-foliolate, leaflet blade ovate, ovate-elliptic, or lanceolate, $5\text{--}12 \times 2\text{--}5$ cm; legume $8\text{--}12$ cm, $6\text{--}8$ -jointed, articles longer than 12 mm 4. *D. zonatum*
- 11b. Leaves often 1-foliolate, sometimes 3-foliolate near base of stem, leaflet blade broadly triangular or broadly ovate, $2\text{--}3.5 \times 1.5\text{--}2.5$ cm; legume $2\text{--}3.5$ cm, $3\text{--}5$ -jointed, articles $6\text{--}7$ mm 5. *D. gracillimum*
- 10b. Leaves 3-foliolate.
- 12a. Terminal leaflet elliptic-oblong, $1\text{--}4 \times 0.7\text{--}2.5$ cm, lateral veins 4 or 5; stipules ca. 2 mm 6. *D. scorpiurus*
- 12b. Terminal leaflet basically ovate-elliptic, $4.5\text{--}10(15) \times 3\text{--}6(8)$ cm, lateral veins 7–12; stipules 7–10 mm.
- 13a. Legume plicate when young; pedicels deflexed after flowering; flowers opening almost at same time; articles oblong; leaves always 3-foliolate 3. *D. hispidum*
- 13b. Legume always straight; pedicels not deflexed after flowering; flowers opening one by one; articles linear to narrowly oblong; leaves 3- or 1–3-foliolate.
- 14a. Terminal leaflet ovate or ovate-elliptic, lateral veins 9–12; upper lobe of calyx entire or nearly so at apex 1. *D. laxiflorum*

- 14b. Terminal leaflet rhombic-ovate or obovate, lateral veins 7–9; upper lobe of calyx 2-toothed at apex 2. *D. diffusum*
- 9b. Legume narrowly oblong, articles often orbicular, nearly oblong, or nearly quadrate, nearly as long as wide or slightly longer.
- 15a. Leaves 1-foliolate (*D. styracifolium* sometimes 3-foliolate).
- 16a. Leaflets orbicular to broadly obovate, reniform, or compressed rhombic.
- 17a. Leaflets orbicular to broadly obovate, abaxially densely adpressed white sericeous, lateral veins 8–10 20. *D. styracifolium*
- 17b. Leaflets reniform or compressed rhombic, abaxially glabrous, lateral veins 3 or 4 21. *D. renifolium*
- 16b. Leaflets not as above, longer than wide.
- 18a. Leaflets 1–2.2 × 0.7–1.2 cm; legume glabrous 19. *D. rubrum*
- 18b. Leaflets longer than 3 cm; legume hairy or nearly glabrous.
- 19a. Flowers crowded on peduncles; leaflets yellow-brown velutinous on both surfaces 14. *D. velutinum*
- 19b. Flowers lax, scattered on peduncles; leaflets adaxially glabrous, abaxially pubescent or villous.
- 20a. Flowering pedicel ca. 12 mm; legume subglabrous, glabrescent 13. *D. oblongum*
- 20b. Flowering pedicel 2–5 mm; legume with hooked hairs.
- 21a. Corolla green-white; petioles with dense straight and minute hooked hairs 11. *D. gangeticum*
- 21b. Corolla purple; petioles sparsely villous 12. *D. flexuosum*
- 15b. Leaves 3-foliolate (*D. dichotomum*, *D. heterophyllum*, *D. microphyllum*, *D. reticulatum*, and *D. tortuosum* sometimes mixed 1-foliolate leaves near base of stem).
- 22a. Terminal leaflet shorter than 2.5 cm.
- 23a. Racemes 6-flowered to numerous.
- 24a. Leaflets obtriangular-ovate or obovate, 1–2.5 × 1–1.6 cm; branchlets spreading yellow-brown or rust-colored pubescent; seed without aril 15. *D. griffithianum*
- 24b. Larger leaflets narrowly obovate-elliptic or narrowly elliptic, 1–1.2 × 0.4–0.6 cm, smaller leaflets obovate or elliptic, 0.2–0.6 × 0.15–0.4 cm; branchlets nearly glabrous; seed arillate 22. *D. microphyllum*
- 23b. Flowers solitary, in pairs at axils, or 2 or 3 scattered on peduncle.
- 25a. Terminal leaflet broadly elliptic or broadly obovate; flowering pedicel 10–25 mm; articles of legume 3.5–4 mm 23. *D. heterophyllum*
- 25b. Terminal leaflet obcordate, obtriangular, or obovate; flowering pedicel 3–8 mm; articles of legume shorter than 2.5 mm 24. *D. triflorum*
- 22b. Terminal leaflet usually longer than 2.5 cm.
- 26a. Racemes shorter than 7 cm; flowers dense.
- 27a. Rachis densely yellowish spreading hooked hairy; legume erect 16. *D. heterocarpon*
- 27b. Rachis densely gray-white adpressed villous; legume pendent 17. *D. strigillosum*
- 26b. Racemes longer than 10 cm; flowers slightly sparse.
- 28a. Terminal leaflet narrowly ovate, or ovate-elliptic to narrowly elliptic, adaxially glabrous 18. *D. reticulatum*
- 28b. Terminal leaflet elliptic, broadly elliptic, ovate, broadly ovate, or rhombic-ovate to obovate, adaxially sparsely hairy.
- 29a. Upper suture of legume straight or slightly undulate, lower suture constricted between articles.
- 30a. Shrubs with terete and glabrescent branches; terminal leaflet elliptic or obovate 9. *D. concinnum*
- 30b. Prostrate or climbing herbs with triangular stems; terminal leaflet broadly ovate to rhombic, rarely elliptic 10. *D. intortum*
- 29b. Both sutures of legume constricted between articles, moniliform.
- 31a. Flowering pedicel 8–17 mm, with minute hooked and glandular hairs; bracts caducous; leaflets sparsely hairy on both surfaces 7. *D. tortuosum*
- 31b. Flowering pedicel 2–5 mm, with minute hooked hairs and minute pubescence; bracts persistent; leaflets adaxially with adpressed and intermixed hooked hairs, abaxially densely adpressed hairy 8. *D. dichotomum*

1. *Desmodium laxiflorum* Candolle, Ann. Sci. Nat. (Paris) 4: 大叶拿身草 da ye na shen cao
100. 1825.

Desmodium macrophyllum Desvaux; *D. recurvatum* (Rox-

burgh) Graham ex Wight & Arnott; *Hedysarum recurvatum* Roxburgh.

Subshrubs or shrubs, erect, 30–120 cm tall. Young branchlets with adpressed and minute hooked hairs. Leaves 3-foliolate; petiole 1.5–4 cm; terminal leaflet blade ovate or ovate-elliptic, 9–19 × 3–8 cm, abaxially densely yellow sericeous, adaxially sparsely adpressed hairy, lateral veins 9–12, apex shortly acuminate. Racemes terminal and axillary, often 2 axillary, to 28 cm; rachis pubescent intermixed with minute hooked hairs, 2–7-flowered, fascicled. Pedicel 5–10 mm, densely hairy as rachis. Calyx densely villous; upper lobes entire or nearly so at apex. Corolla white to violet, 4–7 mm; standard broadly obovate or orbicular; wings auriculate and clawed; keel clawed. Legume linear, 2–6 cm, with dense, minute, hooked hairs, 4–12-jointed, both sutures nearly not constricted between articles; articles oblong. Fl. Aug–Oct, fr. Oct–Nov. $2n = 22$.

Secondary forest margins, thickets, grassy slopes; 200–2400 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam].

2. *Desmodium diffusum* Candolle, Ann. Sci. Nat. (Paris) 4: 100. 1825.

单序山蚂蝗 dan xu shan ma huang

Desmodium laxiflorum Candolle var. *formosense* Ohwi; *D. laxiflorum* subsp. *parvifolium* H. Ohashi & T. T. Chen; *D. unibotryosum* C. Chen & X. J. Cui; *Hedysarum diffusum* (Candolle) Roxburgh (1832), not Willdenow (1801).

Subshrubs or shrubs, nearly erect, 30–100 cm tall. Branchlets with adpressed and minute hooked hairs. Leaves 3-foliolate; petiole 1–4 cm; terminal leaflet blade rhombic-ovate or obovate, shorter than 9 cm, abaxially densely yellow sericeous, adaxially sparsely adpressed hairy, lateral veins 7–9, apex acute. Racemes solitary, often terminal, to 25 cm; rachis pubescent intermixed with minute hooked hairs. Pedicel 3–5 mm, densely hairy as rachis. Calyx densely villous; upper lobes minutely 2-toothed at apex. Corolla white to violet, 4–7 mm; standard broadly obovate or orbicular. Legume linear, 2–6 cm, with dense, minute, hooked hairs, 4–12-jointed, both sutures distinctly constricted between articles; articles oblong. Fl. and fr. Aug–Nov.

Thickets, forest margins, mountain slopes; 100–2500 m. Guangdong, Guangxi, Taiwan, Yunnan [India, Indonesia, Laos, Myanmar, Nepal, Philippines, Thailand, Vietnam].

This species has been confused with *Desmodium laxiflorum*. However, it is well distinguished from it by terminal leaflets rhombic-ovate or obovate, shorter than 9 cm, acute at apex, lateral veins often 7–9 pairs; racemes solitary; pedicel 3–5 mm; upper calyx lobe 2-toothed at apex; and both sutures of legume distinctly constricted between articles.

3. *Desmodium hispidum* Franchet, Pl. Delavay. 174. 1890.

粗硬毛山蚂蝗 cu ying mao shan ma huang

Uraria henryi Schindler; *U. hispida* (Franchet) Schindler.

Shrubs or subshrubs, erect, 0.5–1 m tall. Stems striate; branches densely yellowish villous; old branches purple, gla-

brous. Leaves 3-foliolate; stipules ovate or narrowly triangular-ovate, 10–15 × 3–4 mm; petiole 1–2 cm, densely yellowish villous; petiolules 4–6 mm; leaflets papery; terminal leaflet ovate to elliptic, 5–17 × 3–8 cm, abaxially yellowish villous, adaxially densely hispid, glabrescent, lateral veins 8–11 on each side of midvein, reaching margin, margin entire, midvein and lateral veins prominent on both surfaces. Inflorescences densely yellowish villous, paniculate when terminal, fasciculate with (1 or) 2–4 racemes or sometimes panicles at axils, 8–25 cm; primary bracts narrowly triangular-ovate, 4–5 × ca. 1 mm at base; secondary bracts 1.5–2.5 mm. Pedicel 4–5 mm, deflexed after flowering; bracteoles absent. Flowers 2–8 per node, fasciculate, opening almost at same time. Calyx 3–4 mm, outside densely yellowish villous, 4-lobed; lobes lanceolate, subequal. Corolla white, pale yellow, or greenish white, 4–5 mm; standard elliptic to broadly elliptic, without auricles, claw ca. 1 mm; wings elliptic, claw ca. 1 mm; keel ca. 4 mm, auriculate, claw ca. 1 mm. Androecium diadelphous. Legume sessile, 1.2–1.8 cm, with dense hooked hairs, plicate when young, straight when mature, 4–7-jointed, both sutures undulate; articles elliptic, 2.5–3 × ca. 1.5 mm. Seeds elliptic. Fl. and fr. Sep–Dec.

700–2400 m. Guizhou, Sichuan, Yunnan [India, Myanmar].

4. *Desmodium zonatum* Miquel, Fl. Ned. Ind. 1: 250. 1855.

单叶拿身草 dan ye na shen cao

Desmodium shimadae Hayata; *Meibomia zonata* (Miquel) Kuntze.

Subshrubs, erect, 30–80 cm tall. Young branches with dense, minute, hooked hairs, intermixed with sparse adpressed hairs. Leaves 1-foliolate; petiole 1–2.5 cm; blade ovate, ovate-elliptic, or lanceolate, 5–12 × 2–5 cm, abaxially densely yellow-brown pubescent, adaxially glabrous or with sparse, minute, hooked hairs on veins. Racemes usually terminal, 10–25 cm, densely hooked hairy and sparsely long straight pubescent on rachis, 2- or 3-flowered at each node. Pedicel 4–10 mm. Calyx 2.5–3 mm; lobes longer than tube. Corolla white or pink, 6–7 mm; standard obovate, attenuate to base; wings narrowly obovate-elliptic, auriculate, shortly clawed; keel curved. Legume linear, 8–12 cm, 6–8-jointed, both sutures shallowly undulate; articles oblong-linear, longer than 12 mm, with dense, yellow, minute, hooked hairs. Fl. Jun–Aug, fr. Aug–Sep.

Dense forests, forest margins; 500–1300 m. SW Guangxi, Guizhou, Hainan, Taiwan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; Pacific islands].

5. *Desmodium gracillimum* Hemsley, Ann. Bot. (Oxford) 9: 152. 1895.

细叶山蚂蝗 xi ye shan ma huang

Subshrubs, prostrate, 30–60 cm tall. Stems sparsely adpressed pubescent and spreading minutely uncinately hairy. Leaves 1-foliolate, rarely 3-foliolate near base of stem; petiole 0.5–2 cm; blade broadly triangular or broadly ovate, 2–3.5 × 1.5–2.5 cm, abaxially adpressed sericeous, intermixed with sparse, minute, uncinately hairs, adaxially with subspreading, uncinately hairs, base cordate, apex obtuse. Racemes terminal, 8–20 cm; rachis hairy, laxly flowered, often with 3-flowered fas-

cicles. Pedicel 4–6 mm, densely uncinately hairy. Calyx 2–2.3 mm; lobes nearly equal to tube. Corolla white-purple, 4–5 mm; standard obovate, shortly clawed; wings and keel wholly shortly clawed. Legume linear, 2–3.5 × ca. 0.2 cm, lower suture more deeply undulate, upper suture shallowly undulate, 3–5-jointed; articles narrowly elliptic, 6–7 × ca. 2 mm, with dense, spreading, minute, uncinately hairs. Fl. Sep–Nov, fr. Nov–Dec.

- Wastelands; low elevations (200–300 m). S Taiwan.

6. *Desmodium scorpiurus* (Swartz) Desvaux, J. Bot. Agric. 1: 122. 1813.

蝎尾山蚂蝗 xie wei shan ma huang

Hedysarum scorpiurus Swartz, Prodr. 107. 1788; *Desmodium akoense* Hayata.

Herbs, perennial. Stems ascending or diffuse, hooked hairy. Leaves 3-foliolate; petiole 1.5–3 cm, minutely hooked hairy; terminal leaflet blade ovate or broadly elliptic to obovate, 1–4 × 0.7–2.5 cm, lateral ones slightly smaller, both surfaces adpressed hairy, lateral veins 4 or 5, base obtuse, apex obtuse-rounded or emarginate. Racemes terminal or axillary; rachis slender, minutely hooked hairy, laxly flowered, 1- or 2-flowered at each node. Pedicel 3–7 mm, with hooked hairs, sometimes intermixed with straight hairs. Calyx campanulate, ca. 2.5 mm; upper lobes slightly 2-toothed. Corolla pink, ca. 4 mm; standard obovate; wings oblong, clawed; keel obliquely obovate, long clawed. Ovary linear, ca. 3.5 mm; style curved. Legume linear, slender, 2–5 × ca. 0.25 cm, 3–8-jointed, constricted between articles; articles 4–6 mm, 3–4 × as long as wide, hooked hairy. Fl. and fr. Aug–Oct. $2n = 22^*$.

Open dry places; low and middle elevations (sea level to 500 m). Introduced and naturalized in S Taiwan [introduced in Australia, New Guinea, Pacific islands, and Philippines; native to tropical America].

7. *Desmodium tortuosum* (Swartz) Candolle, Prodr. 2: 332. 1825.

南美山蚂蝗 nan mei shan ma huang

Hedysarum tortuosum Swartz, Prodr. 107. 1788; *Desmodium purpureum* (Miller) Fawcett & Rendle; *H. purpureum* Miller.

Herbs, perennial, erect, 50–200 cm tall. Stems with hooked hairs, sometimes intermixed with long hairs. Leaves 3-foliolate, rarely 1-foliolate; petiole 1–8 cm, hairy as stems; terminal leaflet blade elliptic or ovate, 3–8(–14) × 1.5–3(–6) cm, both surfaces sparsely hairy, base cuneate, apex obtuse. Racemes or sometimes panicles, terminal or axillary; rachis with dense minute hooked and glandular hairs, 2-flowered at each node. Pedicel filiform, to 1.7 cm at fruiting, hairy as rachis. Calyx 3–4 mm, 5-parted; lobes longer than tube. Corolla red, white, or yellow; standard obovate, 2.5–3.5 × ca. 2 mm, base attenuate, apex emarginate; wings oblong, base auriculate, shortly clawed; keel obliquely oblong, clawed. Legume narrowly oblong, 1.5–2 cm, both sutures constricted between articles, moniliform, densely gray-yellow hooked hairy, (3–)5–7-jointed. Fl. and fr. Jul–Sep. $2n = 22$.

Wastelands, plains; low elevations. Introduced and naturalized in

Guangdong [native from S United States to subtropical South America; naturalized in tropics of Old World].

8. *Desmodium dichotomum* (Willdenow) Candolle, Prodr. 2: 336. 1825.

二歧山蚂蝗 er qi shan ma huang

Hedysarum dichotomum Willdenow, Sp. Pl. 3: 1180. 1802; *Desmodium diffusum* (Willdenow) Candolle (Nov 1825), not Candolle (Jan 1825); *H. diffusum* Willdenow (1801), not (Candolle) Roxburgh (1832).

Subshrubs or diffuse herbs, 20–80 cm tall. Stems adpressed long straight hairy and spreading hooked hairy. Leaves 3-foliolate, sometimes 1-foliolate near base of stem; petiole 1.5–3.5 cm, hairy; leaflet blade elliptic or ovate to broadly elliptic or broadly ovate, 1.5–7 × 1–6 cm, abaxially densely adpressed hairy, adaxially with sparse adpressed hairs, intermixed with sparse hooked hairs. Racemes terminal or axillary or usually panicles, 5–45 cm, hooked hairy, laxly flowered, 2- or 3-flowered at each node. Pedicel 2–5 mm. Calyx 4-lobed, ca. as long as tube; upper lobes 2-toothed. Corolla purple to violet, ca. 3 mm; standard obovate or broadly obovate, base shortly clawed; wings and keel wholly shortly clawed at base. Ovary densely pubescent, 5- or 6-ovuled. Legume narrowly oblong, 1–1.8 cm × 2.5–3 mm, densely hooked hairy, 5- or 6-jointed, both sutures shallowly constricted between articles. Fl. Jun–Aug, fr. Sep–Oct. $2n = 22$.

Forests, thickets. S Yunnan [India, Indonesia, Malaysia, Myanmar].

9. *Desmodium concinnum* Candolle, Ann. Sci. Nat. (Paris) 4: 101. 1825.

凹叶山蚂蝗 ao ye shan ma huang

Desmodium barbigerum H. Léveillé.

Shrubs, 80–150 cm tall. Young branches adpressed pubescent. Leaves 3-foliolate; petiole 0.8–1.3 cm, densely gray hairy; terminal leaflet blade elliptic or obovate, 4–9 × 1.5–3 cm, both surfaces adpressed pubescent, base cuneate, apex acute to obtuse-rounded, mucronate. Racemes terminal and axillary, 20–35 cm; rachis gray puberulent and hooked hairy, 2–4-flowered at each node. Pedicel ca. 1 cm, hooked hairy. Calyx 2–3.5 mm; lobes nearly equal. Corolla purple to violet; standard broadly obovate or orbicular, 5.5–7 × 5–6 mm, clawed; wings broadly obovate, 4.5–6 × ca. 3 mm, long clawed. Ovary hairy, 5- or 6-ovuled. Legume narrowly oblong, 4–6-jointed, lower suture deeply constricted near upper suture, upper suture thickened and nearly straight or slightly undulate, sparsely minutely hooked hairy. Fl. Sep–Oct, fr. Oct.

Grasslands, mountain slopes, thickets; ca. 1300 m. Guangxi, S Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Pakistan, Vietnam].

10. *Desmodium intortum* (Miller) Urban, Symb. Antill. 8: 292. 1920.

扭曲山蚂蝗 niu qu shan ma huang

Hedysarum intortum Miller, Gard. Dict., ed. 8, *Hedysarum* no. 11. 1768; *Desmodium nantouense* Y. C. Liu & F. Y. Lu.

Herbs, perennial, scandent, to 3 m. Stems triangular, with

white spongy pith, densely yellowish uncinat hispid and pilose or sometimes nearly glabrous. Leaves 3-foliolate; stipules ovate, 4–12 mm, acuminate or caudate, often persistent; petiole 3–9 cm, hairy as stems; terminal leaflet blade ovate or sometimes broadly elliptic, 5–13 × 2–7 cm, papery, both surfaces appressed pilose, base rounded to truncate, apex acute. Racemes terminal or axillary, to 30 cm; rachis with dense appressed to spreading hooked hairs, 2-flowered at each node. Pedicel filiform, 6–10 mm. Calyx 2.5–3 mm, 5-parted; lowest lobe longest. Corolla purplish red to violet becoming bluish or greenish white, 9–11 mm. Legume shortly stipitate, narrowly oblong, 2–4.5 cm × 3–4 mm, densely brownish hooked hairy, 5–10-jointed, lower suture deeply constricted, upper suture thickened, slightly sinuate; stipe ca. 2 mm; articles semicircular or rhombic, 4–5 mm. Fl. Jul–Oct, fr. Oct–Nov. $2n = 22, 24$.

100–1400 m. Introduced in Taiwan [native to Central and South America].

11. *Desmodium gangeticum* (Linnaeus) Candolle, Prodr. 2: 327. 1825.

大叶山蚂蝗 da ye shan ma huang

Hedysarum gangeticum Linnaeus, Sp. Pl. 2: 746. 1753;
Desmodium cavaleriei H. Léveillé.

Shrubs, erect or nearly so, to 1 m tall, much branched, pilose. Leaves 1-foliolate, variable in shape and size; petiole 1–2 cm; blade narrowly elliptic-ovate, sometimes ovate or lanceolate, 3–13 × 2–7 cm, abaxially sparsely gray villous, adaxially glabrous except for hairy midvein, base rounded, apex acute. Racemes terminal and axillary or sometimes panicles, 10–30 cm, 2–6-flowered at each node. Pedicel 2–5 mm, hairy. Calyx ca. 2 mm, 4-lobed; lobes slightly longer than tube. Corolla green-white, 3–4 mm; standard obovate; wings oblong, base auriculate, shortly clawed; keel narrowly obovate, not auriculate. Ovary hairy. Legume linear, slightly curved, 1.2–2 × ca. 0.25 cm, lower suture deeply undulate, upper suture slightly constricted between seeds, hooked pubescent, 6–8-jointed. Fl. Apr–Aug, fr. Aug–Sep. $2n = 22$.

Secondary forests, waste grasslands; 300–900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, SC Taiwan, S and SE Yunnan [Bhutan, Cambodia, India, Kashmir, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; tropical Africa, Australia, Pacific islands; naturalized in the West Indies].

12. *Desmodium flexuosum* Wallich ex Benth var. ***cordifoliolatum*** (P. C. Li) P. H. Huang, Bull. Bot. Res., Harbin 18: 6. 1998.

心叶山蚂蝗 xin ye shan ma huang

Desmodium cordifoliolatum P. C. Li, Acta Bot. Yunnan. 11: 301. 1989.

Subshrubs. Branchlets sparsely villous. Leaves 1-foliolate; stipules 5–6 mm; petiole 7–8 mm, sparsely villous; blade ovate, 2–3.5 cm, abaxially villous, adaxially glabrous. Racemes 10–15 cm; rachis sparsely villous, densely hooked pubescent, with 2–4 flowers, clustered. Pedicel ca. 2 mm. Calyx broadly campanulate, ca. 1.5 mm. Corolla purple; standard broadly obovate, 4.5–4.7 × ca. 3.5 mm, base shortly clawed; wings oblong, ca. 3 ×

1.5 mm, auriculate, clawed; keel falcate-oblong, longer than wings. Legume narrowly oblong, 0.8–1.8 cm × 2–2.5 mm, 3–7-jointed; articles broadly ovoid, hooked pubescent, reticulate veined.

• Meadows. Sichuan.

Desmodium cordifoliolatum was described from a specimen from Dechang, Sichuan. It differs from typical *D. flexuosum* in having smaller stipules, leaflets, and petioles. One of us (Ohashi) regards *D. cordifoliolatum* as a synonym of *D. gangeticum* (see J. Jap. Bot. 70: 113. 1995).

Desmodium flexuosum var. *flexuosum* occurs in Myanmar and Thailand. It is a subshrub, 30–50 cm tall, with leaves 1-foliolate, petiole 3–6 cm, blade (3–)4.5–7.5 × (2.5–)4–7.2 cm, and stipules 0.9–1.2 cm.

13. *Desmodium oblongum* Wallich ex Benth in Miquel, Pl. Jungh. 224. 1852.

长圆叶山蚂蝗 chang yuan ye shan ma huang

Shrubs, erect, 70–150 cm tall, much branched, sparsely hooked hairy. Leaves 1-foliolate; petiole 1–1.4 cm, with dense, minute, hooked and straight, adpressed hairs; blade oblong or oblong-lanceolate, 7–12 × 2.5–4.5 cm, abaxially densely adpressed pubescent, veins sparsely minutely hooked hairy, adaxially glabrous except for hairy veins. Panicles terminal or axillary, 10–30 cm, laxly flowered, 2-flowered at each node. Pedicel ca. 1.2 cm, elongated to 1.7 cm at fruiting. Calyx ca. 3 mm; lobes ca. as long as tube. Corolla purple or violet, 8–10 mm; standard nearly orbicular to broadly obovate, shortly clawed; wings obliquely oblong, auriculate, shortly clawed; keel clawed. Stamens monadelphous. Ovary adpressed pubescent, 6–9-ovuled. Legume narrowly oblong, 1.5–3 × ca. 0.3 cm, lower suture crenate, upper suture deeply constricted, subglabrous, glabrescent, 5–7-jointed. Fl. and fr. Aug–Nov.

Broad-leaved forests or thickets; 1000–1900 m. Guangxi, Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

14. *Desmodium velutinum* (Willdenow) Candolle, Prodr. 2: 328. 1825.

绒毛山蚂蝗 rong mao shan ma huang

Shrubs or subshrubs, to 150 cm tall. Young branches densely yellow-brown velutinous and shortly hooked hairy. Leaves 1-foliolate, rarely intermixed with 3-foliolate leaves; petiole 1.5–1.8 cm, densely yellow velutinous; blade ovate, ovate-lanceolate, triangular-ovate, or broadly ovate, 4–17 × 2.5–11.5 cm, both surfaces yellow velutinous, indumentum denser and longer abaxially. Inflorescences terminal and axillary, racemose or paniculate, 4–10 cm, terminal ones often broadly paniculate, to 20 cm, 2–5-flowered at each node; bracts subulate or lanceolate, 2.5–12 × 0.3–0.7 mm. Pedicel ca. 1.5 mm. Calyx 2–3 mm, 4-lobed. Corolla purple or pink, 3–5 mm; standard obovate-orbicular; wings narrowly elliptic, auriculate; keel narrow, not auriculate. Legume narrowly oblong, 1–2 cm × 2–3 mm, lower suture incised between seeds, upper suture nearly straight, with dense yellow straight hairs intermixed with short hooked hairs, 5–7-jointed. Fl. and fr. Aug–Nov. $2n = 22$.

Sunny grassy slopes, streamsides, thickets, mixed forests; 100–1400 m. Guangdong, SW Guangxi, Guizhou, Hainan, S Taiwan, S and

SW Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa; introduced in tropical Americas and Australia].

- 1a. Bracts subulate, 2.5–3.5 × ca. 0.3 mm, sparsely hirsute; terminal inflorescences racemose or paniculate, 4–10 cm 14a. subsp. *velutinum*
1b. Bracts lanceolate, 7–10 × ca. 0.7 mm, densely hirsute; terminal inflorescences paniculate, to 20 cm 14b. subsp. *longibracteatum*

14a. *Desmodium velutinum* subsp. *velutinum*

绒毛山蚂蝗(原亚种) rong mao shan ma huang (yuan ya zhong)

Hedysarum velutinum Willdenow, Sp. Pl. 3: 1174. 1802; *Desmodium lasiocarpum* (Beauvois) Candolle; *D. latifolium* (Roxburgh) Candolle; *D. latifolium* var. *plukenetii* Wight & Arnott; *D. latifolium* var. *virgatum* Miquel; *D. plukenetii* (Wight & Arnott) Merrill & Chun; *D. velutinum* var. *plukenetii* (Wight & Arnott) Schindler; *D. virgatum* Prain; *H. lasiocarpum* Beauvois; *H. latifolium* Roxburgh.

Shrubs or subshrubs. Leaves 1-foliolate, rarely intermixed with 3-foliolate leaves; blade ovate-lanceolate, triangular-ovate, or broadly ovate, 4–11 × 2.5–8 cm. Terminal inflorescence racemose or paniculate, 4–10 cm; bracts subulate, 2.5–3.5 × ca. 0.3 mm, sparsely hirsute. Corolla ca. 3 mm. Fl. and fr. Sep–Nov. $2n = 22$.

Sunny grassy slopes, streamsides, thickets; 100–900 m. Guangdong, SW Guangxi, Guizhou, Hainan, S Taiwan, S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa; introduced in tropical Americas and Australia].

14b. *Desmodium velutinum* subsp. *longibracteatum* (Schindler) H. Ohashi, Ginkgoana 1: 194. 1973.

长苞绒毛山蚂蝗 chang bao rong mao shan ma huang

Desmodium longibracteatum Schindler, Repert. Spec. Nov. Regni Veg. 21: 7. 1925; *D. rufihirsutum* Craib; *D. velutinum* var. *longibracteatum* (Schindler) Meeuwen.

Shrubs. Leaves 1-foliolate; blade usually ovate, ca. 17 × 11.5 cm. Terminal inflorescence paniculate, to 20 cm; bracts lanceolate, 7–10 × ca. 0.7 mm, densely hirsute. Corolla ca. 5 mm. Fl. and fr. Aug–Oct.

Thickets, mixed forests; 200–1400 m. Guizhou, S and SW Yunnan [India, Indonesia, Laos, Myanmar, Thailand, Vietnam].

These subspecies were recognized at the rank of variety in FRPS (41: 29. 1995).

15. *Desmodium griffithianum* Benth in Miquel, Pl. Jungh. 222. 1852.

疏果山蚂蝗 shu guo shan ma huang

Desmodium griffithianum var. *leiocarpum* X. F. Gao & C. Chen; *D. oxalidifolium* H. Léveillé, p.p.

Subshrubs or herbs, prostrate or ascending, 30–60 cm tall. Branches spreading yellow-brown or rust-colored pubescent. Leaves 3-foliolate; petiole 0.6–2.6 cm, densely hairy as branches; leaflet blade obtriangular-ovate or obovate, 1–2.5 × 1–1.6 cm, abaxially adpressed puberulent, adaxially subglabrous, base cuneate, apex truncate. Racemes terminal, ca. 10 cm, rachis hairy as branches. Flowers dichotomous. Pedicel 3–5 mm, hairy as branches. Calyx 3–3.5 mm; tube 1–1.3 mm; lower lobes triangular, upper lobes distinctly 2-toothed at apex. Corolla purple-red, ca. 7 mm; standard nearly orbicular, clawed; wings oblong, shortly clawed; keel smaller than wings, clawed. Ovary strigose; style glabrous. Legume deflexed, nearly oblong, 1–1.5 cm × 2.5–3.5 mm, lower suture constricted, upper suture straight, 3- or 4-jointed; articles nearly quadrate, with hooked and straight rigid hairs. Fl. and fr. Aug–Sep. $2n = 22$.

Grassy slopes, roadsides, *Pinus* forests; 1500–2300 m. Guizhou, Sichuan, Yunnan [India, Laos, Myanmar, Thailand, Vietnam].

16. *Desmodium heterocarpon* (Linnaeus) Candolle, Prodr. 2: 337. 1825 [“*heterocarpon*”].

假地豆 jia di dou

Shrubs or subshrubs, erect or prostrate, 30–150 cm tall, much branched from base of stem. Leaves 3-foliolate; petiole 1–2 cm, slightly pubescent; terminal leaflet blade elliptic, narrowly elliptic, or broadly obovate, 2.5–6 × 1.3–3 cm, abaxially white adpressed pubescent, adaxially glabrous, base obtuse, apex rounded or obtuse, emarginate, mucronate. Racemes terminal or axillary, 2.5–7 cm; rachis with white, spreading, hooked hairs or yellowish or white, straight, appressed hairs, densely flowered. Pedicel 3–4 mm. Calyx 1.5–2 mm, 4-lobed; upper lobes slightly 2-toothed at apex. Corolla purple, purple-red, or white, ca. 5 mm; standard obovate-oblong, shortly clawed; wings obovate, auriculate, clawed; keel extremely curved, apex obtuse. Infructescence crowded. Legume erect, narrowly oblong, 1.2–2 cm × 2.5–3 mm, upper suture shallowly undulate, both sutures hooked hairy, 4–7-jointed; articles quadrate. Fl. Jul–Oct, fr. Oct–Dec. $2n = 22^*$.

Grasslands, grassy slopes, watersides, thickets, forests; 300–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific islands].

We (Huang and Ohashi) differ in our circumscriptions of *Desmodium heterocarpon*. One of us (Ohashi) recognizes eight infraspecific taxa, including *D. heterocarpon* subsp. *angustifolium* H. Ohashi, which corresponds to *D. reticulatum* in this treatment, and *D. heterocarpon* subsp. *heterocarpon*, comprising var. *heterocarpon* and var. *strigosum* (see J. Jap. Bot. 66: 14–25. 1991).

- 1a. Rachis with white, spreading, hooked hairs 16a. var. *heterocarpon*
1b. Rachis with dense yellowish or white, straight, appressed hairs 16b. var. *strigosum*

16a. *Desmodium heterocarpon* var. *heterocarpon*

假地豆(原变种) jia di dou (yuan bian zhong)

Hedysarum heterocarpon Linnaeus, Sp. Pl. 2: 747. 1753;

Desmodium buergeri Miquel; *D. heterocarpon* var. *buergeri* (Miquel) Hosokawa.

Rachis with white, spreading, hooked hairs. Fl. Jul–Oct, fr. Oct–Dec.

Grasslands, watersides, thickets, forests; 300–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific islands].

The whole plant is used medicinally for reducing fever and for treating contusions and strains.

16b. *Desmodium heterocarpon* var. *strigosum* Meeuwen, Reinwardtia 6: 95. 1961.

糙毛假地豆 cao mao jia di dou

Desmodium nervosum Vogel; *D. polycarpon* (Poiret) Candolle; *D. polycarpon* f. *hirsutum* Pampanini; *D. polycarpon* var. *trichocaulon* Baker; *D. siliquosum* (N. L. Burman) Candolle; *Hedysarum polycarpon* Poiret; *H. siliquosum* N. L. Burman.

Rachis with dense yellowish or white, straight, appressed hairs. Fl. Jul–Oct, fr. Oct–Nov.

Sparse thickets, grassy slopes, streamsides; 400–900 m. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Africa, Australia, Pacific islands].

17. *Desmodium strigillosum* Schindler var. ***pendenticarpum*** (C. Z. Gao & Q. R. Lai) P. H. Huang, Bull. Bot. Res., Harbin 18: 6. 1998.

垂果山蚂蝗 chui guo shan ma huang

Desmodium pendenticarpum C. Z. Gao & Q. R. Lai, Bull. Bot. Res., Harbin 9(4): 41. 1989.

Subshrubs, prostrate or ascending, to 1 m tall. Young branchlets white adpressed villous. Leaves 3-foliolate; petiole 0.7–1.8 cm, villous; leaflet blade elliptic, narrowly elliptic, or obovate-elliptic, 1.7–4 × 1.1–2 cm, abaxially densely white villous, adaxially glabrous, base broadly cuneate or rounded, apex rounded or obtuse. Racemes terminal, 2.5–7.5 cm; rachis villous, densely flowered. Pedicel 2.5–3 mm. Calyx ca. 2 mm. Corolla purple, ca. 6 mm; standard broadly ovate-orbicular or orbicular; wings auriculate at base; keel nearly spatulate, curved. Legume pendent, 0.9–2 cm × ca. 2 mm, adpressed gray-white villous, conferted, lower suture undulate, upper suture straight, 3–8-jointed. Fl. Aug, fr. Oct.

- Mountain slopes; ca. 100 m. S Guangxi.

One of us (Huang) treats this taxon as a variety of *Desmodium strigillosum* on account of the difference in indumentum of the branchlets, legumes, petioles, and abaxial surface of the leaflets, as well as the difference in corolla color between both taxa. However, one of us (Ohashi) prefers to treat *Desmodium pendenticarpum* as a synonym of *D. strigillosum* (see J. Jap. Bot. 70: 115. 1995).

The typical variety occurs in Cambodia, Indonesia, Laos, Myanmar, and Vietnam, and is introduced in Australia. It is an erect shrub or subshrub, to 60 cm tall, with branchlets, petioles, and leaflets abaxially densely appressed gray or silver silky hairy; rachis of the inflorescence

with dense appressed white or silver silky hairs, intermixed with hooked hairs; corolla blue; and legume densely minutely hooked hairy and long straight white hairy.

18. *Desmodium reticulatum* Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 4: 46. 1852.

显脉山绿豆 xian mai shan lu dou

Desmodium heterocarpon (Linnaeus) Candolle subsp. *angustifolium* H. Ohashi.

Subshrubs, erect, 30–60 cm tall. Leaves 3- or sometimes 1-foliolate near lower stem; petiole 1.5–3 cm, sparsely hairy; terminal leaflet blade narrowly ovate or ovate-elliptic to narrowly elliptic, 3–5 × 1–2 cm, lucid, abaxially adpressed pilose, adaxially glabrous, base slightly cordate, both ends obtuse or apex acute. Racemes terminal, 10–15 cm or longer; rachis densely hooked hairy, remotely 2-flowered at each node. Pedicel ca. 3 mm, glabrous. Calyx 4-lobed; lobes ca. as long as tube. Corolla pink or blue, ca. 6 mm; standard ovate-orbicular; wings obovate-oblong, wings and keel distinctly curved. Legume oblong, 1–2 cm × ca. 2.5 mm, subglabrous or hooked pubescent, lower suture undulate, upper suture straight, 3–7-jointed. Fl. Jun–Aug, fr. Sep–Oct.

Thickets, grassy slopes; 200–1300 m. Guangdong, Guangxi, Hainan, S Yunnan [Myanmar, Thailand, Vietnam].

This is a species similar to *Desmodium heterocarpon* but differs by the terminal leaflets usually narrowly elliptic, narrower, thicker, lucid adaxially, and the inflorescences longer and laxly flowered. One of us (Ohashi) considers it to be a subspecies of *D. heterocarpon* due to fundamental similarity in having erect or ascending loments comprising quadrate articles of 2.5–3 mm.

19. *Desmodium rubrum* (Loureiro) Candolle, Prodr. 2: 327. 1825.

赤山蚂蝗 chi shan ma huang

Ornithopus ruber Loureiro, Fl. Cochinch. 2: 452. 1790; *Desmodium carlesii* Schindler.

Subshrubs, prostrate or erect, 30–50 cm tall, much branched. Leaves often 1-foliolate, rarely 3-foliolate; petiole 4–10 mm, densely adpressed pubescent; blade elliptic, sometimes narrowly elliptic to nearly orbicular, 1–2.2 cm × 7–12 mm, abaxially sparsely adpressed pubescent, adaxially glabrous, base narrowly cordate, both ends obtuse or apex slightly emarginate. Racemes terminal, 5–25 cm; rachis yellow hooked hairy. Flowers extremely lax. Pedicel 2–3 mm, elongated to 7 mm at fruiting. Calyx often red; lobes nearly equal. Corolla blue or pink, 5–6 mm; standard obcordate, ca. as long as keel; wings obliquely ovate, shorter, auriculate, wholly clawed. Legume narrowly oblong, ca. 2 cm, slightly curved, glabrous, lower suture constricted, upper suture straight, 2–7-jointed; articles nearly quadrate, distinctly reticulate veined. Fl. and fr. Apr–Jun.

Wastelands, sandy areas at seashores; sea level. Guangdong, Guangxi, Hainan [Cambodia, Vietnam].

Because of its long taproot system, this plant is used for protecting riverbanks.

20. *Desmodium styracifolium* (Osbeck) Merrill, Amer. J. Bot. 3: 580. 1916.

广东金钱草 *guang dong jin qian cao*

Hedysarum styracifolium Osbeck, Dagb. Ostind. Resa, 247. 1757; *Desmodium capitatum* (N. L. Burman) Candolle; *D. retroflexum* (Linnaeus) Candolle; *H. capitatum* N. L. Burman; *H. retroflexum* Linnaeus; *Nicolsonia styracifolia* (Osbeck) Desvaux; *Pseudarthria capitata* (N. L. Burman) Hasskarl; *Uraria retroflexa* (Linnaeus) Drake.

Herbs, subshrublike, erect, 30–100 cm tall, much branched. Young branches with dense, white or yellowish hairs. Leaves often 1(or 3)-foliolate; petiole 1–2 cm, densely sericeous; blade orbicular or nearly so to broadly obovate, 2–4.5 × 2–4.5 cm, abaxially densely adpressed white sericeous, adaxially glabrous, lateral veins 8–10, base rounded or cordate, apex rounded or emarginate. Racemes short, 1–3 cm; rachis densely sericeous, densely flowered, 2-flowered at each node. Pedicel 2–3 mm, drooping at fruiting. Calyx 4-lobed; lobes nearly equal. Corolla purple-red, ca. 4 mm; standard obovate or nearly orbicular, clawed; wings obovate, shortly clawed; keel longer than wings, extremely curved, long clawed. Ovary linear, hairy. Legume 1–2 cm × ca. 2.5 mm, pubescent and minutely hooked hairy, lower suture undulate, upper suture straight, 3–6-jointed, reticulate veined. Fl. and fr. Jun–Sep.

Mountain slopes, grasslands, thickets; below 1000 m. Fujian, Guangdong, Guangxi, Hainan, Hubei, S Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam].

The whole plant is used medicinally for curing nephritis edema, urethra inflammation, jaundice, and irritation from nettles.

21. *Desmodium renifolium* (Linnaeus) Schindler, Repert. Spec. Nov. Regni Veg. 22: 262. 1926.

肾叶山蚂蝗 *shen ye shan ma huang*

Hedysarum renifolium Linnaeus, Syst. Nat., ed. 10, 2: 1169. 1759; *Desmodium reniforme* Candolle; *H. reniforme* Linnaeus, nom. illeg. superfl.

Subshrubs, 30–50 cm tall, much branched, often glabrous. Leaves 1-foliolate; petiole 1–2 cm; blade reniform or compressed rhombic, often broader than long, 1.5–3.5 × 2.5–5 cm, lateral veins 3 or 4, both ends truncate or base broadly cuneate or apex emarginate. Panicles terminal or racemes axillary, 5–15 cm, laxly flowered, 2–5-flowered at each node. Pedicel 2–8 mm, elongated to 1.3 cm at fruiting. Calyx 4-lobed; lobes triangular, ca. as long as tube. Corolla white to pale yellow or purple, ca. 5 mm; standard obovate, base broadly shortly clawed, apex slightly emarginate; wings narrowly oblong, long clawed; keel narrowly elliptic, long clawed. Stamens monadelphous, 3.2–4.2 mm. Ovary adpressed puberulent. Legume narrowly oblong, 2–3 × 0.25–0.4 cm, puberulent, becoming glabrescent, lower suture deeply or slightly constricted, upper suture straight or slightly constricted, 2–5-jointed. Fl. and fr. Sep–Nov.

Sunny grasslands, thickets, forest margins, broad-leaved forests; 100–1000 m. Hainan, Taiwan, S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam; Australia].

22. *Desmodium microphyllum* (Thunberg) Candolle, Prodr. 2: 337. 1825.

小叶三点金 *xiao ye san dian jin*

Hedysarum microphyllum Thunberg in Murray, Syst. Veg., ed. 14, 675. 1784; *Codoriocalyx microphyllum* (Thunberg) H. Ohashi; *Desmodium microphyllum* var. *longipilum* Ohwi; *D. parvifolium* Candolle; *D. parvifolium* f. *yunnanense* Pampanini.

Herbs, erect or prostrate, perennial, nearly glabrous. Leaves 3- or sometimes 1-foliolate; petiole 2–3 mm, when 1-foliolate 3–10 mm; leaflet blade narrowly obovate-elliptic or narrowly elliptic and 1–1.2 cm × 4–6 mm, or obovate to elliptic and 2–6 × 1.5–4 mm, both ends rounded. Racemes terminal or axillary, yellow-brown spreading pubescent, 6–10-flowered. Pedicel 5–8 mm. Calyx 5-parted; lobes linear-lanceolate, 3–4 × as long as tube. Corolla pink, nearly as long as calyx; standard obovate or obovate-orbicular, below middle attenuate, shortly clawed; wings obovate, auriculate and clawed; keel narrowly elliptic, longer than wings. Stamens diadelphous. Ovary pubescent. Legume ca. 12 × 3 mm, both surfaces shallowly dentiform, (2 or)3- or 4(or 5)-jointed; articles nearly orbicular, flat, minutely uncinately hairy and ciliate or glabrescent, reticulate veined. Fl. May–Sep, fr. Sep–Nov. $2n = 22$.

Wastelands, grasslands, thickets; 100–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; Australia].

The roots are used medicinally for reducing fever, relieving coughs, and dispelling phlegm.

One of us (Ohashi) considers this species as a member of *Codoriocalyx*, *C. microphyllum* (Thunberg) H. Ohashi (see J. Jap. Bot. 79: 109. 2004). This transfer is supported by molecular analysis, but here we follow the treatment in FRPS for convenience.

23. *Desmodium heterophyllum* (Willdenow) Candolle, Prodr. 2: 334. 1825.

异叶山蚂蝗 *yi ye shan ma huang*

Hedysarum heterophyllum Willdenow, Sp. Pl. 3: 1201. 1802.

Herbs, prostrate or ascending, 10–70 cm tall. Young parts spreading pubescent. Leaves 3-foliolate, often intermixed with 1-foliolate leaves on lower part; petiole 0.5–1.5 cm; terminal leaflet blade broadly elliptic or broadly elliptic-obovate, 1–3 × 0.8–1.5 cm, base obtuse, apex rounded or nearly truncate, often emarginate. Flowers solitary or binate in leaf axils or 2 or 3 scattered on rachis. Pedicel 1–2.5 cm. Calyx 5-parted; upper 2 lobes deeply incised near base, villous and minutely hooked hairy. Corolla purple-red to white, ca. 5 mm; standard broadly obovate; wings obovate or narrowly elliptic, shortly auriculate; keel slightly curved, shortly clawed. Stamens diadelphous. Ovary adpressed pubescent. Legume narrowly oblong, straight or curved, 1.2–1.8 cm × ca. 3 mm, lower suture deeply undulate, upper suture straight, 3–5-jointed, flat; articles broadly oblong or quadrate, 3.5–4 mm, glabrescent, reticulate veined. Fl. and fr. Jul–Oct. $2n = 22$.

Riversides, roadsides, field margins, grasslands; 200–500 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan

[Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Australia, Pacific islands].

24. *Desmodium triflorum* (Linnaeus) Candolle, Prodr. 2: 334. 1825.

三点金 san dian jin

Hedysarum triflorum Linnaeus, Sp. Pl. 2: 749. 1753; *Desmodium triflorum* var. *adpressum* Ohwi.

Herbs, perennial, prostrate, 10–50 cm tall, spreading pubescent. Leaves 3-foliolate; petiole ca. 5 mm; terminal leaflet blade obcordate, obtriangular, or obovate, 2.5–10 × 2.5–10 mm, base cuneate, apex truncate, slightly emarginate. Flowers solitary or 2 or 3 in leaf axils. Pedicel 3–8 mm, elongated to 1.3 cm at fruiting. Calyx densely villous, 5-parted; lobes narrowly lanceolate, longer than tube. Corolla purple-red, nearly as long as calyx; standard obcordate, base attenuate, long clawed; wings elliptic, shortly clawed; keel slightly falcate, longer than wings, curved, long clawed. Stamens diadelphous. Legume narrowly oblong, slightly falcate, flat, 5–12 × ca. 2.5 mm, lower suture undulate, upper suture straight, 3–5-jointed; articles nearly quadrate, with short, hooked hairs, reticulate veined. Fl. and fr. Jun–Oct. $2n = 22$.

Wastelands, grasslands, roadsides, riversides, sandy soils; 200–600 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan, Zhejiang [Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; tropics of Africa, Americas, SW Asia, Australia, Pacific islands].

The whole plant is used medicinally for inducing sweat and promoting digestion.

25. *Desmodium multiflorum* Candolle, Ann. Sci. Nat. (Paris) 4: 101. 1825.

饿蚂蝗 e ma huang

Desmodium dubium Lindley; *D. floribundum* (D. Don) Sweet ex G. Don; *D. mairei* Pampanini; *D. sambuense* (D. Don) Candolle; *Hedysarum floribundum* D. Don; *H. sambuense* D. Don.

Shrubs, erect, 1–2 m tall, yellow to white pubescent, becoming glabrescent. Leaves 3-foliolate; petiole 1.5–4 cm, densely tomentose; terminal leaflet blade elliptic or obovate, 5–10 × 3–6 cm, base cuneate or nearly rounded, apex obtuse or acute, mucronate. Inflorescences to 18 cm, terminal ones mostly paniculate, axillary ones mostly racemose; peduncle with dense antrorse sericeous and minute hooked hairs, often 2-flowered at each node. Pedicel ca. 5 mm. Calyx ca. 4.5 mm, densely hooked hairy; lobes ca. as long as tube. Corolla purple; standard elliptic, 0.8–1.4 cm, clawed; claw obovate, 8–11 mm; wings narrowly elliptic, 0.8–1.4 cm, clawed; keel 7–10 mm, long clawed, not auriculate at base. Stamens monadelphous. Legume 1.5–2.4 cm, lower suture crenate, upper suture nearly straight or slightly undulate, 4–7-jointed; articles obovate, 3–4 × ca. 3 mm, densely adpressed brown sericeous. Fl. Jul–Sep, fr. Aug–Oct. $2n = 22$.

Mountain slopes, grasslands, forest margins; 500–2800 m. Fujian, N Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Kashmir, Laos, Myanmar, Nepal, Thailand, Vietnam].

The flowers and branches are used medicinally for reducing fever by inducing sweat.

26. *Desmodium amethystinum* Dunn, Gard. Chron., ser. 3, 32: 210. 1902.

紫水晶山蚂蝗 zi shui jing shan ma huang

Shrubs, to 2 m tall. Young branches angular, densely white or brown velutinous. Leaves 3-foliolate; petiole 1.5–5 cm; leaflet blade ovate or elliptic, abaxially white or brown velutinous, adaxially velutinous then becoming sparsely so, base usually cuneately obtuse, margin entire, apex acute or mucronate, terminal leaflet 5–12 × 3.5–6.5 cm, lateral veins 8–10 on each side of midvein, reaching margin. Inflorescences 15–25 cm, terminal ones paniculate, axillary ones racemose, 2 (or 3)-flowered at each node. Calyx 2.5–3 mm, 4-lobed. Corolla amethyst; standard obovate, 8.5–10 mm, base cuneate, apex slightly emarginate; wings longer than keel petal, 10.5–11.5 mm, auriculate at lamina base; keel 8–10.5 mm, apex acute. Stamens 8.5–9 mm. Legume flat, linear, 18–28 × 4–7 mm, glabrous, upper suture nearly straight, lower suture indented, 6- or 7-jointed.

Mountain thickets; ca. 1800 m. Yunnan [Thailand].

27. *Desmodium elegans* Candolle, Ann. Sci. Nat. (Paris) 4: 100. 1825.

圆锥山蚂蝗 yuan zhui shan ma huang

Shrubs, much branched, 1–2 m tall. Branches glabrescent. Leaves 3-foliolate; petiole 2–4 cm; leaflet blade variable in shape and size, nearly ovate, ovate-lanceolate, ovate-elliptic, broadly ovate, rhombic, or orbicular-rhombic, 2–7 × 1.2–5 cm, base obliquely obtuse or cuneate, margin entire or shallowly undulate, apex usually acute to acuminate. Inflorescences 5–20 cm or longer, terminal ones mostly paniculate, axillary ones mostly racemose, often 2- or 3-flowered at each node. Calyx 3–4 mm, 4-lobed; lower calyx lobes longer or shorter than tube. Corolla purple or purple-red, 0.9–1.7 cm; standard broadly elliptic or obovate, base cuneate, apex slightly emarginate; wings and keel clawed, wings auriculate at base. Stamens 0.7–1.3 cm. Legume flat, linear, 3–5 × 0.4–0.5 cm, hairy, lower suture crenate, upper suture nearly straight, 4–6-jointed. $2n = 22$.

Forest margins, forests, thickets, mountain slopes, rocky places, roadsides, ditches; 1000–4000 m. Gansu, NW Guizhou, SW Shaanxi, Sichuan, Xizang, Yunnan [Afghanistan, Bhutan, NE and SW India, Kashmir, Nepal, Pakistan].

- 1a. Leaflets densely spreading white tomentose and sericeous abaxially; legume densely hairy as leaflet abaxially 27c. var. *handellii*
- 1b. Leaflets densely or sparsely pubescent to glabrous abaxially; legume sparsely adpressed pubescent or puberulent.
 - 2a. Terminal leaflet blade ovate-elliptic, broadly ovate, rhombic, or orbicular-rhombic; pedicel 4–10 mm; lower calyx lobes shorter than tube 27a. var. *elegans*
 - 2b. Terminal leaflet blade narrowly

ovate or ovate-lanceolate; pedicel
13–22 mm; lower calyx lobes
longer than tube 27b. var. *wolohoense*

27a. *Desmodium elegans* var. *elegans*

圆锥山蚂蝗(原变种) yuan zhui shan ma huang (yuan bian
zhong)

Desmodium cinerascens Franchet; *D. cinerascens* var. *longipes* Pampanini; *D. cinerascens* var. *microphyllum* Franchet; *D. elegans* f. *albiflorum* (P. C. Li) H. Ohashi; *D. elegans* var. *albiflorum* P. C. Li; *D. esquirolii* H. Léveillé; *D. forrestii* Schindler; *D. franchetii* Rehder; *D. glaucophyllum* Pampanini; *D. rhabdocladium* Franchet; *D. spicatum* Rehder; *D. tiliifolium* (D. Don) Wallich; *D. tiliifolium* var. *potaninii* Schindler; *D. tiliifolium* f. *rhabdocladium* (Franchet) Schindler; *D. tiliifolium* var. *subtomentosum* E. Peter; *Hedysarum tiliifolium* D. Don.

Terminal leaflet blade ovate-elliptic, broadly ovate, rhombic, or orbicular-rhombic, 2–7 × 1.5–5 cm, abaxially densely or sparsely pubescent to nearly glabrous. Pedicel 4–10 mm. Lower calyx lobes shorter than tube. Legume sparsely adpressed pubescent. Fl. and fr. Jun–Oct. $2n = 22$.

Margins of *Pinus-Quercus* forests, mountain slopes, roadsides, ditches; 1000–3700 m. Gansu, NW Guizhou, SW Shaanxi, Sichuan, Xizang, NW Yunnan [Afghanistan, Bhutan, NE and SW India, Kashmir, Nepal, Pakistan].

A white-flowered form has been recorded as *Desmodium elegans* f. *albiflorum* (P. C. Li) H. Ohashi (J. Jap. Bot. 70: 113. 1995; *D. elegans* var. *albiflorum* P. C. Li, Fl. Xizang. 2: 892. 1985).

27b. *Desmodium elegans* var. *wolohoense* (Schindler) H. Ohashi in H. Hara, Fl. E. Himalaya 2: 297. 1971.

川南山蚂蝗 chuan nan shan ma huang

Desmodium wolohoense Schindler, Repert. Spec. Nov. Regni Veg. 21: 1. 1925; *D. elegans* subsp. *wolohoense* (Schindler) H. Ohashi.

Terminal leaflet blade narrowly ovate or ovate-lanceolate, 3–4 × 1.2–2 cm, abaxially densely or sparsely pubescent or nearly glabrous. Pedicel 1.3–2.2 cm at anthesis, nearly glabrous. Lower calyx lobes longer than tube. Legume sparsely puberulent, glabrous at maturity.

• Forest margins, thickets; 2900–4000 m. Sichuan, NW Yunnan.

One of us (Ohashi) recognizes this taxon as a geographical subspecies (see J. Jap. Bot. 70: 113. 1995).

27c. *Desmodium elegans* var. *handelii* (Schindler) H. Ohashi in H. Hara, Fl. E. Himalaya 2: 297. 1971.

盐源山蚂蝗 yan yuan shan ma huang

Desmodium handelii Schindler, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 234. 1925.

Terminal leaflet blade ovate-elliptic, broadly ovate, or rhombic, 2–7 × 1.5–5 cm, abaxially densely spreading white tomentose and sericeous. Pedicel 4–10 mm. Lower calyx lobes longer than tube. Legume densely hairy as leaflet abaxially, ciliate.

• Mountain slopes, rocky places, forests; 1700–3100 m. Sichuan, Xizang, Yunnan.

28. *Desmodium callianthum* Franchet, Pl. Delavay. 173. 1890.

美花山蚂蝗 mei hua shan ma huang

Desmodium elegans Candolle subsp. *callianthum* (Franchet) H. Ohashi; *D. elegans* var. *callianthum* (Franchet) P. C. Li.

Shrubs, to 2 m tall, much branched, glabrescent. Leaves 3-foliolate; petiole 1–3 cm, sparsely pubescent or nearly glabrous; leaflet blade ovate-rhombic or ovate, 1.3–4 × 1–3 cm, base broadly cuneate, slightly oblique, apex obtuse-acute, mucronate. Racemes terminal or branched in panicles, 15–22 cm, 2–4-flowered at each node, internodes ca. 1 cm. Pedicel filiform, glabrous or nearly so. Calyx ca. 3 mm, 4-lobed; lobes triangular. Corolla purple or pink to white, 8–10 mm; standard elliptic, base clawed, apex rounded; wings auriculate, clawed; keel with base auriculate and clawed, apex mucronate. Stamens 7–8 mm. Pistil 8–9 mm. Legume 3–5 × ca. 0.5 cm, flat, slightly curved, nearly glabrous or puberulent, lower suture constricted and crenate, upper suture slightly constricted between articles, 5- or 6-jointed, reticulate veined. Fl. Jun–Aug, fr. Aug–Oct.

• Mountain slopes, roadsides, thickets, forests, ditches, rocky places in river valleys; 1700–3300 m. SW and W Sichuan, SE Xizang, NW Yunnan.

One of us (Ohashi, Bull. Univ. Mus. Univ. Tokyo 2: 291. 1971; J. Jap. Bot. 70: 113. 1995) recognizes this species as a subspecies of *Desmodium elegans* due to continuous ranges of variation in morphology, including the shape of the floral petals.

29. *Desmodium stenophyllum* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 15. 1910.

狭叶山蚂蝗 xia ye shan ma huang

Desmodium elegans Candolle subsp. *stenophyllum* (Pampanini) H. Ohashi; *D. tiliifolium* (D. Don) Wallich var. *stenophyllum* (Pampanini) Schindler.

Shrubs, 1–2 m tall, glabrous except for hairy petiolules. Leaves 3-foliolate; petiole 2–5 cm; leaflet blade lanceolate or lanceolate-linear, 6–13 × 1.2–3 cm, base broadly cuneate or nearly rounded, apex acuminate. Racemes terminal or at lower parts 2- or 3-branched in terminal panicles, ca. 20 cm, 1–3-flowered at each node. Pedicel 1–1.2 cm, filiform. Calyx ca. 4 mm, 4-lobed; upper lobes connate, longer than lower ones. Corolla purple or purple-red, 1.2–1.3 cm; standard elliptic or broadly elliptic, base shortly clawed, apex emarginate; wings oblong-falcate, equal to keel, auriculate and clawed. Stamens ca. 1.2 cm. Pistil ca. 1.2 cm. Legume flat, slightly curved, slightly falcate, 4.5–6.5 × ca. 0.5 cm, glabrous, lower suture constricted and crenate between articles, upper suture slightly straight, 6- or 7-jointed; articles ca. 1 cm, slightly reticulate veined. Fl. and fr. Aug–Sep.

• Mountain slopes, thickets, riversides; 2300–2700 m. Yunnan.

One of us (Ohashi, J. Jap. Bot. 70: 115. 1995) recognizes this species as a rheophyte found along streams and supposedly having evolved from *Desmodium elegans*.

30. *Desmodium megaphyllum* Zollinger & Moritz, *Natuur-Geneesk. Arch. Ned.-Indie* 3: 58. 1846.

滇南山蚂蝗 dian nan shan ma huang

Shrubs, 1–4 m tall. Young branches white pubescent, glabrescent. Leaves 3-foliolate; petiole 3–7 cm; terminal leaflet blade ovate or broadly ovate, occasionally rhombic or nearly orbicular, 8–15 × 6–9 cm, abaxially densely sericeous or sparsely pubescent, adaxially puberulent, base oblique, margin entire to shallowly crenate. Inflorescences 10–40 cm, terminal ones mostly paniculate, axillary ones racemose or paniculate, 2- or 3-flowered at each node; peduncle, pedicel, and calyx hairy or nearly glabrous. Pedicel 4–11 mm. Calyx 4-lobed. Corolla purple, 1–1.3 cm; standard elliptic or broadly elliptic, clawed; wings and keel long clawed; keel often hooked hairy at apex. Stamens ca. 1 cm. Ovary adpressed pubescent. Legume flat, both sutures shallowly constricted, 6–8-jointed; articles 6–7 × 5–7 mm or larger, with minute hooked hairs, sometimes intermixed with straight hairs or glabrous.

Mountain slopes, forest margins, forests; 700–1900 m. S and SE Yunnan [India (Assam), Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

- 1a. Leaflet densely sericeous abaxially; peduncle and pedicel with spreading pubescence and intermixed hooked hairs, calyx sericeous; articles 6–7 × 5–7 mm, with minute hooked hairs, sometimes intermixed with straight hairs 30a. var. *megaphyllum*
- 1b. Leaflet sparsely pubescent abaxially; peduncle, pedicel, and calyx sparsely hairy or nearly glabrous; articles 8–10 × 7–8 mm, glabrescent or glabrous 30b. var. *glabrescens*

30a. *Desmodium megaphyllum* var. *megaphyllum*

滇南山蚂蝗(原变种) dian nan shan ma huang (yuan bian zhong)

Desmodium karenium Kurz; *D. prainii* Schindler, nom. illeg. superfl.

Leaflets densely sericeous abaxially. Peduncle and pedicel with spreading pubescence and intermixed hooked hairs. Pedicel 4–10 mm. Calyx adpressed sericeous. Articles 6–7 × 5–7 mm, with minute hooked hairs, sometimes intermixed with straight hairs, nearly glabrous at maturity. Fl. and fr. Jun–Nov.

Mountain slopes, forest margins, forests; 700–1900 m. S and SE Yunnan [India (Assam), Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

30b. *Desmodium megaphyllum* var. *glabrescens* Prain, *J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist.* 66: 399. 1897.

无毛滇南山蚂蝗 wu mao dian nan shan ma huang

Desmodium prainii var. *glabrescens* (Prain) Schindler.

Leaflets sparsely pubescent abaxially. Peduncle, pedicel, and calyx sparsely hairy or nearly glabrous. Pedicel 0.9–1.1 cm.

Articles 8–10 × 7–8 mm, glabrescent or glabrous. Fl. and fr. Jun–Nov.

Dense forests; ca. 1900 m. S Yunnan [Myanmar].

31. *Desmodium yunnanense* Franchet, *Pl. Delavay.* 172. 1890.

云南山蚂蝗 yun nan shan ma huang

Desmodium praestans Forrest; *D. rockii* Schindler; *D. yunnanense* subsp. *praestans* (Forrest) H. Ohashi; *D. yunnanense* var. *rockii* (Schindler) Y. C. Yang & P. H. Huang.

Shrubs, 1.2–3 m tall, much branched. Young branches densely white or gray tomentose, becoming glabrous. Leaves 3- or 1-foliolate; petiole 1–4 cm, hairy as young branches; terminal leaflet blade nearly orbicular, ovate, or obovate, 5–22 × 5–17 cm, abaxially densely gray or white tomentose, adaxially sparsely pubescent, margin entire or undulate. Panicles terminal, large, 16–27 cm; rachis shortly tomentose, 2–6-flowered at each node. Pedicel 0.6–1 cm, tomentose. Calyx 3–4.5 mm, 4-lobed; lobes ca. as long as tube or shorter. Corolla pink or purple, 1–1.3 cm; standard nearly orbicular or broadly elliptic, base shortly clawed, apex concave or emarginate; wings auriculate and clawed; keel shorter, clawed. Ovary pubescent. Legume compressed, 4–6 × ca. 0.5 cm, hairy when young, becoming glabrous, lower suture undulate, upper suture nearly straight, 4–7-jointed; articles 7–9 mm, reticulate veined. Fl. Aug–Sep, fr. Sep–Oct. $2n = 22^*$.

• Gravelly places, wastelands, grassy slopes, thickets, margins of *Pinus-Quercus* forests; 1000–2200 m. SW Sichuan, NW Yunnan.

32. *Desmodium sequax* Wallich, *Pl. Asiat. Rar.* 2: 46. 1831.

长波叶山蚂蝗 chang bo ye shan ma huang

Desmodium dasylobum Miquel; *D. hamulatum* Franchet; *D. sequax* var. *sinuatum* (Miquel) Hosokawa; *D. sinuatum* (Miquel) Blume ex Baker; *D. strangulatum* Wight & Arnott var. *sinuatum* Miquel; *Meibomia sinuata* (Miquel) Kuntze.

Shrubs, erect, 1–2 m tall, much branched. Young branches rust-colored pubescent, sometimes intermixed with minute hooked hairs. Leaves 3-foliolate; petiole 2–3.5 cm, hairy as young branches; terminal leaflet blade ovate-elliptic or orbicular-rhombic, 4–10 × 4–6 cm, abaxially adpressed pubescent and intermixed with minute hooked hairs, adaxially densely puberulent or glabrescent, base cuneate to obtuse, margin undulate above middle, apex acute. Racemes terminal and axillary or usually terminal panicles, to 12 cm; rachis densely spreading or upward hirsute or minutely tomentose, 2-flowered at each node. Pedicel 3–5 mm, slightly elongated at fruiting. Calyx ca. 3 mm; lobes ca. as long as tube. Corolla purple, ca. 8 mm; standard elliptic to broadly elliptic; wings narrowly elliptic, auriculate, clawed; keel long clawed. Stamens monadelphous. Legume moniliform, 3–4.5 × ca. 0.3 cm, with dense rust-colored or brown minute hooked hairs, both sutures constricted, 6–10-jointed; articles nearly quadrate. Fl. Jul–Sep, fr. Sep–Nov. $2n = 22$.

Grassy slopes, forest margins; 1000–2800 m. NW Guangdong, Guangxi, Guizhou, Hubei, Hunan, ?Jiangsu, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam].

