

16. Tribe INDIGOFERAE

木蓝族 mu lan zu

Gao Xinfen (高信芬), Sun Hang (孙航); Brian D. Schrire

Shrubs or herbs, often gray or silvery with medifixed (T-shaped) trichomes. Stipules usually small. Leaves generally imparipinnate, sometimes 3-foliolate, 1-foliolate, or leaflets absent; stipels present or absent. Flowers in axillary racemes; bracteoles absent. Corolla papilionaceous, usually reddish or purple but sometimes white or yellow. Stamens mostly diadelphous, vexillary filament free from base or rarely connate with others into a sheath split above or a closed tube; anthers uniform or dissimilar, mostly gland-tipped. Ovary with 1 to many ovules; style glabrous. Legume 2-valved, septate between seeds, rarely jointed or leathery, turgid and indehiscent. Seeds globose to rectangular, without a caruncle.

Six genera and ca. 800 species: tropical and subtropical regions worldwide but mainly in tropical Africa and Asia; two genera (one introduced) and 80 species (45 endemic, three introduced) in China.

- 1a. Leaflet blade margins entire; legume less than 3 mm wide, erect, spreading, or reflexed, not longitudinally ridged 63. *Indigofera*
1b. Leaflet blade margins dentate; legume 3–8 mm wide, erect, longitudinally ridged 64. *Cyamopsis*

63. INDIGOFERA Linnaeus, Sp. Pl. 2: 751. 1753.

木蓝属 mu lan shu

Gao Xinfen (高信芬); Brian D. Schrire

Shrubs, shrublets, perennial herbs, or rarely annual herbs or small trees; trichomes typically medifixed (T-shaped), equally to very unequally 2-branched and sometimes crisped, or rarely simple multicellular hairs present with glandular tips. Stipules persistent or caducous. Leaves usually imparipinnate but for some species simple or reduced to 1 leaflet; stipels present or absent; leaflet blades usually opposite but sometimes subopposite or alternate, rarely with glands, margin entire. Racemes axillary; bracts usually caducous. Calyx campanulate or cup-shaped; teeth 5, subequal or abaxial one longer. Corolla usually reddish, sometimes white or yellow; standard usually covered outside with appressed trichomes but occasionally glabrous, base shortly clawed, apex usually obtuse to emarginate and mucronate; wings narrow, base auricled; keel falcate or spatulate, with spur adnate to wings. Stamens 10, diadelphous, only vexillary one free; anthers uniform, basifixed or subbasifixed, sometimes both ends hairy, apex apiculate; pollen 3-colporate. Ovary sessile, with 1 to many ovules; style linear, usually glabrous; stigma capitate. Legume linear, oblong, or ovoid, cylindrical or 4-sided in cross section, 2-valved, septate, dehiscent; endocarp often spotted with tannin deposits. Seeds globose to rectangular; hilum small; cotyledons unequal; radicle oblique.

About 750 species: tropics and subtropics worldwide; 79 species (45 endemic, two introduced) in China.

A single collection has been seen from Yunnan of what appears to be an additional species closely related to *Indigofera laxiflora* Craib (Kew Bull. 1912: 148. 1912), otherwise only known from Thailand.

- 1a. Leaves simple or 1-foliolate.
2a. Leaf blade abaxially with disk-shaped or dotlike glands.
3a. Main root not tuberous; leaf blade ovate-elliptic to obovate-orbicular, abaxially with small dotlike pearl bodies, medifixed trichomes perpendicular to margin on both surfaces; legume falcate, adaxial suture echinate 1. *I. nummulariifolia*
3b. Main root tuberous; leaf blade narrowly obovate-lanceolate, abaxially with sparse disk-shaped glands, medifixed trichomes \pm parallel to margin on both surfaces; legume straight, sutures narrowly winged, not echinate 2. *I. squalida*
2b. Leaf or leaflet blade abaxially without any glands or pearl bodies.
4a. Leaf or leaflet blade 0.4–3 \times 0.3–0.6 cm; legume globose to shortly oblong, 1- or 2(or 3)-seeded.
5a. Leaf or leaflet blade usually linear but sometimes elliptic to ovate-elliptic, adaxially with appressed medifixed trichomes; legume 1-seeded 5. *I. linifolia*
5b. Leaf blade oblong to cordate, adaxially with long spreading white subbasifixed trichomes; legume (1 or)2-seeded 6. *I. cordifolia*
4b. Leaf or leaflet blade 3–10 \times 2–5.5 cm; legume cylindrical, more than 3-seeded.
6a. Leaf or leaflet blade abaxially with very unequally 2-branched trichomes; corolla standard outside with stiff brown 2-branched trichomes; stamens 8–10 mm 7. *I. caloneura*
6b. Leaflet blade abaxially with medifixed trichomes; corolla standard outside with soft white 2-branched trichomes; stamens 6–7 mm 8. *I. shipingensis*

Extensive contributions on *Indigofera* were also received from Munivenkatappa Sanjappa, Central National Herbarium, Botanical Survey of India, P.O. Botanic Garden, Howrah, Kolkata 711 103, West Bengal, India.

- 1b. Leaves 3- or more foliolate.
- 7a. Leaves 3-foliolate, leaflet blades abaxially with red to brown disk-shaped glands; legume sutures usually narrowly winged.
- 8a. Branches trailing; inflorescence longer than leaf; pedicel 3–5 mm 3. *I. pedicellata*
- 8b. Branches erect to ascending; inflorescence shorter than leaf; pedicel 0.5–1 mm 4. *I. trifoliata*
- 7b. Leaves more than 3-foliolate, or if 3-foliolate then leaflet blades without glands; legume sutures not narrowly winged.
- 9a. All leaflets alternate.
- 10a. Racemes 0.5–3 cm; peduncle to 8 mm or absent.
- 11a. Leaflet blades obovate to narrowly obovate; legume oblong, 0.3–0.8 cm, 1–3-seeded 9. *I. linnaei*
- 11b. Leaflet blades linear to sometimes narrowly oblong; legume linear, 1.5–2.5 cm, 7–10-seeded 11. *I. litoralis*
- 10b. Racemes 1.8–16 cm; peduncle 9–18 mm.
- 12a. Leaves 5–9-foliolate; stamens 4–5 mm 10. *I. hendecaphylla*
- 12b. Leaves 4–6-foliolate; stamens 3–3.5 mm 12. *I. taiwaniana*
- 9b. Leaflets opposite or subopposite.
- 13a. Stems, pedicels, and calyces with gland-tipped trichomes.
- 14a. Leaflet blades 0.4–1.4(–1.8) cm; racemes 2–6(–8) cm; stamens 3–4 mm 13. *I. colutea*
- 14b. Leaflet blades 1.5–3 cm; racemes 12–18 cm; stamens 5.5–7 mm.
- 15a. Calyx 3–4.5 mm, softly pubescent, lobes more than 2 × as long as tube and filiform; leaflet blades without gland-tipped trichomes; petioles and pedicels pilose 14. *I. dolichochaete*
- 15b. Calyx 2–2.5(–3) mm, strigose, lobes up to 2 × length of tube and linear-lanceolate; leaflet blades with gland-tipped trichomes along margin and abaxial midvein; petioles and pedicels tomentose 15. *I. scabrida*
- 13b. Plants without gland-tipped trichomes.
- 16a. Stems, leaf rachises, and peduncles with ± spreading, basifixed to medifixed trichomes or crisped multicellular trichomes.
- 17a. Stems, leaf rachises, and leaflet blade abaxial surfaces with spreading flattened and crinkly multicellular trichomes; stamens 1.2–1.3 cm 26. *I. parkesii*
- 17b. Stems, leaf rachises, and peduncles with spreading basifixed to medifixed 2-branched trichomes; stamens either less than 1.2 cm or greater than 1.3 cm (but may fall within 1.2–1.3 cm for *I. dumetorum*, *I. esquirolii*, and *I. penduloides*).
- 18a. Corolla standard 4–5 mm; calyx teeth 3–5 × as long as tube; corolla ± as long as calyx; stamens 3–4.5 mm 37. *I. hirsuta*
- 18b. Corolla standard 6 mm or more; calyx teeth less than 3 × as long as tube; corolla distinctly exerted from calyx; stamens (5.5–)6 mm or longer.
- 19a. Racemes 2–6 cm.
- 20a. Stamens 1.4–1.5 cm; flowers usually opening before leaves; leaves 11–19(–23)-foliolate 39. *I. pampaniniana*
- 20b. Stamens 1 cm or less; flowers opening after leaves; leaves 3–13(or 15)-foliolate.
- 21a. Dwarf shrubs or shrublets; stems slender, with dense spreading long stiff brown trichomes and submedifixed 2-branched trichomes; stamens 9–10 mm 38. *I. argutidens*
- 21b. Shrubs; stems robust, with spreading or subspreading mixed appressed pale brown or white 2-branched trichomes; stamens 5.5–7 mm 53. *I. balfouriana*
- 19b. Racemes (5–)6–45 cm (5–9 cm in *I. cylindracea*, 5–13 cm in *I. megaphylla*, and 5–15 cm in *I. dosua*).
- 22a. Leaflet blades 0.7–2 cm.
- 23a. Shrubs 1–3 m tall; pedicel ca. 1.5 mm; stamens 9–10.5 mm 42. *I. stachyodes*
- 23b. Shrubs 1 m tall or less; pedicel 3–6 mm; stamens 6.5–8 mm (sometimes to 9 mm in *I. dosua*).
- 24a. Ovary and legume hairy; leaves ± sessile 43. *I. dosua*
- 24b. Ovary and legume glabrous; leaves with a 5–10 mm petiole.
- 25a. Stipules caducous, 2–4 mm; leaves (9 or)11–15-foliolate; racemes 5–9 cm 46. *I. cylindracea*
- 25b. Stipules persistent, 5–10 mm; leaves 17–25-foliolate; racemes ca. 16 cm 47. *I. lacei*
- 22b. Leaflet blades 2–8 cm.
- 26a. Corolla purple or pink (not stated for *I. penduloides*).
- 27a. Stamens 0.5–0.6 cm; peduncle 0.3–0.5 cm; pedicel 0.5–1 mm; ovary densely pubescent; leaves (1 or)3- or 5(or 7)-foliolate 52. *I. megaphylla*
- 27b. Stamens 1.1–1.4 cm; peduncle 3.5–6 cm; pedicel 2–3 mm; ovary glabrous.
- 28a. Leaves 17–23-foliolate; stamens 1.1–1.2 cm 44. *I. penduloides*

- 28b. Leaves 5–9-foliolate; stamens 1.25–1.4 cm 45. *I. jikongensis*
- 26b. Corolla white or yellowish.
- 29a. Leaflet blades adaxially glabrous; calyx 2–3 mm; stamens 0.6–0.8 cm 36. *I. caudata*
- 29b. Leaflet blades adaxially hairy; calyx 4.5–6 mm; stamens 1.2–1.6 cm.
- 30a. Leaves 9–15-foliolate; leaflet blade apices rounded to truncate; peduncle 1–1.3 cm; legume ca. 4.5 cm 40. *I. esquirolii*
- 30b. Leaves 5–9-foliolate; leaflet blade apices obtuse to acute; peduncle 2–3 cm; legume ca. 7 cm 41. *I. dumetorum*
- 16b. Stems, leaf rachises, and peduncles glabrous or with appressed or appressed and spreading medifixed trichomes.
- 31a. Leaves 3- or 5-foliolate (5–9-foliolate in *I. balfouriana* and *I. muliensis*).
- 32a. Stems, petioles, and peduncles glabrous; stamens 5–6.5 mm 51. *I. muliensis*
- 32b. Stems, petioles, and peduncles with 2-branched trichomes; stamens 6–9 mm.
- 33a. Leaves ca. 2 cm, 3-foliolate; pedicel ca. 0.8 mm; stamens 6.5–7.5 mm 79. *I. neosericipetala*
- 33b. Leaves 3–9 cm, 3–9-foliolate; pedicel 1–3 mm.
- 34a. Stems, petioles, and peduncles with both appressed and spreading 2-branched trichomes; stamens 6–7 mm 53. *I. balfouriana*
- 34b. Stems, petioles, and peduncles with only appressed 2-branched trichomes; stamens 7–9 mm.
- 35a. Subshrubs; leaflets with appressed trichomes; corolla purplish red to purple, standard 6.5–8 mm; stamens 7–8 mm; ovary glabrous 54. *I. sticta*
- 35b. Shrubs; leaflets with spreading 2-branched trichomes especially dense and white; corolla pinkish, standard 8.5–11 mm; stamens 8–9 mm; ovary densely appressed white hispid 55. *I. dichroa*
- 31b. Leaves 5–50-foliolate (5- or 7-foliolate in *I. byobiensis*, 5–9-foliolate in *I. muliensis*, *I. calcicola*, and *I. lenticellata*).
- 36a. Ovary and legume glabrous (legume glabrescent in *I. hamiltonii* and *I. atropurpurea*).
- 37a. Corolla standard outside glabrous or with trichomes only at margin (glabrescent in *I. hamiltonii*).
- 38a. Bracts to 3.5 mm wide, boat-shaped; racemes sessile or subsessile, with persistent bud scales at base 23. *I. cassioides*
- 38b. Bracts 1–1.5 mm wide, ovate, ovate-lanceolate, or linear-lanceolate; racemes pedunculate, without persistent bud scales at base.
- 39a. Stamens 1.2–1.4 cm; pedicel 3–5 mm 16. *I. kirilowii*
- 39b. Stamens 0.5–0.8 cm; pedicel 1–2 mm.
- 40a. Leaves 3- or 5(–11)-foliolate, to 2.2 × 1.2 cm; racemes much longer than leaves 24. *I. hamiltonii*
- 40b. Leaves (7–)11–19(or 21)-foliolate, to 6.5 × 2.5 cm; racemes equal to slightly longer than leaves 25. *I. atropurpurea*
- 37b. Corolla standard outside hairy.
- 41a. Bracts 4–6 × 2–3 mm, cuspidate.
- 42a. Subshrubs to 0.9 m; stems and branches mostly glabrous; leaflet blades 1.2–2.5(–3.2) × 0.6–1 cm, adaxially hairy; stamens 7–8 mm 21. *I. bracteata*
- 42b. Robust shrubs 1–3 m; stems and branches with appressed medifixed trichomes; leaflet blades 1.2–6.5(–8) × 0.7–3.5(–4.5) cm, adaxially glabrous; stamens 8–10 mm 22. *I. hebetata*
- 41b. Bracts 1–5 × 1–1.5 mm, linear-lanceolate to ovate.
- 43a. Leaves (13 or)15–19-foliolate; leaflet blades 0.8–1.3 cm wide; pedicel 1–1.5 mm 60. *I. delavayi*
- 43b. Leaves 5–15-foliolate (if to 23 leaflets in *I. decora*, then pedicels 3–6 mm); leaflet blades to 3 cm wide; pedicel 2–6 mm.
- 44a. Leaflet blades with appressed medifixed trichomes on both surfaces; stamens (11–)12–15 mm.
- 45a. Leaflet blades usually ovate-lanceolate, ovate-oblong, or lanceolate, apex acuminate, acute, or rarely obtuse; calyx 2.5–3.5 mm; stipels ca. 1.5 mm 18. *I. decora*
- 45b. Leaflet blades elliptic to ovate-elliptic, apex obtuse; calyx 4–4.5 mm; stipels 2–4 mm 20. *I. carlesii*
- 44b. Leaflet blades adaxially glabrous.
- 46a. Stamens 0.7–0.9 cm 17. *I. fortunei*
- 46b. Stamens 1.1–1.4 cm.
- 47a. Leaflet blades ovate-lanceolate, ovate-oblong, or lanceolate, 2–7.5(–10) cm; bracts linear-lanceolate, ca. 3 mm; pedicel 3–6 mm 18. *I. decora*
- 47b. Leaflet blades ovate, ovate-rhombic, or suborbicular, 1.3–2.5 cm; bracts ovate-lanceolate, 2–2.5 mm; pedicel ca. 2.5 mm 19. *I. venulosa*
- 36b. Ovary and legume hairy.

- 48a. Leaflet blades adaxially ± glabrous (adaxially with sparse trichomes in *I. bungeana*, adaxially glabrous or subglabrous in *I. delavayi*, adaxially glabrous except for isolated appressed hairs along midrib in *I. sensitiva*).
- 49a. Stamens (1.3–)1.4–1.7 cm; legume 4–5(–6) cm 60. *I. delavayi*
- 49b. Stamens 0.3–0.8 cm; legume 2–3.5 cm.
- 50a. Stems, petioles, and peduncles glabrous 51. *I. muliensis*
- 50b. Stems, petioles, and peduncles sparsely hairy.
- 51a. Leaves 3–9-foliolate.
- 52a. Shrubs to 1 m tall; leaves 2.5–5 cm; leaflet blades 5–15(–25) × 3–10(–15) mm; peduncle 1–5 mm 57. *I. bungeana*
- 52b. Subshrubs to 30 cm tall; leaves 0.6–1.5(–2) cm; leaflet blades 3.5–6 × 1.5–2.5 mm; peduncle 9–15 mm 64. *I. chaetodonta*
- 51b. Leaves 11–31-foliolate.
- 53a. Leaves 21–31-foliolate; stamens 3–4 mm 63. *I. sensitiva*
- 53b. Leaves 11–21-foliolate; stamens 5–5.5 mm 65. *I. mengtzeana*
- 48b. Leaflet blades adaxially with appressed 2-branched trichomes.
- 54a. Corolla standard outside with appressed stiff brown trichomes.
- 55a. Stamens 13–16 mm 33. *I. sootepensis*
- 55b. Stamens 3–7 mm.
- 56a. Corolla standard with tuft of hairs inside at base; legume 1.7–2.8 cm 31. *I. nigrescens*
- 56b. Corolla standard without tuft of hairs inside; legume 2–9 cm.
- 57a. Legume deflexed; stamens 3–5 mm.
- 58a. Legume 10–15 × 2.5–3 mm, falcate; stamens 3–4 mm 27. *I. suffruticosa*
- 58b. Legume 25–30 × 1–2(–2.2) mm, straight to semicircular but never falcate; stamens 4–5 mm 30. *I. tinctoria*
- 57b. Legume spreading to erect; stamens 3–7 mm.
- 59a. Leaflet blades ovate-lanceolate, 3–6 cm; legume spreading, 2.5–4.5 cm; seeds discoid, stacked like a pile of coins 32. *I. zollingeriana*
- 59b. Leaflet blades oblanceolate-oblong, 2–4 cm; legume ascending to erect; seeds rectangular to quadrate, arranged typically as in genus.
- 60a. Legume 6–9 cm; racemes 5–12 cm; stamens 5–7 mm 34. *I. galegoides*
- 60b. Legume 2–3.5 cm; racemes to 26 cm; stamens 3–4 mm 35. *I. densifruca*
- 54b. Corolla standard outside with white 2-branched trichomes (unknown for *I. jindongensis*).
- 61a. Pedicel (2–)4–9 mm; leaf rachis adaxially flattened, slightly winged.
- 62a. Calyx 2–3 mm, teeth ± equaling tube 48. *I. henryi*
- 62b. Calyx 4–5 mm, teeth to 2 × as long as tube 49. *I. myosurus*
- 61b. Pedicel 0.5–3(–4) mm; leaf rachis not flattened or winged.
- 63a. Racemes usually (9–)10–25(–35) cm.
- 64a. Racemes usually erect or ascending.
- 65a. Corolla standard incurved at apex; peduncle to 0.5 cm; stamens 5–6 mm; corolla pink 56. *I. amblyantha*
- 65b. Corolla standard not incurved at apex; peduncle 0.8–5 cm; stamens 7.5–8.5 mm; corolla dark crimson-red 75. *I. szechuensis*
- 64b. Racemes usually pendulous or spreading.
- 66a. Racemes pendulous, to 30 cm; corolla standard bluish pink, densely downy white puberulent dorsally; leaves (11 or)13–23(–27)-foliolate, leaflet blades adaxially glabrous 61. *I. pendula*
- 66b. Racemes spreading ± horizontally with tips ascending; corolla standard bright reddish pink, thinly strigillose-puberulent; leaves (7 or)9–17(–23)-foliolate, leaflet blades adaxially hairy 62. *I. howellii*
- 63b. Racemes usually shorter, (1–)2–10(–15) cm.
- 67a. Shrublets, 10–30 cm tall; leaflet blade venation obviously reticulate on both surfaces; stamens 4–5 mm, much shorter than 7–9 mm tapering corolla keel 50. *I. reticulata*
- 67b. Shrubs, mostly taller than 30 cm; leaflet blade venation obscure on both surfaces; stamens only ca. 1 mm shorter than corolla keel.
- 68a. Leaves 21–31-foliolate; stamens 3–4 mm 63. *I. sensitiva*
- 68b. Leaves usually 21-foliolate or less (if more than 21-foliolate in *I. franchetii*, *I. hancockii*, *I. heterantha*, and *I. wightii*, then stamens 5–11.5 mm); stamens usually longer than 4 mm (3–4 in *I. byobiensis*, *I. ramulosissima*, and *I. silvestrii* and unknown in *I. jindongensis*).

- 69a. Leaves (9–)13–25(–29)-foliolate.
- 70a. Stamens 5–5.5 mm.
- 71a. Leaflet blades with appressed 2-branched trichomes on both surfaces, midvein abaxially prominent and terminating in a tubular gland; legume erect 59. *I. wightii*
- 71b. Leaflet blades with sparse trichomes abaxially and glabrescent adaxially, midvein not as above; legume spreading 65. *I. mengtzeana*
- 70b. Stamens 6–11.5 mm.
- 72a. Petiole 1–9 mm; stamens (6–)7–11.5 mm; young racemes in bud grayish green; racemes ascending to erect (71. *I. chenii* will also key out here; see note under description of this species) 70. *I. heterantha*
- 72b. Petiole 8–20 mm; stamens 6–7 mm; young racemes in bud dark brown or densely appressed white hairy; racemes stiffly erect.
- 73a. Leaves (5–)9–19-foliolate; young branches, leaves, and racemes with appressed brown 2-branched trichomes 68. *I. hancockii*
- 73b. Leaves (11–)17–27-foliolate; young branches, leaves, and racemes with dense appressed grayish white 2-branched trichomes 69. *I. franchetii*
- 69b. Leaves usually 5–13-foliolate (occasionally to 17-foliolate in *I. mairei*).
- 74a. Legume 3.5–6 cm (unknown in *I. acutipetala* and *I. wilsonii*).
- 75a. Petiole 1.2–5 cm; leaflet blades 1–4(–5) cm.
- 76a. Stems terete; leaves to 18 cm; petiole (1.5–)2–5 cm; racemes 11–15 cm 56. *I. amblyantha*
- 76b. Stems 4-ribbed; leaves 8.5–10.5 cm; petiole 1.2–1.7 cm; racemes 4–7 cm (but only known in fruit) 78. *I. jindongensis*
- 75b. Petiole 0.2–1.1(–1.3) cm; leaflet blades 0.3–1.6 cm.
- 77a. Stipules 5–6(–7) mm; pedicel 2.5–4 mm; corolla standard 11–14 mm 74. *I. wilsonii*
- 77b. Stipules 2–4 mm; pedicel 1–2 mm; corolla standard 7–9.5 mm.
- 78a. Leaves 4–10 cm; racemes 10–19 cm; stamens 7.5–8.5 mm 75. *I. szechuensis*
- 78b. Leaves ca. 3 cm; racemes 5–9 cm; stamens 5–6.5 mm 77. *I. acutipetala*
- 74b. Legume 1.5–3 cm (to 3.5 cm in *I. mairei*, unknown in *I. acutipetala* and *I. wilsonii*).
- 79a. Stamens 6.5–13 mm (sometimes ca. 6 mm in *I. mairei*, 5–6.5 mm in *I. acutipetala*).
- 80a. Corolla standard outside spreading soft pubescent.
- 81a. Shrubs 1–2(–3) m tall; peduncle 0.1–1 cm; corolla standard 0.7–0.9(–1) cm; stamens 6–8 mm 72. *I. mairei*
- 81b. Shrubs 0.3–0.8 m tall; peduncle 1.5–4 cm; corolla standard 1.1–1.4 cm; stamens 10–13 mm 74. *I. wilsonii*
- 80b. Corolla standard outside with dense appressed straight and stiffly medifixed 2-branched trichomes.
- 82a. Corolla standard with a distinct ca. 1 mm mucro at apex; stamens 5–6.5 mm 77. *I. acutipetala*
- 82b. Corolla standard without a mucro; stamens 7–12 mm.
- 83a. Stamens 11–12 mm; pedicel 2–4 mm 76. *I. pseudoheterantha*
- 83b. Stamens 7–9 mm; pedicel 1–2 mm.
- 84a. Corolla standard pink to rose; peduncle 0.1–0.5(–1) cm; stipules ca. 1 mm; leaves 1.5–2.5 cm; racemes 3–6(–8) cm 73. *I. rigioclada*
- 84b. Corolla standard dark crimson-red; peduncle 0.8–5 cm; stipules 2–4 mm; leaves 4–10 cm; racemes 10–19 cm 75. *I. szechuensis*
- 79b. Stamens 3–6.5 mm.
- 85a. Stamens 3–4 mm.
- 86a. Stems prostrate; legume 4-angled, spreading (from Taiwan only) 28. *I. byobiensis*
- 86b. Stems erect; legume cylindrical.
- 87a. Racemes not spinescent (from Taiwan only) 29. *I. ramulosissima*
- 87b. Racemes spinescent 58. *I. silvestrii*
- 85b. Stamens 5–6.5 mm (4–5 mm in *I. bungeana*).
- 88a. Leaflet blades 0.5–4(–5) × 0.3–2 cm; racemes 4–15 cm.
- 89a. Corolla standard apically hooded; leaves to 18 cm; terminal leaflet blade narrowly ovate to elliptic, 2–5 cm; petiole (1.5–)2–5 cm; stamens 5–6 mm 56. *I. amblyantha*
- 89b. Corolla standard not apically hooded; leaves 2.5–5 cm; terminal leaflet blade obovate to elliptic, 0.5–1.5(–2.5) cm; petiole 0.4–1.6(–2) cm; stamens 4–5 mm 57. *I. bungeana*

88b. Leaflet blades $0.3\text{--}0.7 \times 0.2\text{--}0.5$ cm; racemes 1–5 cm.

90a. Leaflet blade indumentum very densely silvery white strigose with appressed 2-branched trichomes, obscuring surfaces 66. *I. calcicola*

90b. Leaflet blade indumentum less dense, abaxially not obscuring surfaces 67. *I. lenticellata*

1. *Indigofera nummulariifolia* (Linnaeus) Livera ex Alston, Handb. Fl. Ceylon 6(Suppl.): 72. 1931.

刺莢木藍 ci jia mu lan

Hedysarum nummulariifolium Linnaeus, Sp. Pl. 2: 746. 1753 [*“nummularifolium”*]; *Acanthonotus echinata* (Willdenow) Benth; *Alysicarpus nummulariifolius* (Linnaeus) Candolle; *H. cuneifolium* Roth; *H. erinaceum* Poiret; *H. rotundifolium* Vahl; *Indigofera echinata* Willdenow; *Onobrychis cuneifolia* (Roth) Candolle; *O. rotundifolia* (Vahl) Desvaux.

Herbs, perennial, prostrate. Stems with appressed medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, $2\text{--}2.5 \times \text{ca. } 0.7$ mm. Leaves simple; petiole 2–3 mm, pulvinate; leaf blade obovate-elliptic to obovate, $1\text{--}2 \times 0.7\text{--}1$ cm, both surfaces and vertically along margin with sparse appressed medifixed trichomes, abaxially with many small dotlike glands, secondary veins 3–5 on each side of midvein, base cuneate to broadly cuneate, apex obtuse to rounded and with a ca. 0.3 mm mucro. Racemes 1.5–2 cm; peduncle 1–1.8 cm; bracts narrowly triangular, $1.5\text{--}2$ mm, not longer than buds. Pedicel 0.5–1 mm. Calyx tube ca. 1 mm; teeth narrowly triangular, $1.5\text{--}2$ mm. Corolla standard broadly ovate, ca. 3×1.5 mm, outside hairy; wings very narrow, ca. 2.5×0.8 mm, glabrous; keel ca. 3.5×1 mm, glabrous, lateral spur small, broad, and obtuse. Stamens 2–2.5 mm; anthers ca. 0.1×0.1 mm. Ovary 2–2.5 mm, hairy, with 1 or 2 ovules. Legume falcate, ca. 7×4 mm, adaxial margin echinate near suture; endocarp not blotched. Seeds 1 per legume, reddish brown, ovoid, flattened, ca. 0.3×1.8 mm. Fl. Oct, fr. Oct–Nov. $2n = 16$.

Sunny sandy areas near seashores, open grasslands; near sea level to 200 m. Hainan, Taiwan [Cambodia, India, Indonesia, Myanmar, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, S Vietnam; Africa, N Australia, Madagascar].

2. *Indigofera squalida* Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 66: 355. 1897.

远志木藍 yuan zhi mu lan

Corchorus oenotheroides H. Léveillé [*“oenotheroides”*]; *Indigofera changensis* Craib; *I. oenotheroides* (H. Léveillé) Lauener; *I. polygaloides* Gagnepain.

Herbs, perennial, erect, to 60 cm tall. Roots tuberous. Stems striate, with appressed white medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, ca. 2 mm. Leaves simple; petiole 3–4 mm; leaf blade narrowly elliptic to obovate, $2.5\text{--}5.5(-7) \times 0.7\text{--}2.5$ cm, both surfaces with appressed medifixed trichomes, abaxially with sparse deciduous disk-shaped glands, secondary veins 10 or 11 on each side of midvein, base cuneate, apex acute and with a ca. 0.5 mm mucro. Racemes 1–2(–3) cm, very densely flowered; bracts narrowly triangular, $2\text{--}2.5 \times \text{ca. } 0.5$ mm. Peduncles, pedicels, bracts, and calyces all with very dense appressed medifixed tri-

chomes. Pedicel 1–1.5 mm. Calyx tube ca. 1 mm; teeth narrowly triangular, $1\text{--}1.5 \times \text{ca. } 0.5$ mm. Corolla red; standard elliptic, $4\text{--}5 \times 2.5\text{--}3$ mm, outside with very dense appressed medifixed trichomes; wings $3.5\text{--}4 \times \text{ca. } 1$ mm, glabrous; keel $4\text{--}4.5 \times \text{ca. } 2$ mm, outside surface with very dense appressed trichomes. Stamens 3–4 mm; anthers glabrous. Ovary hairy, with 5 or 6 ovules. Legume cylindric, descending, straight, $1.1\text{--}1.4$ cm \times $1.5\text{--}2$ mm, with dense appressed medifixed trichomes; style usually persistent and then glands still visible; endocarp not blotched. Seeds 3–5 per legume, yellowish brown, ovoid, ca. 1.2×1 mm. Fl. Jun–Sep, fr. Sep–Nov.

Trailsides, open grasslands, foot of hills; 100–1000 m. Guangdong, Guangxi, Guizhou, Yunnan [Cambodia, Laos, Myanmar, Thailand, Vietnam].

3. *Indigofera pedicellata* Wight & Arnott, Prodr. Fl. Ind. Orient. 200. 1834.

长梗木藍 chang geng mu lan

Indigofera liukiensis Makino.

Herbs, trailing, to 35 cm tall. Stems many branched, gray pubescent and glandular, glabrescent. Stipules narrowly triangular. Leaves 1.4–1.7 cm, 3-foliolate; petiole 5–6 mm; leaflet blades obovate to obovate-lanceolate, $3.7\text{--}10 \times 3\text{--}6$ mm, abaxially with yellowish dots, adaxially glabrous, base cuneate to narrowly cuneate, apex emarginate or obtuse. Racemes 1.3–2.5 cm but elongating in fruit to 3.5 cm, 8–12-flowered; peduncle 5–9 mm; bracts to 1 mm. Pedicel 3–5 mm. Corolla red, 6–7 mm; standard obovate, ca. 5 mm, outside appressed pubescent and glandular; wings ca. 4.5 mm, glabrous; keel spatulate, ca. 5 mm, outside pubescent and glandular. Stamens 4.5–5 mm. Ovary glabrous. Legume straight, 4-sided in cross section, $1.5\text{--}2.5$ cm \times $2\text{--}2.5$ mm, narrowly winged. Seeds 5–8 per legume. Fl. May–Nov, fr. Jul–Dec. $2n = 16$.

Open seashores; below 100 m. Taiwan (Hengchun Peninsula) [India].

This record is based on Sanjappa (Taiwania 29: 111–112. 1984), who drew attention to the unusual disjunct distribution. The material was originally misidentified as *Indigofera trifoliata* (T. C. Huang & H. Ohashi, Fl. Taiwan 3: 309. 1977).

4. *Indigofera trifoliata* Linnaeus, Cent. Pl. II. 29. 1756.

三叶木藍 san ye mu lan

Shrublets or perennial herbs, erect or ascending, 15–60 cm tall. Stems with appressed white medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, $3\text{--}5 \times \text{ca. } 0.2$ mm. Leaves 3-foliolate; petiole 6–10 mm, with dense appressed medifixed trichomes; stipels linear, ca. 0.5 mm, glabrous; petioles 1–2 mm, with very dense appressed medifixed trichomes; leaflet blades opposite, narrowly obovate to obovate-elliptic, $0.6\text{--}3 \times 0.3\text{--}0.5(-1.2)$ cm, both surfaces with sparse appressed medifixed trichomes, abaxially with dark red disk-shaped

glands, secondary veins not visible, base narrowly cuneate, apex rounded to emarginate and with a ca. 0.2 mm mucro. Racemes 5–10 mm, densely flowered; peduncle to 2.5 mm; bracts narrowly triangular, ca. 1×0.2 mm, with dense appressed medifixed trichomes. Pedicel 0.5–1 mm. Calyx 2.5–3 mm, with dense appressed medifixed trichomes; tube 0.5–1 mm; teeth narrowly triangular, 1.2–1.5 mm. Corolla red; standard orbicular, ca. $(2-5) \times 2-3$ mm, outside hairy; wings ca. $(2-4) \times 0.5$ mm, glabrous; keel ca. $(2-5) \times 1$ mm, outside hairy. Stamens $(2-5)-6$ mm; anthers globose, glabrous. Ovary glabrous, with 3–6 ovules. Legume straight, laterally flattened, $10-15 \times$ ca. 2.5 mm, with dense appressed medifixed trichomes and often with disk-shaped glands, sutures thickened; endocarp not blotched. Seeds ca. 2×2 mm. Fl. Jun–Sep, fr. Sep–Oct.

Trailsides, grasslands, near rivers, cultivated fields; below 1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hubei, Hunan, Jiangxi, S Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia, S Japan, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia].

- 1a. Stamens 5–6 mm 4a. var. *trifoliata*
1b. Stamens 2–3 mm 4b. var. *zhengkangensis*

4a. *Indigofera trifoliata* var. *trifoliata*

三叶木蓝(原变种) san ye mu lan (yuan bian zhong)

Indigofera glandulifera Hayata (1911), not Page ex Steudel (1840).

Stamens 5–6 mm. $2n = 16$.

Trailsides, grasslands; below 1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hubei, Hunan, Jiangxi, S Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia, S Japan, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia].

4b. *Indigofera trifoliata* var. *zhengkangensis* H. Sun in C. Y. Wu & S. K. Chen, Fl. Yunnan. 10: 847. 2006.

镇康三叶木蓝 zhen kang san ye mu lan

Stamens 2–3 mm.

• Near rivers, cultivated fields; 1100–1200 m. W Yunnan (Jingdong, Zhenkang).

5. *Indigofera linifolia* (Linnaeus f.) Retzius, Observ. Bot. 4: 29. 1786.

单叶木蓝 dan ye mu lan

Hedysarum linifolium Linnaeus f., Suppl. Pl. 331. 1782; *Sphaerodiophorum linifolium* (Linnaeus f.) Desvaux.

Shrublets or perennial herbs, prostrate or erect, many branched. Stems usually 4-angled, with appressed white medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, $2-3 \times$ ca. 0.2 mm, partly adnate with petiole. Leaves simple or 1-foliolate; petiole 2.5–3 mm, with dense appressed medifixed trichomes; stipels linear, ca. 0.5 mm, glabrous; leaf or leaflet blade usually linear but sometimes elliptic to ovate-elliptic, $0.5-3$ cm \times $2-4$ mm, both surfaces with appressed medifixed trichomes but abaxially more densely so, secondary veins not visible, base narrowly cuneate, apex acuminate and

mucronate. Racemes 1–1.5 cm; peduncle ca. 0.5 mm; bracts ovate, ca. 1×1 mm, with dense appressed medifixed trichomes. Pedicel 0.5–1 mm. Calyx with dense appressed medifixed trichomes; tube ca. 0.5 mm; teeth narrowly triangular, ca. 2 mm. Corolla red; standard elliptic, $4-4.5 \times 2-2.5$ mm, outside hairy; wings $3.5-4 \times$ ca. 1.5 mm, glabrous; keel $3.5-4.5 \times 1-1.5$ mm, glabrous. Stamens 3–4 mm; anthers glabrous. Ovary with minute appressed trichomes, with 1 ovule. Legume ovoid, ca. 2×2 mm, with dense appressed white medifixed 2-branched trichomes; endocarp not blotched. Seed 1 per legume, cubic, ca. 1×1 mm. Fl. Apr–Sep, fr. May–Oct. $2n = 16$.

Grasslands on dry slopes, sunny riversides; below 1200 m. S Sichuan, Taiwan, Yunnan [Afghanistan, Bhutan, Cambodia, India, Indonesia, Kashmir, Laos, Myanmar, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Africa, Australia].

6. *Indigofera cordifolia* B. Heyne ex Roth, Nov. Pl. Sp. 357. 1821.

心叶木蓝 xin ye mu lan

Herbs, procumbent or ascending, 10–30 cm tall. Stems with appressed to slightly spreading white symmetrically to slightly asymmetrically 2-branched trichomes. Stipules lanceolate, ca. 2 mm, with spreading subbasifixed extremely asymmetrically 2-branched trichomes, apex cuspidate. Leaves simple; petiole ca. 1 mm; leaf blade oblong to cordate, $4-8 \times 3-6$ mm, abaxially with dense long spreading subsymmetrically to symmetrically 2-branched trichomes, adaxially with long spreading white subbasifixed trichomes, secondary veins not visible, base cordate, apex acute and with a ca. 0.2 mm mucro. Racemes 2–3 mm, 1–4-flowered; bracts narrowly triangular, ca. 2×0.5 mm, apex cuspidate. Pedicel 0–0.5 mm. Calyx with dense spreading white subbasifixed long trichomes; tube ca. 0.5 mm; teeth linear-triangular, 1.5–2 mm. Corolla standard spatulate to cuneate, $2.5-3 \times 1-1.5$ mm, outside hairy at apex, apex obtuse; wings ca. 2.5×0.2 mm, glabrous; keel ca. 2.5×0.5 mm, glabrous, lateral spur ca. 0.3 mm. Stamens 2–2.5 mm; anthers ca. 0.2×0.3 mm, glabrous. Ovary with spreading white long trichomes, with (1 or)2 ovules. Legume ellipsoid to subglobose, $2.5-3 \times$ ca. 1.6 mm, with densely subspreading white trichomes. Seeds (1 or)2 per legume, reddish brown. Fl. Oct–Nov, fr. Nov–Dec. $2n = 16$.

Sunny slopes; 100–400 m. Guangdong [Afghanistan, India, Indonesia, Pakistan; NE Africa, SW Asia, N Australia].

7. *Indigofera caloneura* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42: 229. 1874.

美脉木蓝 mei mai mu lan

Indigofera oblonga Craib.

Shrubs, erect. Branches angular, with dense appressed brown subbasifixed asymmetrically 2-branched trichomes. Stipules narrowly triangular, 4–5 mm. Leaves simple or 1-foliolate; petioles 1–1.5 cm; stipels linear-subulate, 1.5–2 mm; leaflet blade oblong to elliptic, $8-10 \times 4-5.5$ cm, thickly papery, abaxially with gray and spreading to subspreading gray or brown subbasifixed extremely asymmetrically 2-branched trichomes, adaxially dark green and glabrous, secondary veins 15–17 on each side of midvein and conspicuous, base broadly cuneate to

rounded, apex obtuse to rounded. Racemes 7–13 cm; peduncle short; bracts linear-setaceous, 3.5–4 mm, caducous. Pedicel 3–5 mm in fruit, densely tomentose. Calyx 2–2.5 mm, with densely ascending subbasifixed trichomes; teeth triangular. Corolla pink; standard ovate, 8–10 mm, outside densely appressed brown pubescent, apex obtuse and mucronate; wings 6–8 mm, margin ciliate; keel outside densely appressed brown pubescent. Stamens 8–10 mm; anthers hairy at base. Ovary glabrous or sparsely strigose. Legume cylindrical, 4–5.3 cm, with small appressed trichomes; endocarp red blotched. Seeds 8–11 per legume, dark brown. Fl. unknown for China, fr. Nov–Dec.

Moist places near rivers; ca. 900 m. S Yunnan [India, Laos, Myanmar, Thailand, Vietnam].

This species was described by Kurz as having pink flowers and a densely silky pubescent ovary; however, Sanjappa (Reinwardtia 10: 218–219. 1985) described it as having a glabrous ovary, and de Kort and G. Thijssse (Blumea 30: 112. 1984) described it as having whitish and yellow flowers and a strigose ovary. The Chinese specimens are without flowers. Two specimens from Thailand were recorded as flowering “pinkish” (*Kerr no. 5171*, K!) and “yellow-white” (*K. Larsen et al. no. 1912*, K!), respectively.

8. *Indigofera shipingensis* X. F. Gao, Novon 19: 159. 2009.

石屏木藍 shi ping mu lan

Shrubs. Stems with dense appressed brown medifixed 2-branched trichomes. Stipules subulate, ca. 4 mm. Leaves 1-foliolate; petiole 1–1.5 cm, with usually dense appressed brown medifixed 2-branched trichomes and fewer spreading trichomes; petiolule 2–4 mm, with appressed 2-branched trichomes; stipels 1.5–2.5 mm; leaflet blade oblong to elliptic-ovate, 3–4 × 2–2.5 cm when young, both surfaces with appressed brown medifixed 2-branched trichomes, abaxially canescent, secondary veins 12–15 on each side of midvein. Racemes 3.5–6 cm, densely flowered; peduncle 4–7 mm; bracts subulate, 1–1.5 mm. Pedicel ca. 2 mm. Calyx ca. 2 mm, outside with dense spreading white 2-branched trichomes with unequally long arms; tube ca. 1 mm; teeth ± equaling tube. Corolla standard obovate, ca. 7 mm, outside with dense spreading white and soft 2-branched trichomes; wings narrowly oblong, 1.6–1.8 mm wide, margin ciliate; keel densely spreading hairy at apex, spur ca. 1 mm. Stamens 6–7 mm; anthers glabrous. Ovary with white dense appressed 2-branched trichomes. Fl. Apr, fr. unknown.

• Trailsides. S Yunnan (Shiping).

9. *Indigofera linnaei* Ali, Bot. Not. 111: 549. 1958.

九叶木藍 jiu ye mu lan

Hedysarum prostratum Linnaeus, Mant. Pl. 1: 102. 1767, not *Indigofera prostrata* Willdenow (1802); *I. dominii* Eichler; *I. tsiangiana* F. P. Metcalf.

Shrublets or perennial herbs, usually prostrate, sometimes ascending, 20–90 cm tall. Stems with appressed medifixed sub-symmetrically 2-branched trichomes. Stipules ovate, 3–4 × ca. 2 mm, apex acuminate. Leaves 1.5–3 cm, 5–9-foliolate; petiole and petiolules with appressed medifixed trichomes; stipels not visible; leaflet blades alternate, obovate to narrowly obovate, 5–10(–15) × 2–3(–5) mm, both surfaces with medifixed 2-

branched trichomes, secondary veins not visible, base cuneate, apex obtuse to truncate and with a ca. 0.1 mm mucro. Racemes 0.5–2.5 cm, sessile; bracts ovate to triangular, 2–2.5 × ca. 1 mm. Pedicels, bracts, and calyces with medifixed trichomes. Pedicel ca. 0.5 mm. Calyx 2–2.5 mm, with appressed medifixed trichomes; tube ca. 1 mm; teeth narrowly triangular, 1–1.5 mm. Corolla red; standard red to orangish red, broadly ovate to orbicular, 3–4.5 × 2.5–4 mm, outside hairy; wings 3–4 × 1–1.5 mm, glabrous, margin shortly ciliate; keel 3–4 × ca. 1.5 mm, glabrous, margin shortly ciliate, lateral spur ca. 0.5 mm. Stamens 2.5–4 mm; anthers glabrous. Ovary densely strigose, with (1 or)2 or 3 ovules. Legume oblong, straight, spreading, 3–8 × 1.5–2 mm, densely hairy, apex slightly beaked; endocarp not blotched. Seeds (1 or)2 or 3 per legume, dark brown, cubic, ca. 1 × 1 mm. Fl. Jun–Nov, fr. Nov–Dec. $2n = 16, 32$.

Sandy ground near rivers or seashores, dry open places, sunny trailsides; 100–700(–1200) m. Hainan, S Sichuan, Yunnan [India, Indonesia, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia].

The name *Indigofera enneaphylla* Linnaeus has been incorrectly applied to this species. As now lectotypified, this name is an illegitimate synonym of *Psoralea pinnata* Linnaeus.

10. *Indigofera hendecaphylla* Jacquin, Collectanea 2: 358. 1788.

穗序木藍 sui xu mu lan

Herbs, perennial, prostrate or weakly ascending, 20–100 cm. Branchlets rooting at nodes; young branches dark red, cylindrical, with sparse appressed white medifixed symmetrically 2-branched trichomes, glabrescent. Stipules lanceolate to narrowly triangular, 4–6 × 1.5–2 mm, membranous, glabrescent, apex caudate. Leaves 2.5–7.5 cm, 5–9-foliolate; petiole and rachis with sparse appressed medifixed trichomes, glabrescent; petiole 0.5–2 mm; rachis 1–2.2 cm; stipels spiculate, ca. 0.5 mm; petiolules 1–1.5 mm; leaflet blades alternate, obovate, narrowly obovate, or obovate-oblong, 5–22 × 3–10 mm, abaxially with appressed medifixed trichomes, adaxially glabrous, secondary veins not visible, base cuneate, apex rounded and with a ca. 0.2 mm mucro. Racemes 5–16 cm; peduncle to 1.8 cm; bracts ovate to ovate-lanceolate, 2.5–3 × ca. 1 mm, caducous, apex caudate. Peduncles, bracts, pedicels, and calyces with sparse appressed medifixed trichomes. Pedicel 0.5–1 mm, deflexed in fruit. Calyx tube 0.5–1 mm; teeth narrowly triangular, 2–2.5 mm. Corolla red; standard broadly ovate, 4–5.5 × 3–4 mm, outside with appressed medifixed trichomes, glabrescent when flowering; wings 3–4.5 × 1.5–2 mm, glabrous, margin ciliate along upper auricle; keel 4–5.5 × 2–2.5 mm, outside with medifixed trichomes in bud, glabrescent when flowering, margin ciliate, lateral spur ca. 1 mm. Stamens 4–5 mm; anthers ovoid, glabrous. Ovary with minute appressed trichomes, with 8 or 9 ovules. Legume linear, 4-sided in cross section, 1–2.5 cm × 2–2.5 mm, with appressed medifixed trichomes, apex with ca. 2 mm beak; endocarp not blotched. Seeds 7–9 per legume, dark brown, globose, 1.5–2 × 1–1.2 mm. Fl. Sep–Nov, fr. Nov–Jan.

Open ground, moist sunny trailsides; 800–1100 m. Guangdong, Guangxi (cultivated), Taiwan, Yunnan [Cambodia, India, Indonesia,

Japan (Ryukyu Islands), Laos, Philippines, Sri Lanka, Thailand, Vietnam].

Indigofera hendecaphylla has been misidentified as the African and SW Asian species *I. spicata* Forskål by Y. Y. Fang and C. Z. Zheng (FRPS 40: 316. 1994), T. C. Huang and H. Ohashi (Fl. Taiwan, ed. 2, 3: 305. 1993), C. Z. Zheng (C. T. Cheng) and Y. Y. Fang (Higher Pl. China 7: 145. 2001), and X. Y. Zhu et al. (Legumes China, 439. 2007). See Du Puy et al. (Kew Bull. 48: 727–733. 1993).

11. *Indigofera litoralis* Chun & T. C. Chen, Acta Phytotax. Sin. 7: 26. 1958.

滨海木蓝 bin hai mu lan

Herbs, perennial, prostrate. Roots very long. Stems angled when young, with appressed gray medifixed symmetrically 2-branched trichomes. Stipules lanceolate, 3–4 mm. Leaves 1.5–3 cm, 3–7-foliolate; petiole 1.5–3 mm, adaxially grooved, with appressed white medifixed trichomes; stipels absent; leaflet blades alternate, linear to sometimes narrowly oblong, 7–20 × 1.5–3 mm, both surfaces with appressed medifixed trichomes, secondary veins not visible, base cuneate, apex acuminate to acute and with a ca. 0.2 mm mucro. Racemes 2–3 cm, densely flowered; peduncle 5–8 mm; bracts ovate, ca. 1 mm, caducous. Peduncles, pedicels, bracts, and calyces with appressed medifixed trichomes. Pedicel 0.5–1 mm, reflexed in fruit. Calyx ca. 2.5 mm; tube ca. 0.5 mm; teeth linear, equal, ca. 3–4 × as long as tube, apex acuminate. Corolla red; standard obovate, ca. 5 × 3 mm, outside hairy, base narrowly cuneate, apex obtuse; wings obovate-oblong, glabrous; keel falcate, glabrous. Stamens ca. 4 mm; anthers globose, apex with a ca. 0.2 mm mucro. Ovary linear, densely hairy, with 8–11 ovules. Legume straight, 1.5–2.5 cm × 1.5–2 mm, with small appressed medifixed trichomes, sutures thickened; endocarp not blotched. Seeds 7–10 per legume, dark brown, ellipsoid, ca. 1.2 × 0.8 mm, both ends truncate. Fl. Aug–Sep, fr. Oct.

• Sandy ground near seashores, dry open places, sunny trailsides; below 500 m. Hainan.

12. *Indigofera taiwaniana* T. C. Huang & M. J. Wu, Taiwania 37: 79. 1992.

台湾木蓝 tai wan mu lan

Herbs, annual or perennial, decumbent, to 30 cm tall. Stems with appressed medifixed symmetrically 2-branched trichomes. Leaves 4–6-foliolate; leaflet blades alternate, oblanceolate, oblong, or obovate, 8–18 × 2.5–5 mm, membranous, adaxially with appressed medifixed trichomes along upper margin, secondary veins obscure, base cuneate to narrowly cuneate, apex obtuse and mucronate. Racemes 1.8–4.5 cm, densely flowered; peduncle 9–10 mm; bracts narrowly triangular, ca. 1.8 × 0.7 mm. Calyx teeth narrowly triangular, 2–2.5 × 0.5–0.6 mm. Corolla ± blood-red; standard broadly elliptic, 4.5–5 × 4–4.5 mm, outside hairy; wings 5–5.5 × 1.5–1.7 mm, margin ciliate at base; keel 5–6 × 1–1.2 mm, margin ciliate, spur 0.5–0.6 mm. Stamens 3–3.5 mm; anthers ellipsoid. Ovary hairy, with 9 or 10 ovules. Legume straight, 4-sided in cross section, 2.1–2.3 cm × 1.8–2 mm, apex with a 1–1.5 mm beak; endocarp yellowish brown blotched. Seeds 7–10 per legume, yellow, hexagonal, 1.2–1.5 × ca. 1 mm. Fl. Jun–Sep, fr. Aug–Nov.

• Dry and open meadows on rocks; below 100 m. Taiwan.

13. *Indigofera colutea* (N. L. Burman) Merrill, Philipp. J. Sci. 19: 355. 1921.

疏花木蓝 shu hua mu lan

Galega colutea N. L. Burman, Fl. Indica, 172. 1768; *Indigofera chuniana* F. P. Metcalf.

Herbs, annual or perennial, procumbent or prostrate. Stems with brown gland-tipped trichomes and appressed white medifixed symmetrically 2-branched trichomes. Stipules linear, 3–4 mm, with appressed medifixed trichomes. Leaves 1.5–4 cm, (5–)9- or 11-foliolate; petiole and rachis with appressed medifixed trichomes and gland-tipped trichomes; petiole 7–10 mm; stipels absent; leaflet blades opposite, elliptic to narrowly elliptic, 4–14(–18) × 1.5–4(–8) mm, both surfaces with appressed white medifixed trichomes and gland-tipped trichomes, secondary veins not visible, base cuneate, apex obtuse and minutely mucronate. Racemes (1–)2–6(–8) cm, laxly flowered; bracts linear, ca. 1 mm. Peduncles and pedicels with appressed medifixed trichomes and gland-tipped trichomes. Pedicel ca. 0.5 mm. Calyx ca. 1.2 mm, with spreading medifixed trichomes and gland-tipped trichomes; tube ca. 0.5 mm; teeth linear, ca. 0.7 mm, apex apiculate. Calyces and staminal tubes persistent. Corolla red; standard obovate, ca. 4 mm, outside hairy; wings linear-oblong; keel narrowly obovate. Stamens 3–4 mm; anthers globose, glabrous, apex mucronate. Ovary linear, densely hairy; style short, glabrous. Legume cylindrical, 1.1–2 cm × 1.5–2 mm, with small spreading medifixed trichomes and gland-tipped trichomes; endocarp red blotched. Seeds 9–12 per legume, dark brown, cubic, ca. 1 × 1 mm. Fl. Jun–Aug, fr. Aug–Dec. $2n = 16$.

Sandy ground or wastelands; below 500 m. Guangdong, Hainan [India, Indonesia, Myanmar, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Australia, Pacific islands (New Zealand)].

Material of this species was misidentified as *Indigofera laotica* Gagnepain by T. Hosokawa (Trans. Nat. Hist. Soc. Formosa 32: 195. 1942).

14. *Indigofera dolichochoete* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 64. 1913.

长齿木蓝 chang chi mu lan

Indigofera mollis Franchet (1889), not Ecklon & Zeyher (1834).

Shrubs, erect. Stems with spreading short and white medifixed 2-branched trichomes and long gland-tipped trichomes. Stipules linear, 6–7 mm. Leaves 10–12 cm, 11- or 13-foliolate; petiole and rachis with gland-tipped trichomes and short white medifixed trichomes; petiole 1.5–2 cm; stipels setaceous, ca. 1 mm; petiolules with spreading white medifixed trichomes; leaflet blades elliptic to oblong, 1.8–3 × 1.1–2.2 cm, both surfaces with spreading white basifixed or subbasifixed trichomes, midvein abaxially prominent and adaxially compressed, base rounded, apex obtuse and with a ca. 1 mm mucro. Racemes 12–16 cm, slender; peduncle and rachis with dense spreading medifixed trichomes and sparse glandular trichomes; bracts linear,

3–4 mm, caducous, abaxially with spreading subbasifixed trichomes and sparsely glandular trichomes. Pedicel ca. 2 mm, with spreading medifixed trichomes. Calyx 3–4.5 mm, outside with spreading white medifixed trichomes; tube 0.5–1 mm; teeth linear, 3–4 mm, margin sparsely glandular. Corolla purple; standard elliptic, 6–7 mm, outside with dense appressed white and soft medifixed trichomes, apical mucro ca. 0.2 mm; wings and keel outside with appressed trichomes. Stamens 5.5–6.5 mm; anthers glabrous. Ovary hairy, with 4 or 5 ovules. Legume linear, cylindric, ca. 3 cm, hairy. Fl. Jul–Aug, fr. Aug–Sep.

- Slopes; 1300–2000 m. S Sichuan, Yunnan.

15. *Indigofera scabrida* Dunn, J. Linn. Soc., Bot. 35: 487. 1903.

腺毛木蓝 xian mao mu lan

Indigofera scabrida f. *alba* H. F. Comber; *I. smithiana* E. Peter.

Shrubs, erect, 50–80 cm tall. Stems terete, with dense rusty brown gland-tipped trichomes and spreading minute basifixed extremely asymmetrically 2-branched trichomes. Stipules narrowly lanceolate to narrowly triangular, with long rusty brown gland-tipped trichomes. Leaves 9–13 cm, 7–13-foliolate; petiole and rachis with rusty brown gland-tipped trichomes and minutely basifixed trichomes; petiole 1.5–1.8 cm; stipels subulate, 1–2 mm; petiolules 1.5–2.5 mm; leaflet blades opposite, elliptic to elliptic-oblong, 1.5–3 × 0.7–2 cm, abaxially with sparse appressed basifixed trichomes or medifixed trichomes, adaxially glabrescent or with ± spreading basifixed trichomes or appressed medifixed trichomes, midvein and margin with sparse rusty brown gland-tipped trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 6–8 on each side of midvein, base rounded, apex obtuse and with a ca. 0.5 mm mucro. Racemes 16–18 cm, many flowered; peduncle 1–2 cm; bracts linear-triangular, 2–3 mm, caducous, margin with rusty brown gland-tipped trichomes. Peduncles and pedicels with rusty brown gland-tipped trichomes and spreading minutely basifixed to medifixed trichomes as on branches. Pedicel ca. 1 mm but to 2–3 mm and spreading in fruit. Calyx 2–2.5(–3) mm, with appressed white basifixed or medifixed trichomes and rusty brown gland-tipped trichomes; tube 0.5–1 mm; teeth linear, 1–2 mm, apex acuminate. Corolla crimson; standard ovate to obovate, ca. 7 × 4 mm, outside puberulent, apex obtuse and with a short mucro; wings ca. 6 mm, margin ciliate; keel ca. 7 mm, outside puberulent, margin ciliate. Stamens (5.5–)6–7 mm; anthers ovoid-ellipsoid, glabrous. Ovary linear, ca. 5 mm, glabrescent or sparsely hairy along sutures; style ca. 2 mm. Legume subcylindric, straight, 2.8–4 cm × 2.5–4 mm, with very sparse minute appressed trichomes, sutures thin. Seeds 8–12 per legume, glossy dark brown, smooth, ca. 2 × 1 mm, both ends truncate. Fl. Jun–Sep, fr. Aug–Oct.

Sparse forests, *Pinus* forests, thickets; 1400–2100 m. Guizhou, Sichuan, Yunnan [Laos, Myanmar].

We have not seen the type of *Indigofera smithiana* (H. Smith 1695).

16. *Indigofera kirilowii* Maximowicz ex Palibin, Trudy Glavn. Bot. Sada 17: 62. 1898.

花木蓝 hua mu lan

Indigofera kirilowii var. *alba* Q. Z. Han; *I. macrostachya* Bunge (1858), not Ventenat (1804).

Shrubs, 30–10 cm tall. Stems terete; young branches angular, with sparse appressed medifixed 2-branched trichomes, glabrescent. Stipules lanceolate, 4–6 mm, caducous. Leaves 6–15 cm, (5 or)7–11-foliolate; petiole and rachis flat, adaxially slightly grooved, glabrous or with appressed medifixed trichomes; petiole 0.1–2.5(–3) cm; stipels subulate, 2–3 mm, persistent; petiolules ca. 2.5 mm, densely hairy; leaflet blades opposite, broadly ovate, ovate-rhombic, or elliptic, 1.5–4(–5) × 1–2.3(–3) cm, papery, both surfaces with appressed medifixed trichomes, abaxially pale green, adaxially darker, midvein abaxially obviously prominent and adaxially slightly prominent, secondary veins obvious, base cuneate to broadly cuneate, apex rounded to acute. Racemes 5–12(–20) cm; rachis striate, with sparse appressed white medifixed trichomes; bracts linear-lanceolate, 2–5 mm. Pedicel 3–5 mm, glabrous. Calyx campanulate, 2.5–4 mm, glabrous; tube ca. 1.5 mm; teeth triangular, shorter than to ± equaling tube, most abaxial one ca. 2 mm, margin ciliate. Corolla pink or rarely white; standard elliptic, 1.2–1.4(–1.8) × ca. 0.8 cm, outside glabrous, margin ciliate, apex obtuse; wing margin ciliate. Stamens 1.2–1.4 cm; anthers broadly ovoid, both ends hairy. Ovary glabrous. Legume brown, cylindric, 3.5–7 cm × ca. 5 mm, glabrous; endocarp blotched. Seeds more than 10 per legume, reddish brown, oblong, ca. 5 × 2.5 mm. Fl. May–Jul, fr. Aug–Oct. $2n = 16$.

Scrub on slopes, woodlands; 100–400 m. Hebei, Henan, Jiangsu, SE Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Japan, Korea].

17. *Indigofera fortunei* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 53. 1913.

华东木蓝 hua dong mu lan

Indigofera alba A. Gouault; *I. subnuda* Craib.

Shrubs, to 1 m tall. Stems grayish brown or gray; young branches striate, glabrous. Stipules narrowly lanceolate, 3.5–4(–8) mm, caducous. Leaves 10–15(–20) cm, 7–15-foliolate; petiole and rachis adaxially grooved, glabrous; petiole 1.5–4(–5) cm; stipels subulate, ca. 1 mm; petiolules ca. 1 mm, glabrous; leaflet blades opposite or rarely alternate, ovate, broadly ovate, ovate-elliptic, or ovate-lanceolate, 1.5–4(–5.5) × 0.8–2.8 cm, abaxially with sparse appressed medifixed trichomes on midvein and at margin when young but glabrescent, adaxially glabrous, midvein abaxially prominent and adaxially impressed, secondary veins obvious, base rounded to broadly cuneate, apex obtuse to acute and emarginate with a ca. 2 mm mucro. Racemes 8–18 cm; peduncle ca. 3 cm, glabrous; bracts ovate, ca. 1 mm, caducous. Pedicel ca. 3 mm, glabrous. Calyx 2.5–3.5 mm, with appressed medifixed trichomes; teeth triangular, ca. 0.5 mm, shorter than tube. Corolla purple to pink; standard obovate, 8–10 × 6–8.5 mm, outside with dense appressed trichomes, apex emarginate; wings 8–10 × ca. 2.5 mm, margin ciliate, claws ca. 1 mm; keel 9–10 × 4–4.5 mm, outside apically hairy, margin ciliate, spur very short. Stamens 7–9 mm; anthers ovoid, both ends hairy. Ovary glabrous, with more than

10 ovules. Legume brown, cylindric, 3–4(–5) cm, glabrous; endocarp blotched. Fl. Apr–May, fr. May–Sep.

• Scrub, woodlands; 200–800 m. Anhui, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Zhejiang.

18. *Indigofera decora* Lindley, J. Hort. Soc. London 1: 68. 1846.

庭藤 ting teng

Shrubs, 0.4–2 m tall. Stems terete, striate, glabrous. Stipules caducous. Leaves 8–25 cm, 5–15(–23)-foliolate; petiole and rachis glabrous or with sparse appressed medifixed trichomes; petiole 1–2.5 cm; rachis adaxially grooved; stipules subulate, ca. 1.5 mm; petiolules ca. 2 mm; leaflet blades opposite or rarely alternate or only alternate on basal part of leaf, usually ovate-lanceolate, ovate-oblong, or lanceolate, 2–7.5(–10) × 1–3.5 cm, papery, abaxially with appressed white medifixed trichomes, adaxially glabrous or hairy, base cuneate to broadly cuneate, apex acuminate, acute, or rarely obtuse and mucronate. Racemes 13–21 cm; peduncle 2–4 cm; rachis striate, glabrous; bracts linear-lanceolate, ca. 3 mm, caducous. Pedicel 3–6 mm, glabrous. Calyx cup-shaped, 2.5–3.5 mm, with appressed short trichomes or glabrous; tube 1.5–2 mm; teeth triangular, ca. 1 mm, most abaxial one as long as tube. Corolla light purple, pink, or rarely white; standard elliptic, 1.2–1.8 × ca. 0.7 cm, outside white strigillose-pubescent, sometimes with brown hairs; wings 1.2–1.4 cm, margin ciliate; keel as long as wings, spur ca. 1 mm. Stamens (1.1–)1.3–1.4 cm; anthers ovoid, both ends hairy. Ovary glabrous, with more than 10 ovules. Legume brown, cylindric, 2.5–6.5(–8) cm, glabrous; endocarp blotched. Seeds 7 or 8 per legume, ellipsoid, 4–4.5 mm. Fl. Apr–Jun, fr. Jun–Oct.

Near streams, valleys, woodlands, scrub, trailsides; 200–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang [Japan].

- 1a. Leaves 13–23-foliolate.
 2a. Leaflet blades adaxially glabrous 18a. var. *decora*
 2b. Leaflet blades with sparse appressed medifixed 2-branched trichomes on both surfaces 18c. var. *cooperi*
 1b. Leaves 5–13-foliolate.
 3a. Leaves 5–9-foliolate 18b. var. *chalara*
 3b. Leaves 9–13-foliolate 18d. var. *ichangensis*

18a. *Indigofera decora* var. *decora*

庭藤(原变种) ting teng (yuan bian zhong)

Indigofera ichangensis Craib f. *leptantha* Craib; *I. ichangensis* f. *rigida* Craib.

Leaves 13–19-foliolate; leaflet blades adaxially glabrous.

Near streams, valleys, woodlands, scrub; 200–1800 m. Anhui, Fujian, Guangdong, Jiangsu, Zhejiang [Japan].

18b. *Indigofera decora* var. *chalara* (Craib) Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 27: 164. 1989.

兴山木蓝 xing shan mu lan

Indigofera chalara Craib, Notes Roy. Bot. Gard. Edinburgh 8: 49. 1913.

Leaves 5–9-foliolate; leaflet blades alternate or opposite, both surfaces with sparse appressed medifixed trichomes. Pedicel 4–5 mm but to 1 cm in fruit.

• Scrub. W Hubei (Xingshan).

18c. *Indigofera decora* var. *cooperi* (Craib) Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 27: 164. 1989.

宁波木蓝 ning bo mu lan

Indigofera cooperi Craib, Notes Roy. Bot. Gard. Edinburgh 8: 50. 1913.

Leaves 13–17(–23)-foliolate; leaflet blades alternate or opposite, both surfaces with sparse appressed medifixed 2-branched trichomes.

• Near streams, scrub, trailsides; 400–1500 m. Fujian, Jiangxi, Zhejiang.

18d. *Indigofera decora* var. *ichangensis* (Craib) Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 27: 164. 1989.

宜昌木蓝 yi chang mu lan

Indigofera ichangensis Craib, Notes Roy. Bot. Gard. Edinburgh 8: 50. 1913; *I. faberi* Craib; *I. ichangensis* f. *calvescens* Craib.

Leaves 9–13-foliolate; leaflet blades with appressed medifixed trichomes on both surfaces.

• Scrub, woodlands; 400–800(–1100) m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Zhejiang.

19. *Indigofera venulosa* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 44. 1852.

脉叶木蓝 mai ye mu lan

Indigofera glabra S. S. Chien (1932), not Linnaeus (1753); *I. neoglabra* Hu ex F. T. Wang & Tang; *I. venulosa* var. *glauca* Hayata.

Shrubs, 30–60 cm tall. Stems terete, glabrous. Stipules minute, caducous. Leaves 10–15 cm, 5–13-foliolate; petiole and rachis terete or adaxially grooved, glabrous; petiole 1.5–3.5 cm; stipules as long as petiolules; petiolules ca. 2 mm; leaflet blades opposite, ovate, ovate-rhombic, or suborbicular, 1.3–2.5 × 1–2.7 cm, abaxially with sparse appressed white medifixed trichomes, adaxially glabrous, midvein adaxially impressed, secondary veins and tertiary veins abaxially obvious, base cuneate to rounded, apex obtuse to acute. Racemes ca. 10 cm, laxly flowered; peduncle 2–3 cm, glabrous; bracts ovate-lanceolate, 2–2.5 mm. Pedicel ca. 2.5 mm. Calyx 3–3.5 mm, outside with sparse appressed medifixed trichomes; tube ca. 2 mm; teeth triangular, 1–1.5 mm. Corolla light purple; standard oblong to obovate-oblong, 1.2–1.5 cm, base shortly clawed, outside with appressed white and brown medifixed trichomes, apex obtuse or emarginate; wings narrow, as long as standard, margin ciliate; keel slightly shorter than wings, outside apically hairy, margin ciliate. Stamens 1.1–1.4 cm; anthers ovoid-ellipsoid, both ends hairy. Ovary glabrous. Legume straight, 4–

5 cm, glabrous. Seeds 10–12 per legume. Fl. Mar–May, fr. Jul–Aug.

• Valleys, slopes in forests; ca. 500 m. Guangdong, Taiwan, Zhejiang.

20. *Indigofera carlesii* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 48. 1913.

苏木蓝 su mu lan

Indigofera decora Lindley subsp. *carlesii* (Craib) P. S. Hsu & Y. Y. Fang.

Shrubs, to 1.5 m tall. Stems terete but angular when young, with sparse appressed white medifixed symmetrically 2-branched trichomes. Stipules narrowly lanceolate, 7–10 mm, caducous. Leaves 7–20 cm, 5–9(–13)-foliolate; petiole and rachis with appressed white medifixed trichomes, glabrescent; petiole 1.5–3.5 cm; rachis adaxially grooved; stipels subulate, 2–4 mm, with appressed white trichomes; petiolules 2–4 mm; leaflet blades opposite or rarely alternate, elliptic to ovate-elliptic, 2–5 × 1–3 cm, stiffly papery, both surfaces with dense appressed white medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 6–10 on each side of midvein, base obtuse to broadly cuneate, apex obtuse and mucronate. Racemes 10–20 cm; peduncle and rachis with sparse appressed medifixed trichomes; peduncle ca. 1.5 cm; rachis striate; bracts ovate, 2–4 mm, caducous. Pedicel 2–4 mm. Calyx cup-shaped, 4–4.5 mm, with appressed white medifixed trichomes; teeth lanceolate, most abaxial one as long as tube. Corolla pink to rose; standard elliptic, 1.3–1.5(–1.8) × 0.7–0.9 cm, apex rounded; wings and keel ca. 1.3 cm, margin ciliate; keel spur ca. 1.5 mm. Stamens 1.3–1.7 cm; anthers ovoid, both ends hairy. Ovary glabrous. Legume brown, cylindrical, 4–6 cm, glabrous; endocarp blotched. Fl. Apr–Jun, fr. Aug–Oct.

• Slopes along trailsides, scrub in hills; 500–1000 m. Anhui, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shanxi, Zhejiang.

This species is cultivated in Fujian, Guangdong, Guangxi, and Yunnan.

21. *Indigofera bracteata* Graham ex Baker in J. D. Hooker, Fl. Brit. India 2: 100. 1876.

苞叶木蓝 bao ye mu lan

Shrubs or shrublets, erect or prostrate, 20–90 cm tall. Stems and young branches glabrous. Stipules narrowly lanceolate, 3–7 mm, glabrous. Leaves 3–11 cm, 5- or 7-foliate; petiole and rachis glabrous; petiole 1.5–3.5 cm; rachis adaxially grooved; stipels subulate, 2–2.5 mm; petiolules 1–1.5 mm; leaflet blades opposite, elliptic to obovate-elliptic, 1.2–2.5(–3.2) × 0.6–1 cm, membranous, both surfaces with appressed medifixed trichomes, abaxially pale green, adaxially darker, midvein abaxially prominent, secondary veins 5–10 on each side of midvein and obvious, base broadly cuneate to rounded, apex rounded to emarginate and mucronate. Racemes 8–15 cm, densely flowered; peduncle (1–)3–5 cm, glabrous; bracts cuspidate, 4–6 × 2–2.2 mm, covering buds, reticulate veined, margin ciliate, apex acuminate. Pedicel (1.5–)2–3 mm. Calyx 1–1.5(–2) mm, with appressed white or brown trichomes; tube 1–1.5 mm; teeth triangular, ca. 0.5 mm. Corolla light purple or white; stan-

dard broadly ovate, 7–9 × 5.5–6 mm, outside with appressed white or light brown trichomes; wings 6–8 mm, margin ciliate; keel 7–9 mm, spur ca. 1 mm. Stamens 7–8 mm; anthers ovoid, base with a few trichomes. Ovary glabrous, with 8 or 9 ovules. Legume cylindrical, spreading, 3–3.5 cm × 2–3 mm, glabrous. Seeds 7–10 per legume. Fl. May–Jul, fr. unknown for China. $2n = 16$.

Grasslands in mountain forests; 2700–3000 m. S Xizang [?Bhutan, India, Kashmir, Nepal].

22. *Indigofera hebetata* Bentham ex Baker var. **glabra** Ali, Bot. Not. 3: 572. 1958.

光叶毛瓣木蓝 guang ye mao ban mu lan

Indigofera hebetata f. *glabra* (Ali) H. Ohashi.

Shrubs, 1–3 m tall. Stems dark brown, terete; young branches with sparse appressed medifixed symmetrically 2-branched trichomes, glabrescent. Stipules narrowly lanceolate, ca. 3 mm, caducous. Leaves 10–15(–25) cm, 5–13(or 15)-foliolate; petiole and rachis with appressed brown medifixed trichomes; petioles 2–5 cm; rachis adaxially grooved; stipels subulate, ca. 2 mm; petiolules 2–3 mm, densely hairy; leaflet blades opposite, ovate, ovate-elliptic, or oblong, 1.2–6.5(–8) × 0.7–3.5(–4.5) cm, papery, abaxially with white and brown appressed medifixed trichomes, midvein adaxially flat, secondary veins 6–8 on each side of midvein, base rounded to broadly cuneate, apex obtuse to emarginate. Racemes 10–25 cm; peduncle 2–2.5 cm; bracts boat-shaped, ca. 6 × 1–3 mm, covering buds, outside hairy. Pedicel 1–2 mm. Calyx campanulate, ca. 2 mm, with appressed brown trichomes; tube ca. 1.5 mm; teeth triangular, ca. 0.5 mm. Corolla purple; standard 1.2–1.4 × 0.6–0.8 cm, outside hairy; wings 1–1.1 cm, glabrous; keel as long as wings. Stamens 8–10 mm; anthers ovoid, base with a few trichomes. Ovary glabrous. Legume cylindrical, 2.5–5.5 cm, glabrous; endocarp not blotched. Seeds 8–10 per legume, ca. 2 × 1.5 mm. Fl. Jun–Jul, fr. Jul–Oct. $2n = 16$.

Evergreen forests, slopes in scrub; 1700–2900 m. S Xizang [Bhutan, India, Nepal, Pakistan].

Indigofera hebetata var. *hebetata* occurs in India, Pakistan, and Nepal and differs in having leaflet blades pubescent on both surfaces.

23. *Indigofera cassioides* Rottler ex Candolle, Prodr. 2: 225. 1825.

椭圆叶木蓝 tuo yuan ye mu lan

Indigofera arborea Roxburgh; *I. elliptica* Roxburgh; *I. leptostachya* Candolle; *I. pulchella* Roxburgh; *I. violacea* Roxburgh.

Shrubs, 1–1.5 m tall. Stems brown, robust, with obvious lenticels; young branches green or red-brown, angular, with appressed white medifixed symmetrically 2-branched trichomes. Stipules linear, caducous. Leaves 5.5–15 cm, 13–21-foliate; petiole and rachis with sparse appressed medifixed trichomes; petiole 1.1–1.8 cm; rachis adaxially grooved; stipels subulate, ca. 1 mm; petiolules ca. 2 mm, hairy; leaflet blades opposite, subopposite, or rarely alternate, elliptic to obovate, 1–2.4 × 0.7–1.5 cm, both surfaces with appressed white medifixed tri-

chomes, midvein abaxially prominent and adaxially slightly impressed, secondary veins 8–11 on each side of midvein and obvious, base cuneate to rounded, apex obtuse to truncate. Racemes 4–17 cm; peduncle very short, base with persistent bud scales; rachis angular, with appressed brown trichomes; bracts ovate to lanceolate, 2–4 mm, caducous, abaxially with appressed brown to grayish brown trichomes. Pedicel 1–2 mm, hairy. Calyx cup-shaped, 2.5–3.5 mm, outside with sparse appressed white trichomes; teeth triangular, as long as tube. Corolla purple to light purple; standard broadly ovate, ca. 10 × 7–7.5 mm, glabrous, base clawed, apex obtuse; wings 8–9.5 mm, base auriculate and clawed, margin ciliate; keel 9–9.5 mm, outside apically hairy, very shortly spurred, margin ciliate. Stamens 7–9.5 mm; anthers ovoid to ellipsoid, glabrous. Ovary glabrous. Legume cylindric, 2.4–4.5 cm × ca. 4 mm, glabrous; endocarp blotched. Seeds 8–12 per legume, reddish brown, cubic, ca. 2 × 2 mm. Fl. Jan–Mar, fr. Apr–Jun. $2n = 16$.

Slopes, grasslands, sparse woodlands, scrub; 300–2000 m. W Guangxi, Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam].

24. *Indigofera hamiltonii* Graham ex Duthie & Prain, Ann. Roy. Bot. Gard. (Calcutta) 9: 22. 1901.

腾冲木蓝 teng chong mu lan

Indigofera tengyuehensis H. T. Tsai & T. T. Yu.

Shrubs. Stems yellowish gray, with appressed white medifixed 2-branched trichomes. Stipules narrowly lanceolate, ca. 3 mm, caducous. Leaves ca. 13 cm, mostly 3- or 5-foliolate, more rarely to 11 (or 13)-foliolate; petiole and rachis with appressed medifixed trichomes; petiole 1.5–2 cm; rachis flattened and adaxially grooved; stipels subulate, minute; petiolules 1.5–2 mm, with appressed brown trichomes; leaflet blades opposite, elliptic-oblong, 1.2–2.2 × 0.7–1.2 cm, papery, both surfaces with appressed white medifixed trichomes, midvein adaxially impressed, secondary veins 5 or 6 on each side of midvein, base broadly cuneate to subrounded, apex rounded, truncate, or emarginate and mucronate. Racemes 15–20 cm, laxly flowered; peduncle 1.5–2 cm; bracts linear-lanceolate, ca. 2 mm, caducous. Pedicel 1–2 mm, deflexed in fruit, hairy. Calyx campanulate, ca. 3 mm, with appressed medifixed trichomes; tube ca. 1.5 mm; teeth triangular to ovate, most abaxial one as long as tube, margin densely ciliate, apex long acuminate. Corolla purple; standard elliptic-oblong, 10–12 × ca. 6 mm, outside glabrescent, base clawed, apex obtuse; wings and keel clawed at base; wings as long as keel. Stamens 5–8 mm; anthers ovoid, base with a few trichomes. Ovary glabrous, with 6–8 ovules. Legume linear, cylindric, ca. 3.5 cm, glabrescent. Fl. and fr. May.

Forests on slopes; ca. 1000 m. W Yunnan [India].

Sanjappa (Bull. Bot. Surv. India 21: 73. 1995) reported the leaves of this species as 3- or 5(-13)-foliolate.

Although the protologue of *Indigofera tengyuehensis* is not a good match for *I. hamiltonii* as currently understood, examination of isotype material (E!) shows that it obviously belongs here. We have not found the holotype specimen; its leaves were described as 9–15-foliolate in the protologue, but they are only 3–7-foliolate in the examined isotype.

25. *Indigofera atropurpurea* Buchanan-Hamilton ex Home-mann, Hort. Bot. Hafn., Suppl. 152. 1819.

深紫木蓝 shen zi mu lan

Indigofera cavaleriei H. Léveillé.

Shrubs or small trees, 1.5–5 m tall. Stems brown, terete, with round lenticels; young branches green, angular, with appressed white or brown medifixed symmetrically 2-branched trichomes. Stipules lanceolate-subulate, 3–5 mm, caducous. Leaves ca. 2.4 cm, (7–)11–19 (or 21)-foliolate; petiole and rachis with appressed white and brown medifixed trichomes; petioles 2.5–3.5 cm; rachis flattened or adaxially slightly grooved; stipels subulate, as long as petiolules; petiolules 1.5–2.5 mm; leaflet blades opposite, ovate to elliptic, 1.5–6.5(-8) × 1–2.5 cm, membranous, both surfaces with appressed medifixed trichomes or adaxially glabrous, midvein abaxially prominent and adaxially impressed, secondary veins 8–10 on each side of midvein, base broadly cuneate to rounded, apex obtuse, emarginate, or acute and mucronate. Racemes 8–15(-28) cm; peduncle and rachis with sparse appressed medifixed trichomes; peduncle 1.5–2.5 cm; bracts ovate to ovate-lanceolate, 2.5–3.5(-5) mm, abaxially with appressed brown trichomes. Pedicel ca. 1.5 mm. Calyx ca. 2.5 mm, with dense appressed grayish brown medifixed trichomes; teeth triangular, ca. 0.5 mm. Corolla dark purple; standard elliptic, 7–8.5 × 4.5–5.5 mm, glabrous; wings 7–8 mm, margin apically ciliate; keel 7.5–8.5 mm, outside apically hairy, margin ciliate. Stamens 6–7 mm; anthers globose, base with a few trichomes. Ovary glabrous, with 6–9 ovules. Legume cylindric, 2.5–5 cm, with sparse appressed trichomes when young, glabrescent when mature, sutures thickened; endocarp not blotched. Seeds 6–9 per legume, rufous brown, cubic, ca. 1.8 × 1.5 mm. Fl. May–Sep, fr. Aug–Dec. $2n = 16, 32$.

Scrub on mountains, sparse forests, grasslands near trailsides or streams; 300–1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hunan, S Jiangxi, S Sichuan, SE Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Vietnam].

26. *Indigofera parkesii* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 59. 1913.

浙江木蓝 zhe jiang mu lan

Shrublets, erect, 30–60 cm tall. Stems flexuous, terete or angular, with appressed white or brown basifixed crisped trichomes. Stipules linear, ca. 8 mm. Leaves 8–15(-20) cm, 5–25-foliolate; petiole 1–3 cm; rachis terete to slightly flattened, adaxially grooved, with appressed crisped trichomes; stipels subulate, ca. 3.5 mm; petiolules 1.5–2 mm, hairy; leaflet blades opposite, ovate, broadly ovate, or elliptic, 1.3–7 × 1–3.7 cm, stiffly papery, abaxially with spreading crisped basifixed trichomes, adaxially with sparse appressed medifixed trichomes, midvein adaxially flat to slightly impressed, secondary veins 6 on each side of midvein and looped near margin, base cuneate to rounded, apex rounded to acute and mucronate. Racemes 3–25 cm; peduncle 1–7 cm, with spreading crisped trichomes; bracts linear, 3–5.5 mm. Pedicel 2–2.5 mm. Calyx campanulate, 4–4.5 mm, with sparse spreading crisped trichomes; teeth lanceolate, unequal, most abaxial one as long as tube. Corolla pale purple or white; standard obovate-elliptic, 10–13 × 5.5–7.5

mm, outside with dense appressed white trichomes, base broadly cuneate, apex obtuse; wings 1.1–1.2 cm, margin ciliate; keel 1.1–1.4 cm. Stamens 1.2–1.3 cm; anthers ovoid-ellipsoid, both ends hairy. Ovary glabrous. Legume cylindric, 3–5 cm, glabrous; endocarp not blotched. Fl. May–Sep, fr. Sep–Oct.

• Forests, scrub, trailsides on slopes, woodlands on slopes; 100–1000 m. Anhui, Fujian, Jiangxi, Zhejiang.

1a. Leaves 15–25-foliolate 26c. var. *polyphylla*

1b. Leaves 5–11-foliolate.

2a. Racemes 3–13 cm, usually shorter than leaves; peduncle 1–1.5 cm 26a. var. *parkesii*

2b. Racemes 15–25 cm, longer than leaves; peduncle to 7 cm 26b. var. *longipedunculata*

26a. *Indigofera parkesii* var. *parkesii*

浙江木蓝(原变种) zhe jiang mu lan (yuan bian zhong)

Leaves 5–11-foliolate; leaflet blades ovate to elliptic, 1.3–3(–5) × 1–3 cm. Racemes 3–13 cm; peduncle 1–1.5 cm. Corolla pale purple or rarely white.

• Forests, scrub; 100–600 m. Anhui, Fujian, Jiangxi, Zhejiang.

26b. *Indigofera parkesii* var. *longipedunculata* (Y. Y. Fang & C. Z. Zheng) X. F. Gao & Schrire, **comb. et stat. nov.**

长总梗木蓝 chang zong geng mu lan

Basionym: *Indigofera longipedunculata* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 331. 1983 [*“longipedmculata”*].

Leaves 5- or 7-foliolate; leaflet blades ovate to elliptic, 4–7 × 2–3.7 cm. Racemes 15–25 cm; peduncle to 7 cm. Corolla purple or white.

• Trailsides on slopes, forests; 700–1000 m. Jiangxi, Zhejiang.

26c. *Indigofera parkesii* var. *polyphylla* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 336. 1983.

多叶浙江木蓝 duo ye zhe jiang mu lan

Leaves 15–25-foliolate; leaflet blades ovate to lanceolate, 1.3–3(–5) × 1–3 cm. Racemes 5–13 cm; peduncle 1–1.5 cm. Corolla white.

• Trailsides, woodlands on slopes; 400–500 m. Anhui, Jiangxi.

27. *Indigofera suffruticosa* Miller, Gard. Dict., ed. 8, *Indigofera* no. 2. 1768.

野青树 ye qing shu

Shrubs or shrublets, erect, 0.8–1.5 m tall. Stems grayish green, with appressed medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, ca. 4 mm. Leaves 5–10 cm, 11–15(–19)-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole ca. 1.5 cm; leaflet blades oblong to oblanceolate, 1–4 × 0.5–1.5 cm, abaxially pale green and with appressed medifixed trichomes, adaxially green and with dense appressed medifixed trichomes or glabrescent, base broadly cuneate to rounded, apex acute to rarely rounded. Racemes 2–3 cm, densely flowered; peduncle very short or

absent; bracts linear, ca. 2 mm, caducous, abaxially with appressed medifixed trichomes. Pedicel reflexed in fruit. Calyx ca. 1.5 mm, outside hairy; teeth broadly triangular, as long as tube. Corolla red; standard obovate, 4–5 mm, outside with dense brown trichomes; keel as long as wings, hairy. Stamens 3–4 mm; anthers globose, glabrous, apex mucronate. Ovary densely hairy. Legume deflexed and upwardly falcate, 1–1.5 cm, hairy; endocarp blotched. Seeds 6–8, brown, shortly cylindric, both ends truncate. Fl. Mar–May, fr. Jun–Oct. $2n = 16, 32$.

Cultivated or naturalized in Fujian, Guangdong, Guangxi, Jiangsu, Taiwan, Yunnan, and Zhejiang [native to tropical America; widely cultivated in tropical and subtropical Asia].

Indigofera suffruticosa is cultivated as an alternative to *I. tinctoria* for the production of the dye indigo.

28. *Indigofera byobensis* Hosokawa, J. Soc. Trop. Agric. 4: 200. 1932.

屏東木蓝 ping dong mu lan

Shrubs, 30–50 cm tall, with prostrate branches. Stems slender, cylindric, with appressed medifixed symmetrically 2-branched trichomes. Stipules setaceous, 1–2 mm. Leaves 5- or 7-foliolate; petiole ca. 2 cm; leaflet blades opposite, oblong to elliptic, 7–10 mm, both surfaces with appressed medifixed trichomes but especially dense on light green abaxial surface, adaxially green, base obtuse to cuneate, apex obtuse and with a ca. 0.3 mm mucro. Racemes 5–7 cm, much longer than leaves. Pedicel ca. 1 mm. Calyx ca. 3 mm, with appressed medifixed trichomes; tube ca. 1 mm; teeth lanceolate, ca. 2 mm. Corolla red; standard broadly obovate-rhombic, ca. 4.5 × 5 mm; wings obovate-rhomboid, ca. 5 × 2 mm; keel spatulate, ca. 3 × 1.5 mm, margin ciliate. Stamens 3–4 mm. Ovary linear, ca. 3 mm, with 7 ovules; style upwardly curved, ca. 1 mm. Legume straight, 4-sided in cross section, ca. 2.5 cm, with appressed medifixed trichomes. Seeds 5–7 per legume, cubic, ca. 1.5 × 1.5 mm, both ends truncate. Fl. Jul–Nov, fr. Aug–Dec. $2n = 16^*$.

• Dry and open fields; below 100 m. Taiwan.

29. *Indigofera ramulosissima* Hosokawa, J. Soc. Trop. Agric. 4: 199. 1932.

多枝木蓝 duo zhi mu lan

Shrubs, dwarf, many branched. Stems rigid, slightly angular, with appressed white medifixed symmetrically 2-branched trichomes. Stipules spiculate, minute. Leaves 1–3 cm, 7-foliolate; petiole and rachis with appressed white medifixed trichomes; petiole ca. 8 mm; rachis terete; stipels minute, bristle-like; leaflet blades opposite, obovate, 3–8 × 2–3 mm, both surfaces with appressed medifixed trichomes but abaxially denser, secondary veins not visible, base broadly cuneate to rounded, apex obtuse and mucronate. Racemes 1.3–2.5 cm, laxly flowered; peduncle ca. 5 mm; bracts ca. 1 mm. Pedicel 1–1.5 mm, hairy, spreading or reflexed in fruit. Calyx 2–3 mm, with appressed gray trichomes; teeth triangular, as long as tube. Corolla standard broadly obovate, ca. 3.5 × 3 mm, outside hairy; wings oblong, ca. 3.2 mm, margin ciliate; keel obovate, ca. 3.5 mm. Stamens 3–4 mm; anthers ovoid. Ovary linear, glabrous. Legume linear, cylindric, ca. 1.5 cm. Seeds 4–6 per legume, reniform, ca. 2 mm. Fl. Jun–Nov, fr. Aug–Dec.

- Dry rocky slopes; 700–1500 m. Taiwan.

30. *Indigofera tinctoria* Linnaeus, Sp. Pl. 2: 751. 1753.

木蓝 mu lan

Shrublets, erect, 50–100 cm tall. Young branches with appressed white medifixed symmetrically 2-branched trichomes. Stipules narrowly triangular, ca. 2 mm. Leaves 2.5–11 cm, 9–13-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 1.3–2.5 cm; stipels minute; petiolules ca. 2 mm; leaflet blades opposite, obovate-oblong to obovate, 1.5–3 × 0.5–1.5 cm, both surfaces with appressed medifixed trichomes, adaxially sometimes glabrous, midvein adaxially impressed, secondary veins not visible, base broadly cuneate to rounded, apex rounded to emarginate. Racemes 2.5–5(–9) cm, laxly flowered; peduncle absent; bracts bristlelike, 1–1.5 mm. Pedicel 4–5 mm, reflexed in fruit. Calyx ca. 1.5 mm, with appressed medifixed trichomes; teeth triangular, as long as tube. Corolla red; standard broadly obovate, 4–5 mm, outside with brown trichomes; wings ca. 4 mm; keel as long as wings. Stamens 4–5 mm; anthers cordate. Ovary glabrous. Legume linear, deflexed and straight to semicircular but never falcate, 2.5–3 cm, hairy or glabrous; endocarp purplish red blotched. Seeds 5–12 per legume, cubic, ca. 1.5 mm. Fl. year-round, fr. Oct. $2n = 16$.

Cultivated in SW Anhui, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, and Yunnan [widely distributed in tropical Asia and Africa].

Indigofera tinctoria is widely used as the source of the dye indigo.

31. *Indigofera nigrescens* Kurz ex King & Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 67: 286. 1898.

黑叶木蓝 hei ye mu lan

Indigofera atropurpurea Buchanan-Hamilton ex Hornemann var. *nigrescens* E. Pottinger & Prain; *I. mekongensis* Jesson.

Shrubs, erect, 1–2 m tall. Stems reddish brown; young branches green, striate, with appressed brown medifixed symmetrically 2-branched trichomes. Stipules linear, 5–8 mm. Leaves 8–18 cm, 11–23-foliolate; petiole and rachis with sparse appressed medifixed trichomes; petiole 2–2.5 cm; rachis terete or slightly flattened, adaxially grooved; leaflet blades opposite, elliptic to obovate-elliptic, 1.5–2.5 × 0.7–1.3 cm, papery, both surfaces with sparse appressed medifixed trichomes, abaxially usually becoming dark or black or with black spots when dry, base broadly cuneate to rounded, apex obtuse and mucronate. Racemes ca. 19 cm, densely flowered; peduncle ca. 2 cm; bracts linear, 5–7(–9) mm, abaxially with brown medifixed trichomes. Pedicel 1–1.5 mm, with brown medifixed trichomes. Calyx 3–5 mm, with appressed brown and white medifixed trichomes; tube 2.5–3 mm; teeth triangular, most abaxial one ca. 1 mm. Corolla red to purple; standard obovate, 6.5–7 × ca. 4 mm, outside with appressed brown and white medifixed trichomes, inside basally hairy, base clawed, apex obtuse; wings 5.5–6 mm, margin ciliate; keel as long as wings, outside apically hairy, margin ciliate, spur ca. 1 mm. Stamens 4–5 mm; anthers ovoid-globose, base with a few trichomes. Ovary glabrous, with 8 or 9 ovules. Legume cylindrical, 1.7–2.8 cm, with

sparse appressed medifixed trichomes, apex obtuse; endocarp blotched. Seeds 7 or 8 per legume, reddish brown, ovoid, ca. 2.5 mm. Fl. Jun–Sep, fr. Sep–Oct.

Hills, scrub, sparse forests, sunny grasslands, fields, river beaches; 500–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [India, Indonesia, Laos, Myanmar, Philippines, Thailand, S Vietnam].

32. *Indigofera zollingeriana* Miquel, Fl. Ned. Ind. 1: 310. 1855.

尖叶木蓝 jian ye mu lan

Indigofera benthamiana Hance; *I. kotoensis* Hayata; *I. teysmanii* Miquel.

Shrubs or small trees, erect, 1–3 m tall. Stems with slightly appressed medifixed symmetrically 2-branched trichomes. Stipules narrowly lanceolate, 5–8 mm, caducous. Leaves 20–25 cm, 11–19-foliolate; petiole and rachis with appressed white and brown medifixed trichomes; petiole 2–2.5 cm; rachis flattened and adaxially grooved; stipels spiculate, 1.5–2 mm; petiolules 2–3 mm, with appressed trichomes; leaflet blades opposite, ovate-lanceolate, 3–6 × 1.5–2 cm, papery, both surfaces with appressed medifixed trichomes, midvein prominent, secondary veins 13 or 14 on each side of midvein and obvious, base rounded to broadly cuneate, apex acuminate. Racemes 7–13 cm, densely flowered; peduncle with appressed or spreading rust-colored trichomes; bracts lanceolate, ca. 1.5 mm. Pedicel as long as bracts, with appressed brown trichomes. Calyx 1–2 mm, with dense appressed grayish brown trichomes; tube ca. 1 mm; teeth triangular, ca. 0.5 mm. Corolla white or purple; standard ovate-lanceolate, 6.5–8 mm, outside with dense appressed brown trichomes; wings as long as standard, margin ciliate; keel 7–7.5 mm, outside with dense appressed brown trichomes. Stamens 5–6.5 mm; anthers ellipsoid, base with a few trichomes. Ovary glabrous. Legume cylindrical, spreading, 2.5–4.5 cm × 5.5–6 mm, sparsely hairy; endocarp blotched. Seeds 10–16, discoid, ca. 2 mm in diam., arranged like a pile of coins. Fl. Jun–Sep, fr. Oct–Dec. $2n = 16$.

Sunny places, trailsides, forests; 400–600 m. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Indonesia, Japan, Laos, Malaysia, Philippines, Thailand, Vietnam].

33. *Indigofera sootepensis* Craib, Bull. Misc. Inform. Kew 1911: 35. 1911.

福建木蓝 fu jian mu lan

Shrubs, to 2 m tall. Stems with dense appressed brown 2-branched trichomes with equally long arms. Stipules narrowly triangular, 7–10 mm, caducous. Leaves 7–10 cm, 13–19-foliolate; petiole and rachis with appressed brown 2-branched trichomes; petiole 1–2 cm; stipels narrowly triangular, ca. 2 mm; leaflet blades oblong to elliptic, 1.8–2.2 × 0.9–1.1 cm, both surfaces with appressed 2-branched trichomes, base rounded, apex obtuse and mucronate. Racemes 4–8 cm; bracts narrowly triangular, ca. 4 mm, longer than buds. Pedicel ca. 1.5 mm. Calyx with appressed brown trichomes; tube ca. 2 mm; teeth broadly triangular, ca. 0.5 mm. Corolla red; standard narrowly elliptic, 1.4–1.6 × 0.5–0.6 cm, outside with appressed stiff brown 2-branched trichomes, apex acute; wings narrowly ellip-

tic, 1–1.1 cm × ca. 2 mm, margin apically ciliate, apex hairy; keel 1.8–2 cm × ca. 3 mm, margin apically ciliate, apex long acute and hairy. Stamens 1.3–1.6 cm; anthers ellipsoid, glabrous. Ovary glabrous. Legume ca. 4.5 cm × 5 mm, sparsely strigose with appressed trichomes; endocarp blotched. Seeds 8–11 per legume, brown, ellipsoid.

Fujian [Cambodia, Laos, Thailand, Vietnam].

There seems to be some doubt about the identity of the Fujian material. Typical *Indigofera sootepensis* has leaves 15–20 cm, 29–51-foliolate; stipules 7–12 mm, attenuate; and racemes 10–13 cm. The distribution of typical *I. sootepensis* in Indochina is tropical dipterocarp forests to 1000 m.

34. *Indigofera galeoides* Candolle, Prodr. 2: 225. 1825.

假大青藍 jia da qing lan

Indigofera finlaysoniana Graham ex Ridley; *I. mansuensis* Hayata; *I. uncinata* Roxburgh.

Shrubs or shrublets, 1–2 m tall. Young branches angular, with appressed white or grayish brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules linear, 3–4 mm. Leaves ca. 20 cm, 11–25-foliolate; petiole and rachis with appressed white mixed brownish gray medifixed trichomes; petiole 1.5–3 cm; rachis adaxially grooved; stipels subulate, 0.5–1 mm; petiolules ca. 2 mm, with brown trichomes; leaflet blades opposite or subopposite, oblong to oblanceolate-oblong, 2–4 × 0.7–1.6 cm, membranous, both surfaces with appressed brown and white medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 11 on each side of midvein, base broadly cuneate to rounded, apex rounded to acute and mucronate. Racemes 5–12 cm, densely flowered; peduncle and rachis with appressed white medifixed trichomes; peduncle 7–10 mm; bracts subulate, 1–2 mm. Pedicel as long as bracts, with appressed medifixed trichomes. Calyx campanulate, ca. 2 mm, with slightly appressed trichomes; tube 1–1.5 mm; teeth triangular, ca. 0.5 mm. Corolla pink; standard ovate-oblong, 8–9 × ca. 5 mm, outside with dense appressed brown trichomes; wings ca. 8 mm, margin ciliate; keel as long as wings, outside with dense appressed brown trichomes at apex, spur ca. 1.5 mm. Stamens 5–7 mm; anthers ovoid-ellipsoid, glabrous. Ovary glabrous, with 20 ovules. Legume cylindrical, ascending to erect, 6–9 cm, with slightly appressed brown trichomes when young, glabrescent; endocarp blotched. Seeds 15–18 per legume. Fl. Apr–Aug, fr. Sep–Oct.

Open places, valleys; 600–1700 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, S Yunnan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

35. *Indigofera densiflora* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 327. 1983.

密果木藍 mi guo mu lan

Shrubs, to 2 m tall. Stems brown, terete, with pale yellow lenticels; young branches obviously 4-sided, with appressed white and brown medifixed symmetrically 2-branched trichomes. Stipules linear, 3–5 mm. Leaves 9–15 cm, 13–19-foliolate; petiole 1.3–2.5 cm; petiolules 1.5–2 mm; leaflet blades

ovate, oblong-lanceolate, or lanceolate, 1.7–3.5 × 0.9–1.3 cm, both surfaces with appressed white medifixed trichomes and extremely dense on margin and abaxial midvein, base broadly cuneate to rounded, apex obtuse to acute and mucronate. Racemes 9–16(–26) cm, densely flowered; peduncle 1–1.5 cm; bracts linear, 1–1.5 mm. Pedicel ca. 2 mm. Calyx with appressed brown medifixed trichomes; tube ca. 1 mm; teeth triangular, ca. 0.5 mm, rarely margin glandular. Corolla light purple; standard oblong, ca. 6 × 4 mm, outside with dense appressed white and brown trichomes; wings oblanceolate, ca. 5 × 1.3 mm, apical margin ciliate; keel slightly longer than wings, outside apically with appressed white trichomes, spurs ca. 1 mm. Stamens 3–4 mm; anthers ovoid. Ovary glabrous. Legume cylindrical, ascending to erect, 2–3.5 cm, constricted between seeds, with appressed brown trichomes. Seeds 6–10 per legume, rufous brown, globose. Fl. Jun, fr. Jun–Aug.

• Riverbanks, moist slopes; ca. 700 m. N Guangdong, NW Guangxi, Guizhou, Hunan.

36. *Indigofera caudata* Dunn, Gard. Chron., ser. 3, 32: 210. 1902.

尾叶木藍 wei ye mu lan

Shrubs, to 2.5 m tall. Stems brown, terete, with sparse spreading medifixed symmetrically 2-branched trichomes; young branches grayish brown, angular, with dense spreading brown subbasifixed very asymmetrically 2-branched trichomes. Stipules linear, ca. 7 mm, persistent or caducous, with spreading brown crooked basifixed trichomes. Leaves 12–18 cm, 5–11-foliolate; petiole and rachis with dense spreading brown submedifixed trichomes; petiole 2–3 cm; rachis trigonous, adaxially flattened or grooved; stipels subulate, ca. 2 mm, hairy; petiolules 2–3 mm; leaflet blades opposite, ovate, elliptic, or ovate-lanceolate, 2.7–8 × 1.7–3.2 cm, papery, abaxially with appressed brown medifixed trichomes, adaxially glabrous, midvein abaxially obviously prominent and adaxially impressed, secondary veins 6–9 on each side of midvein, base rounded to cuneate, apex acute to acuminate and mucronate. Racemes 12–20 cm; peduncle 1.5–2 cm, with spreading brown asymmetrically crooked trichomes; bracts bristlelike, 4–6 mm, abaxially with brown trichomes. Pedicel ca. 1 mm but to 2 mm and deflexed in fruit. Calyx campanulate, 2–3 mm, with appressed medifixed trichomes; tube 1.5(–2) mm; teeth triangular, 0.5–1 mm. Corolla white; standard broadly ovate, 7–8 × ca. 5 mm, outside with appressed brown trichomes, base truncate, apex obtuse; wings as long as standard; keel 7–8 mm, outside hairy, spurred. Stamens 6–8 mm; anthers ovoid, glabrous. Ovary hairy or glabrous. Legume brown, cylindrical, 5–6.5 cm, with dense appressed brown medifixed trichomes, sutures thickened; endocarp blotched. Seeds 11 or 12 per legume. Fl. Aug–Oct, fr. Oct–Dec.

Mountain slopes, valleys, trailsides, scrub, woodlands; 600–2000 m. Guangxi, S Guizhou, S Yunnan [N Laos].

37. *Indigofera hirsuta* Linnaeus, Sp. Pl. 2: 751. 1753.

硬毛木藍 ying mao mu lan

Shrubs or shrublets, erect, 30–100 cm tall. Stems rufous, with spreading rust-colored basifixed extremely asymmetrically

2-branched trichomes looking like simple trichomes. Stipules narrowly triangular, 1–1.2 cm. Leaves 2.5–10 cm, 5–9-foliolate; petiole and rachis adaxially grooved, with spreading rust-colored basifixed trichomes; petioles 0.8–1.2 cm; stipels 1–2 mm; petiolules 1.5–2 mm; leaflet blades opposite, elliptic to obovate, 1.5–3.5 × 0.7–2 cm, both surfaces with dense spreading gray basifixed trichomes, midvein abaxially prominent, secondary veins 4–6 on each side of midvein, base cuneate, apex rounded and with a ca. 0.2 mm mucro. Racemes 10–20 cm, densely flowered; bracts linear-triangular, ca. 4 mm, caducous. Pedicel ca. 2 mm, deflexed after flowering. Calyx 4–6 mm, with spreading gray basifixed trichomes; tube ca. 1 mm; teeth setaceous, 3–5 × as long as tube. Corolla red; standard with white blotches at base, obovate-elliptic, 4–5 × 3–4 mm, outside hairy; wings 4–5 × 1.2–1.5 mm, glabrous, apical margin hairy; keel white with a red tip, 4–5 × 1.2–2.5 mm, glabrous, apical margin hairy, spur ca. 0.7 mm. Stamens 3–4.5 mm; anthers ovoid. Ovary hairy, with 6–9 ovules. Legume cylindrical, straight, round in cross section, 1.5–2 cm × 2–2.5 mm, with spreading trichomes; endocarp black blotched. Seeds 6–9 per legume, brown, cubic. Fl. Jul–Sep, fr. Oct–Dec. $2n = 16$.

Open slopes, trailsides, grasslands near rivers, sandy ground near seashores; below 100 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, SE Yunnan, Zhejiang [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Pacific islands].

38. *Indigofera argutidens* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 65. 1913.

尖齿木蓝 jian chi mu lan

Indigofera canocalyx Gagnepain; *I. leptosepala* Diels (1912), not Nuttall (1838).

Shrubs or shrublets, 30–80 cm tall, many branched. Stems terete toward base, angular when young, with dense spreading long stiff brown trichomes and some short and submedifixed 2-branched trichomes. Stipules linear, 8–10 mm, persistent, with dense long spreading white or brown stiff trichomes. Leaves 3.5–8 cm, 7–13(or 15)-foliolate; petiole and rachis with dense spreading long stiff brown trichomes; petiole 3–5 mm; rachis adaxially grooved; stipels absent; petiolules ca. 1 mm; leaflet blades opposite, elliptic, oblong, obovate, or obovate-oblong, 0.7–2(–2.5) × 0.4–0.9(–1.3) cm, papery, both surfaces with sparse ± spreading white or gray and long basifixed to subbasifixed trichomes, abaxially with long stiff brown basifixed trichomes along midvein, midvein adaxially obviously depressed, secondary veins not visible, base cuneate to rounded, apex obtuse to emarginate and with a 1.5–3 mm mucro. Racemes ca. 3.5 cm; peduncle and rachis with dense spreading long stiff white trichomes; peduncle ca. 1.2 cm; bracts linear, 7–8 mm, abaxially with long white trichomes. Pedicel 2–2.5 mm but to 4 mm in fruit, with long stiff white trichomes. Calyx ca. 5 mm, outside with long stiff spreading white trichomes; tube ca. 1.5 mm; teeth narrowly triangular, 2–3(–4) mm. Corolla purplish red; standard broadly elliptic, 9–11 × ca. 5 mm, outside with spreading white long soft trichomes; wings ca. 9 mm, base auriculate, margin ciliate; keel 0.9–1.1 cm, outside apically hairy, margin ciliate, spur minute. Stamens 9–10 mm; anthers ovoid-globose, glabrous or base very sparsely hairy. Ovary gla-

brous, with more than 10 ovules. Legume cylindrical, 2–3 cm, glabrescent; endocarp blotched. Seeds 8 or 9 per legume. Fl. May–Jul, fr. Sep.

• Grasslands, thickets, *Pinus* forests; 2000–3000 m. NW Yunnan.

39. *Indigofera pampaniniana* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 58. 1913.

昆明木蓝 kun ming mu lan

Indigofera duclouxii Craib; *I. mairei* Pampanini var. *proterantha* Pampanini; *I. proterantha* (Pampanini) Gagnepain.

Shrubs, 20–80 cm tall. Stems brown; old branches terete, with strumose lenticels; young branches angular, with densely ascending brown and white subbasifixed or basifixed curly asymmetrically 2-branched trichomes, glabrescent. Stipules narrowly lanceolate, 7–8 mm. Leaves to 15 cm, 11–19(–23)-foliolate; petiole and rachis with ascending basifixed or subbasifixed trichomes; petiole to 2.2 cm; rachis adaxially grooved; stipels subulate, ca. 3 mm, persistent; petiolules 1.5–2 mm, with brown trichomes; leaflet blades opposite, oblong, 1.5–3 × 1–1.5 cm, papery, both surfaces with appressed white medifixed trichomes, abaxially with long trichomes on midvein, midvein slightly prominent, secondary veins 8 or 9 on each side of midvein and obvious on both surfaces, base rounded to slightly cordate, apex obtuse to retuse and with a ca. 1 mm mucro. Racemes produced before leaves, 3–6 cm; peduncle and rachis with ascending trichomes; peduncle ca. 5 mm; bracts linear-lanceolate, 2.5–3 mm, caducous, outside with brown trichomes, margin ciliate. Pedicel ca. 2 mm but to 4 mm in fruit. Calyx ca. 5 mm, with ascending medifixed trichomes; tube ca. 2.5 mm; teeth lanceolate, most abaxial one as long as tube. Corolla purple; standard obovate-elliptic, 1.3–1.5(–1.8) × 0.8–0.9 cm, outside with appressed white trichomes at base, margin ciliate; wings 1.2–1.3 cm; keel as long as wings, outside apically sparsely hairy, spurs ca. 1 mm. Stamens 1.4–1.5 cm; anthers ovoid, base hairy. Ovary glabrous, with 11 or 12 ovules. Legume cylindrical, ca. 4.5 cm, with minute appressed white medifixed trichomes, glabrescent; endocarp blotched. Fl. Mar–Jun, fr. Aug–Nov.

• Dry scrub slopes; 2000–2100 m. Yunnan.

40. *Indigofera esquirolii* H. Léveillé, Repert. Spec. Nov. Regni Veg. 12: 190. 1913.

黔南木蓝 qian nan mu lan

Indigofera arborea Gagnepain (1915), not Roxburgh (1832); *I. neoarborea* Hu ex F. T. Wang & Tang.

Shrubs, 1–4 m tall. Stems nut-brown, terete, with round yellowish lenticels; young branches brown, angular, with dense spreading long brown or rufous subbasifixed asymmetrically 2-branched trichomes and short subsymmetrically 2-branched trichomes. Stipules linear, 5–8 mm, caducous, densely hairy. Leaves ca. 12 cm, 9–15-foliolate; petiole and rachis terete and adaxially grooved, indumentum same as branches; petiole 1–1.5 cm; stipels subulate, ca. 1 mm, with brown trichomes; petiolules ca. 1.5 mm, with spreading brown trichomes; leaflet blades opposite, elliptic, broadly obovate, or obovate-elliptic, 2–3 × 1–1.7 cm, papery, abaxially with long white trichomes,

midvein with spreading brown trichomes, adaxially with shorter spreading brown subbasifixed to medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 4 or 5 on each side of midvein, base cuneate to rounded, apex rounded to truncate and with a ca. 1 mm mucro. Racemes ca. 12 cm; peduncle 1–1.3 cm; rachis striate, with spreading brown trichomes; bracts linear, ca. 4 mm, abaxially with subbasifixed 2-branched brown trichomes. Pedicel ca. 3 mm. Calyx with spreading brown subbasifixed 2-branched trichomes; tube 2–2.5 mm; teeth lanceolate-subulate, 2.5–3.5 mm. Corolla white; standard elliptic to oblong, 11–14 × ca. 5 mm, outside with appressed white medifixed-subbasifixed trichomes, base rounded, apex obtuse and with a ca. 1 mm mucro; wings ca. 13 × 2 mm, base auriculate, margin ciliate; keel ca. 1.5 cm, outside apically hairy, claw ca. 1 mm. Stamens 1.2–1.3 cm; anthers ovoid, glabrous. Ovary hairy, with 13–15 ovules. Legume cylindrical, ca. 4.5 cm, with appressed brown trichomes. Seeds 14 or 15 per legume. Fl. Apr–Aug, fr. Jul–Aug.

• Woodlands, scrub; 400–2500 m. N Guangxi, S Guizhou, E Yunnan.

41. *Indigofera dumetorum* Craib, Notes Roy. Bot. Gard. Edinburgh 9: 109. 1916.

黄花木蓝 huang hua mu lan

Shrubs, to 2.5 m tall. Stems rufous brown or gray, terete, with obvious lenticels; young branches striate, with spreading brown medifixed subsymmetrically crooked 2-branched trichomes. Stipules narrowly lanceolate, 5–8 mm, caducous. Leaves ca. 13 cm, 5–9-foliolate; petiole and rachis terete, adaxially slightly flattened, with dense spreading white crooked medifixed trichomes; petiole ca. 2 cm; stipules not visible; petiolules ca. 2 mm; leaflet blades opposite or subopposite, oblong, elliptic, or ovate, 2–5 × 1.5–2.5 cm, thickly papery, abaxially with dense spreading white medifixed crooked trichomes, adaxially with appressed white medifixed trichomes, midvein abaxially prominent and adaxially slightly impressed, secondary veins 8–10 on each side of midvein, base broadly cuneate to rounded, apex obtuse to acute. Racemes ca. 15 cm; peduncle and rachis with dense spreading white medifixed trichomes and crooked trichomes; peduncle 2–3 cm; rachis striate; bracts caducous. Pedicel 2–4 mm, hairy. Calyx campanulate, 4.5–5 mm, with dense spreading brown submedifixed crooked trichomes; tube ca. 2.5 mm; teeth triangular, unequal, most abaxial one as long as tube. Corolla yellowish; standard ovate-oblong, 1.2–1.7 × 0.6–0.7 cm, outside with appressed white trichomes, base not clawed, apex emarginate; wings 10–12 × ca. 2.5 mm, outside glabrous, margin ciliate; keel as long as standard, outside with appressed brown trichomes on top part, clawed at base, spur ca. 0.5 mm. Stamens 1.3–1.6 cm; anthers ovoid-ellipsoid, glabrous. Ovary with 12–15 ovules. Legume slightly compressed, ca. 7 cm, with spreading brown or gray submedifixed trichomes, apex hooked. Fl. Jun, fr. Aug–Sep.

• Dry woodlands; 2100–2700 m. SW Sichuan, NW Yunnan.

42. *Indigofera stachyodes* Lindley, Bot. Reg. 1: t. 14. 1843.

茸毛木蓝 rong mao mu lan

Indigofera bodinieri H. Léveillé; *I. dosua* Buchanan-

Hamilton ex D. Don var. *stachyodes* (Lindley) H. Léveillé; *I. dosua* var. *tomentosa* Baker.

Shrubs, 1–3 m tall. Stems grayish brown; young branches angular, with dense long spreading brown basifixed or subbasifixed extremely asymmetrically 2-branched trichomes and short appressed submedifixed symmetrically 2-branched trichomes. Stipules linear, 5–6 mm, with ascending basifixed trichomes. Leaves 10–20 cm, (19–)31–41-foliolate; petiole and rachis with densely ascending basifixed trichomes; petiole very short, adaxially grooved; leaflet blades opposite, subopposite, or alternate, lanceolate-oblong but terminal one obovate-oblong, 1.2–2 × 0.4–0.9 cm, both surfaces with densely ascending brown to grayish brown basifixed trichomes, midvein adaxially slightly impressed, secondary veins not visible, base cuneate to rounded, apex obtuse to acute. Racemes ca. 12 cm, many flowered; peduncle and rachis with dense spreading basifixed trichomes; peduncle longer than petioles; bracts linear, ca. 7 mm, hairy. Pedicel ca. 1.5 mm, hairy. Calyx ca. 3.5 mm, with long spreading brown basifixed trichomes; tube ca. 1.5 mm; teeth lanceolate, most abaxial one ca. 2 mm. Corolla yellowish; standard elliptic, 10–11 × ca. 5 mm, outside with appressed long trichomes; wings ca. 9.5 mm, glabrous; keel ca. 1 cm, outside ciliate and hairy on top. Stamens 9–10.5 mm; anthers ovoid, glabrous. Ovary hairy. Legume subcylindric, deflexed, 3–4 cm, with densely ascending basifixed trichomes; endocarp blotched with purple. Seeds more than 10 per legume, reddish brown, cubic, ca. 2 × 2 mm. Fl. Apr–Jul, fr. Aug–Nov.

Sunny places, scrub; 700–2400 m. NW Guangxi, Guizhou, SW Hubei, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Myanmar, Nepal, Thailand, Vietnam].

43. *Indigofera dosua* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 244. 1825.

滇西木蓝 dian xi mu lan

Indigofera polyphylla Candolle; *I. virgata* Roxburgh.

Shrubs, 5–20 cm tall. Stems striate, with dense spreading brown 2-branched trichomes with very unequally long arms. Stipules linear, 7–10 mm, abaxially with spreading white or brown trichomes. Leaves 4–10 cm, 13–39-foliolate; petiole absent; rachis with dense spreading brown trichomes; stipules minute or absent; petiolules ca. 1 mm; leaflet blades elliptic to oblong, 7–15 × 4–6 mm, abaxially with dense subbasifixed trichomes, adaxially with slender white appressed medifixed trichomes, secondary veins not visible, base cuneate to rounded, apex obtuse to rounded and mucronate. Racemes 5–15 cm; peduncle and rachis with dense spreading long white trichomes; peduncle 4–7 mm; bracts linear to narrowly triangular, 8–10 mm, abaxially with long spreading white trichomes. Pedicel ca. 3 mm, with long spreading trichomes. Calyx ca. 3 mm, outside with long spreading white trichomes; tube ca. 2 mm; teeth triangular, ca. 1 mm. Corolla pink; standard elliptic to oblong, 8–10 × ca. 4.5 mm, outside with dense spreading brown or white long trichomes, apex mucronate; wings oblong, 8–9 mm, glabrous, margin ciliate; keel 8–9 mm, outside apically with spreading white trichomes, margin ciliate, apex acute. Stamens 7.5–9 mm; anthers hairy at base. Ovary with dense appressed white trichomes. Legume linear, cylindrical, deflexed to

spreading, 3–4 cm × 3–4 mm, with white appressed 2-branched trichomes; endocarp not blotched. Seeds 6–10 per legume, dark brown, cubic, 1.5–2 × 1.5–2 mm. Fl. Apr–Jun, fr. Jun–Aug.

Valley slopes; 1800–2500 m. W Yunnan [Bhutan, India, Indonesia, Laos, Myanmar, Nepal, Thailand, Vietnam].

44. *Indigofera penduloides* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 333. 1983.

拟垂序木蓝 ni chui xu mu lan

Shrubs. Stems pale grayish brown, terete, ca. 6 mm thick, with lenticels; branches purplish red, angulate, with spreading brown and submedifixed 2-branched trichomes, glabrescent. Stipules linear, 3–5 mm. Leaves 12–22 cm, 17–23-foliolate; petiole and rachis adaxially grooved, with sparse brown submedifixed trichomes; petiole 2.3–5 cm; stipels not visible; petiolules ca. 2 mm; leaflet blades ovate-oblong to elliptic-lanceolate, 2.5–4.5 × 0.8–1.6 cm, both surfaces with appressed medifixed trichomes, secondary veins 6–8 on each side of mid-vein and adaxially obvious, base cuneate to broadly cuneate, apex obtuse to emarginate and mucronate. Racemes 30–45 cm, usually drooping; peduncle 1.5–4 cm, striate, with spreading brown submedifixed trichomes; bracts lanceolate, ca. 3 mm. Pedicel 2–3 mm. Calyx tube 1.2–1.5 mm; teeth triangular, ca. 1.5 mm. Corolla standard broadly oblong to obovate-oblong, 12–13 × ca. 6 mm, outside with appressed grayish brown trichomes; wings ca. 11 × 2.5 mm; keel 12–13 × ca. 3 mm, spurred at middle. Stamens 1.1–1.2 cm; anthers ellipsoid, glabrous. Ovary, style, and stigma all hairy; ovules 12 or 13. Fl. Sep, fr. unknown.

• Scrub, forests; ca. 1700 m. W Yunnan (Weishan).

45. *Indigofera jikongensis* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 329. 1983.

鸡公木蓝 ji gong mu lan

Shrubs, to 4 m tall. Stems obviously 4-sided, with spreading submedifixed 2-branched trichomes. Stipules lanceolate, 5–8 mm, caducous. Leaves 11–22 cm, 5–9-foliolate; petiole and rachis with spreading submedifixed or subbasifixed trichomes; petiole 1.5–5.5 cm; stipels linear, 2–4 mm, with spreading subbasifixed white trichomes; petiolules ca. 2 mm; leaflet blades opposite, ovate, ovate-elliptic, or obovate-elliptic, 2.8–7.5 × 1.5–4 cm, abaxially with spreading white medifixed or long subbasifixed trichomes, adaxially with short appressed medifixed trichomes, base broadly cuneate, apex obtuse, emarginate, or acute and mucronate. Racemes 11–20 cm; peduncle 3.5–6 cm, with spreading subbasifixed trichomes. Pedicel 2–3 mm, slender, with spreading subbasifixed trichomes. Calyx with spreading white crooked trichomes; tube 1.5–2 mm; teeth triangular, 1–1.3 mm. Corolla purple; standard broadly oblong, 1.3–1.4 × ca. 0.8 cm, outside with appressed white crooked trichomes; wings 13.5–14.5 × ca. 4 mm, glabrous, base auriculate; keel as long as wings, spur ca. 1.5 mm. Anthers ovoid, both ends hairy. Ovary glabrous, with 9 ovules. Fl. May, fr. unknown.

• Scrub, mixed forests; ca. 1300 m. Henan, Hubei.

46. *Indigofera cylindracea* Graham ex Baker in J. D. Hooker, Fl. Brit. India 2: 99. 1876.

筒果木蓝 tong guo mu lan

Indigofera heterantha Wallich ex Brandis var. *longipedicellata* Thothathri.

Shrubs, erect or ascending, 80–100 cm tall. Stems striate, with sparse spreading 2-branched trichomes with unequally long arms. Stipules triangular, 2–4 mm, persistent, with appressed brownish 2-branched trichomes. Leaves 4–6 cm, 11–15-foliolate; petiole and rachis adaxially grooved, with brownish 2-branched trichomes; petiole 5–10 mm; stipels ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, elliptic to oblong, 7–15 × 3–5 mm, abaxially with medifixed trichomes, adaxially with appressed white unequally 2-branched trichomes, base cuneate, apex obtuse to rounded and mucronate. Racemes 5–9 cm; peduncle and rachis with spreading brownish 2-branched trichomes; peduncle ca. 1.5 cm; bracts narrowly triangular, 1.5–2 mm, caducous. Pedicel 4–6 mm but to 1 cm in fruit, with spreading brownish 2-branched trichomes. Calyx outside with appressed brownish 2-branched trichomes; tube ca. 1.8 mm; teeth triangular, 0.5–0.8 mm. Corolla pink; standard obovate, 7–9 × 4–6 mm, outside with appressed 2-branched trichomes, apex mucronate; wings 6.5–8 × 2–3.5 mm, glabrous; keel as long as standard, spur ca. 1 mm. Stamens 7–8 mm; anthers ovoid. Ovary glabrous, with 8–10 ovules. Legume cylindrical, 4–5 cm × 3–4 mm, glabrous. Seeds 8–10 per legume. Fl. May–Jul, fr. Jul–Sep.

Forest margins, grasslands on slopes; 2200–2400 m. S Xizang [Bhutan, India, Myanmar, Nepal].

47. *Indigofera lacei* Craib, Bull. Misc. Inform. Kew 1910: 382. 1910.

思茅木蓝 si mao mu lan

Indigofera simaoensis Y. Y. Fang & C. Z. Zheng.

Shrublets, 80–100 cm tall. Stems slightly terete, striate; young branches with dense spreading primarily basifixed asymmetrically 2-branched long trichomes, glabrescent. Stipules linear, 5–10 mm. Leaves ca. 11 cm, 17–25-foliolate; petiole 5–10 mm; rachis adaxially flattened; stipels linear, as long as petiolules; petiolules 1.5–2 mm; leaflet blades opposite, oblanceolate to oblong, 7–15 × 4–6 mm, papery, both surfaces with appressed white medifixed trichomes, base broadly cuneate to rounded, apex obtuse to rounded and mucronate. Racemes ca. 16 cm; peduncle ca. 3 cm, with brown trichomes; bracts caducous. Pedicel 3–4 mm. Calyx tube ca. 1.5 mm; teeth triangular, ca. 0.5 mm. Corolla dark purple; standard broadly oblong, ca. 8 × 6 mm; wings as long as keel. Stamens 6.5–7 mm; anthers ovoid, glabrous. Ovary glabrous. Legume purple, 3–3.5 cm, glabrous. Seeds cubic, ca. 2 mm. Fl. Sep, fr. Nov.

Moist thickets; ca. 1400 m. S Yunnan [India, Myanmar, Thailand].

48. *Indigofera henryi* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 54. 1913.

亨利木蓝 heng li mu lan

Indigofera henryi var. *silvarum* Craib; *I. souliei* Craib; *I.*

subsecunda Gagnepain; *I. subverticillata* Gagnepain, nom. illeg. superfl.

Shrubs or shrublets, erect or ascending, 30–100 cm tall, many branched. Branches brown, angular, with appressed white medifixed 2-branched trichomes. Stipules linear, ca. 5 mm. Leaves 3–10 cm, 11–19-foliolate; petiole 3–10 mm; rachis adaxially flattened, slightly winged, with appressed white medifixed trichomes; stipels ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, oblong-obovate, 1.7–2.3 × 0.5–1.2 cm, papery, abaxially with spreading unequally 2-branched trichomes, adaxially with appressed medifixed trichomes, midvein prominent on both surfaces, secondary veins 4–6 on each side of midvein but not visible or obscure, base broadly cuneate, rounded, or truncate, apex rounded. Racemes (3–)4–9(–12) cm, laxly flowered; peduncle 7–12 mm, with sparse medifixed trichomes; bracts linear, 2–2.5 mm, caducous. Pedicel 2–6(–9) mm, deflexed in fruit. Calyx 2–3 mm, outside with appressed white medifixed trichomes; tube 1–1.5 mm; teeth triangular, 1–1.5 mm, apex acuminate. Corolla white; standard obovate, 7–9 × 5–6 mm, outside densely white puberulent with medifixed trichomes, base rounded, apex rounded to acute; wings 7–8 × ca. 2.5 mm, margin ciliate; keel 7–9 mm. Stamens 7–8 mm; anthers ovoid-globose, base densely hairy. Ovary hairy. Legume brown, cylindrical, 2.5–3 cm, with sparse appressed medifixed trichomes; endocarp blotched. Fl. Aug–Sep, fr. Oct–Nov.

• Grasslands, slopes, scrub near trailsides; 1200–2500 m. Guizhou, S Sichuan, Yunnan.

Indigofera subverticillata was nomenclaturally superfluous when published, and is therefore illegitimate, because the single gathering cited in the protologue is also the type of the senior name *I. souliei*.

49. *Indigofera myosurus* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 58. 1913.

华西木蓝 hua xi mu lan

Shrublets, erect, 0.8–1.2 m tall, many branched. Branches brown, angular, with appressed white medifixed 2-branched trichomes. Stipules linear, ca. 5 mm. Leaves 5–8.5 cm, 11–19-foliolate; petiole 5–10 mm; rachis adaxially flattened, slightly winged, with appressed white medifixed trichomes; stipels ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, elliptic-obovate, 1–1.8 × 0.4–0.8 cm, papery, both surfaces with sparse appressed medifixed trichomes, abaxially with longer trichomes, midvein prominent on both surfaces, secondary veins 4–6 on each side of midvein and abaxially visible, base broadly cuneate to obtuse, apex rounded to obtuse and mucronate. Racemes 4–9 cm, laxly flowered; peduncle 0.8–1.6 cm, with sparse medifixed trichomes; bracts linear, 2–2.5 mm, caducous. Pedicel 2–5 mm, deflexed in fruit. Calyx 4–5 mm, outside with appressed white medifixed trichomes; tube 1.5–2 mm; teeth lanceolate, 2–3 mm, apex acuminate. Corolla light pink; standard obovate, 8–10 × 5–6 mm, outside minutely puberulent, base rounded, apex rounded to acute; wings 7–9 × ca. 2.5 mm, margin ciliate; keel 7–10 mm, apex acute. Stamens 8–9 mm; anthers ovoid-globose, base densely hairy. Ovary hairy. Legume brown, cylindrical, 2.5–3 cm, with sparse appressed medifixed trichomes; endocarp blotched. Fl. May–Jun, fr. Aug.

• Hill slopes, forest margins; 1600–2800 m. Sichuan, N Yunnan.

50. *Indigofera reticulata* Franchet, Pl. Delavay. 153. 1889.

网叶木蓝 wang ye mu lan

Indigofera craibeana H. Léveillé.

Subshrubs, sometimes prostrate, 10–30 cm tall, branching from base. Young branches slender, angular, with appressed brown medifixed symmetrically 2-branched trichomes. Stipules linear, 3–4 mm. Leaves 2–6 cm, 5–13-foliolate; petiole and rachis hairy; petiole 4–11 mm; rachis terete, adaxially grooved; stipels ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, oblong to elliptic, 5–17 × 3–7 mm, papery, both surfaces with white and brown appressed medifixed trichomes, midvein adaxially prominent, secondary veins 5 or 6 on each side of midvein and obvious, base rounded to subcordate, apex obtuse to emarginate and mucronate. Racemes 2–4 cm; peduncle 4–5 mm, hairy; bracts linear, ca. 2 mm. Pedicel 2–3 mm. Calyx ca. 3 mm, outside hairy; teeth lanceolate-subulate, as long as tube. Corolla purple; standard broadly ovate, 6–7 mm, outside hairy, apex rounded; wings 7–9 mm, margin ciliate; keel as long as wings, outside hairy, apically tapering and acute. Stamens 4–5 mm, much shorter than petals; anthers ovoid, base with a few trichomes. Ovary glabrous. Legume cylindrical, 1–2 cm, with appressed medifixed trichomes; endocarp blotched. Seeds rufous brown, ellipsoid, 1.5–2 mm. Fl. May–Jul, fr. Sep–Dec.

Forests, scrub, grassland slopes; 1200–3000 m. W Guizhou, SW Sichuan, S Xizang, Yunnan [Thailand].

51. *Indigofera muliensis* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 333. 1983.

木里木蓝 mu li mu lan

Shrubs, 60–100 cm tall. Stems terete but 4-angled when young, with lenticels, glabrous; young branches 4-ribbed, glabrous. Stipules lanceolate, 5–6(–10) mm. Leaves 3–7.5 cm, 5–9-foliolate; petiole 1–2 cm, glabrous; stipels as long as petiolules; petiolules 1–1.5 mm; leaflet blades opposite, oblong to ovate-oblong, 1–3 × 0.6–1.5 cm, papery, abaxially with appressed white and brown medifixed trichomes, adaxially glabrous, secondary veins 4–6 on each side of midvein, base rounded, apex obtuse to acute and mucronate. Racemes 4–8 cm; peduncle 0.5–2 cm, glabrous; bracts ovate, ca. 1.5 mm. Pedicel ca. 1.5 mm but to 4 mm in fruit. Calyx tube ca. 1 mm; teeth triangular to triangular-subulate, 1–1.5 mm. Corolla purplish red; standard 5.5–7.5 × 3.5–4.5 mm, outside hairy; wings 6–7 × ca. 2 mm; keel 6–7 × ca. 1.5 mm, spur ca. 1.5 mm. Stamens 5–6.5 mm; anthers broadly ovoid, glabrous. Ovary glabrous, with 1 ovule. Legume dark brown, cylindrical, 3–3.5 cm, glabrous. Fl. May–Jun, fr. Jun–Jul.

• Moist slopes, forests, *Pinus* forests; 2100–3200 m. Sichuan, Yunnan.

52. *Indigofera megaphylla* X. F. Gao, Novon 19: 160. 2009.

大叶木蓝 da ye mu lan

Shrubs, 1–2 m tall, erect. Stems with dense spreading brownish 2-branched trichomes with equally long arms. Stipules narrowly triangular, 5–6 mm. Leaves 12–15 cm, (1 or 3- or 5(or 7)-)foliolate; petiole and rachis terete, with sparse brownish

2-branched trichomes; petiole 3–5 cm; stipels 2–3 mm; petiolules 3–4 mm; leaflet blades oblong, ovate-oblong, or obovate-oblong, 5–8 × 4–6 cm, abaxially with long white 2-branched trichomes, adaxially with short spreading brownish 2-branched trichomes, primary to tertiary venation markedly impressed adaxially and prominent abaxially, secondary veins 9–14 on each side of midvein, base rounded to cuneate, apex obtuse to emarginate. Racemes 5–13 cm; peduncle and rachis with very dense spreading brown 2-branched trichomes; peduncle 3–5 mm; bracts ovate, ca. 2.5 × 1.2 mm, abaxially with appressed trichomes. Pedicel 0.5–1 mm. Calyx 2.5–3 mm, outside with dense spreading trichomes; tube ca. 1 mm; teeth narrowly triangular, 1.5–2 mm. Corolla purple, 7–8 mm; standard ovate-oblong, 4–4.5 mm wide, outside with spreading white trichomes; wings narrowly oblong, 1.6–1.8 mm wide, margin ciliate; keel densely spreading white pubescent distally and along upper margin, spur ca. 1 mm. Stamens 5.5–6 mm; anthers glabrous. Ovary densely pubescent with white and brown hairs. Legume (3–)4–5 cm, with dense spreading gray or pale brown trichomes; endocarp not blotched. Seeds 9–12 per legume, dark brown. Fl. Apr–May, fr. May–Jul.

- Scrub, trailsides; 1200–1600 m. S Yunnan (Shiping, Yuanjiang).

53. *Indigofera balfouriana* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 48. 1913.

丽江木蓝 li jiang mu lan

Indigofera dielsiana Craib.

Shrubs, 0.6–2 m tall. Old stems blackish brown, angular; young branches brown, angular, with spreading or subspreading mixed appressed pale brown or white 2-branched trichomes, glabrescent. Stipules narrowly lanceolate, 3–6 mm, hairy. Leaves 3–9 cm, 5–9-foliolate; petiole and rachis terete, adaxially grooved, with spreading curly medifixed trichomes; petiole 1–2.3 cm; stipels subulate, ca. 1 mm; petiolules ca. 1.5 mm, hairy; leaflet blades opposite, elliptic, 0.6–2.6 × 0.4–1.3 cm, papery, both surfaces with ± spreading white medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins not visible, base broadly cuneate to rounded, apex rounded to emarginate and with a ca. 0.3 mm mucro. Racemes 2–6 cm; peduncle and rachis with spreading medifixed trichomes; peduncle 0.5–1.5 cm; bracts ovate, ca. 3 mm, abaxially with spreading trichomes. Pedicel 1–3 mm, with spreading white 2-branched trichomes. Calyx 2–3 mm, with spreading submedifixed to subbasifixed 2-branched trichomes; tube 1–2 mm; teeth lanceolate, 1–1.5 mm. Corolla red to purple; standard nearly rounded, 6–9.5 × 5–6 mm, sessile, outside with spreading white soft trichomes, apex slightly emarginate; wings 7–9.5 × ca. 2 mm, base auriculate, margin ciliate; keel 7.5–8.5 mm, outside apically with sparse spreading white trichomes, margin ciliate, spur ca. 1 mm. Stamens (5.5–)6–7 mm; anthers ovoid-globose, glabrous. Ovary densely white hairy, with 10 or 11 ovules. Legume brown, cylindrical, 2.5–4 cm, hairy; endocarp blotched. Seeds 6–10 per legume. Fl. Apr–Jul, fr. Jul–Sep.

- Scrub, forests; 2100–3000 m. Sichuan, S Xizang, W Yunnan.

54. *Indigofera sticta* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 61. 1913.

矮木蓝 ai mu lan

Subshrubs, to 70 cm tall. Stems nut-brown, angular; young branches with appressed medifixed symmetrically 2-branched trichomes. Stipules narrowly lanceolate, ca. 3.5 mm. Leaves 4–9 cm, 3- or 5-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 3–3.5 cm; stipels minute; petiolules ca. 2.5 mm; leaflet blades opposite, elliptic to ovate-elliptic, 2.5–4 × 1.7–2.8 cm, papery, abaxially with dense medifixed trichomes, adaxially with appressed medifixed trichomes, midvein adaxially slightly impressed, secondary veins 5 or 6 on each side of midvein, base rounded, apex obtuse to emarginate and mucronate. Racemes 5(–9) cm; peduncle and rachis with dense appressed white medifixed trichomes; peduncle 1.3–1.7 cm; bracts ovate, ca. 1.5 mm, caducous. Pedicel ca. 2 mm. Calyx ca. 3.5 mm, with appressed medifixed trichomes; tube 1.5–2 mm; teeth triangular, ca. 1.5 mm. Corolla purplish red to purple; standard elliptic to obovate-elliptic, 6.5–8 × 3.5–4 mm, outside hairy; wings ca. 6 mm, base auriculate, margin ciliate; keel ca. 6.5 mm, apically hairy, spur ca. 1 mm. Stamens 7–8 mm; anthers ovoid, glabrous. Ovary glabrous. Fl. May, fr. unknown.

- Forests; ca. 1800 m. Yunnan.

55. *Indigofera dichroa* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 50. 1913.

川西木蓝 chuan xi mu lan

Shrubs, 1–1.5 m tall. Stems blackish brown, terete; young branches angular, primarily with appressed white and brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules linear, 4–6 mm. Leaves 4–8 cm, 3- or 5-foliolate; petiole and rachis with appressed medifixed trichomes; petiole 1.2–3.5 cm; rachis adaxially grooved; stipels minute, caducous; petiolules 1.5–2 mm, hairy; leaflet blades opposite, elliptic, ovate-elliptic, or elliptic-obovate, 1–4 × 0.8–5.5 mm, papery, abaxially with dense appressed short medifixed trichomes, adaxially with longer medifixed trichomes, midvein adaxially prominent, secondary veins 6 on each side of midvein, base cuneate to rounded, apex obtuse to acuminate and mucronate. Racemes ca. 6 cm; peduncle and rachis with dense appressed white medifixed trichomes; peduncle 5–9 mm; bracts ovate, ca. 1.5 mm, caducous. Pedicel ca. 1.5 mm, trichomes white. Calyx 3–3.5 mm, outside with appressed medifixed trichomes; tube ca. 2 mm; teeth triangular-lanceolate, 1–1.5 mm. Corolla pinkish; standard elliptic-obovate, 8.5–11 × 3–3.5 mm, outside hairy, base acuminate, apex obtuse; wings 8.5–11 mm; keel slightly longer than other petals. Stamens 8–9 mm; anthers ovoid-globose, glabrous. Ovary densely appressed white hispid; style glabrous. Legume brown, linear, cylindrical, ca. 4.5 cm, appressed white hispid; endocarp not blotched. Seeds cubic. Fl. May–Jun, fr. Jul–Aug.

- Grasslands, scrub; 1300–2000 m. Sichuan, N Yunnan.

56. *Indigofera amblyantha* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 47. 1913.

多花木蓝 duo hua mu lan

Indigofera amblyantha var. *purdomii* Rehder.

Shrubs, erect, 0.8–2(–3) m tall. Stems brown to pale brown, terete; young branches 4-sided, with dense appressed white medifixed symmetrically 2-branched trichomes, glabrescent. Stipules triangular-lanceolate, ca. 1.5 mm. Leaves to 18 cm, 5–9(–13)-foliolate; petiole and rachis with appressed medifixed trichomes; petiole (1.5–)2–5 cm; stipels minute; petiolules ca. 1.5 mm, hairy; leaflet blades opposite or rarely alternate, obovate-oblong, oblong-elliptic, elliptic, or orbicular, 1–4(–5) × 0.8–2 cm, abaxially pale and with dense appressed medifixed trichomes, adaxially green and with sparse appressed medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 4–6 on each side of midvein, base cuneate to broadly cuneate, apex rounded-obtuse and mucronate. Racemes 11–15 cm, subspicate, sessile or peduncle to 5 mm; bracts linear, ca. 2 mm, caducous. Pedicel 1–2(–2.5) mm. Calyx 2–3.5 mm, with appressed white medifixed trichomes; tube 1–1.5 mm; teeth 1.5–2 mm. Corolla pink; standard obovate, 6–6.5 mm, somewhat hooded at apex, outside hairy; wings ca. 7 mm; keel shorter than wings. Stamens 5–6 mm; anthers globose, apex mucronate. Ovary linear, hairy, with 17 or 18 ovules. Legume brown, cylindrical, straight, 3.5–6 cm, with short appressed medifixed trichomes; endocarp not blotched. Seeds brown, ellipsoid, ca. 2.5 mm. Fl. May–Jul, fr. Sep–Nov. $2n = 48^*$.

• Grasslands near streams, trailsides, scrub at forest margins; 600–1600 m. Anhui, Chongqing, Gansu, Guizhou, Hebei, Henan, Hubei, NW Hunan, Jiangsu, NW Jiangxi, Shaanxi, Shanxi, Sichuan, Zhejiang.

57. *Indigofera bungeana* Walpers, *Linnaea* 13: 525. 1839.

河北木藍 he bei mu lan

Indigofera hosiei Craib; *I. longispica* Gagnepain; *I. micrantha* Bunge (1833), not Desvaux (1826); *I. pseudotinctoria* Matsumura.

Shrubs, erect, 40–100 cm tall. Stems brown, terete; branches whitish gray, with appressed white medifixed symmetrically 2-branched trichomes. Stipules triangular, ca. 1 mm, caducous. Leaves 2.5–5 cm, 5–9(or 11)-foliolate; petiole and rachis with appressed medifixed trichomes; petiole 0.4–1.6(–2) cm; stipels very small; petiolules ca. 0.5 mm; leaflet blades opposite, elliptic, 5–15(–25) × 3–10(–15) mm, abaxially pale green and with longer medifixed trichomes, adaxially green and with sparse appressed medifixed trichomes or glabrescent, base rounded, apex obtuse. Racemes 4–6(–10) cm; peduncle 1–5 mm; bracts linear, ca. 1.5 mm. Pedicel 1–2 mm. Calyx 2–2.5 mm, with appressed white medifixed trichomes; teeth triangular-lanceolate, equal, ca. 2 × as long as tube. Corolla purple to purplish red; standard broadly obovate, 5–6 mm, outside with appressed medifixed trichomes; wings and keel equal, ca. 5.5 mm; keel with spur in middle. Stamens 4–5 mm; anthers globose, apex mucronate. Ovary linear, sparsely hairy. Legume cylindrical, straight, 2–2.5 cm, with appressed white medifixed trichomes; endocarp red blotched. Seeds ellipsoid, ca. 2 mm. Fl. May–Jul, fr. Aug–Oct. $2n = 16$.

Grasslands, river beaches, slopes; 500–2300 m. Anhui, Chongqing, Fujian, Gansu, NE Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, E Xizang, Yunnan, Zhejiang [Japan, Korea].

58. *Indigofera silvestrii* Pampanini, *Nuovo Giorn. Bot. Ital.*, n.s., 17: 397. 1910.

刺序木藍 ci xu mu lan

Indigofera bungeana Walpers var. *nana* L. C. Wang & X. G. Sun; *I. bungeana* f. *spinescens* Kobuski.

Shrubs, 0.6–1.5 m tall, many branched. Stems brown, terete; young branches yellowish green, glabrous. Stipules ca. 1 mm. Leaves 1–2 cm, (5 or)7- or 9-foliolate; petiole and rachis adaxially grooved, with appressed white medifixed trichomes; petiole 4–5 mm; stipels not visible; petiolules ca. 0.5 mm, hairy; leaflet blades opposite, obovate, obovate-oblong, oblong, or elliptic, 3–8 × 2–4 mm, abaxially pale and with appressed medifixed trichomes, adaxially green and glabrous or glabrescent, midvein adaxially impressed, secondary veins not visible, base broadly cuneate to rounded, apex obtuse to rounded and mucronate. Racemes 2–5 cm, many flowered, spinescent; peduncle ca. 5 mm; bracts linear, ca. 1.5 mm, caducous. Pedicel ca. 1 mm, hairy, deflexed in fruit. Calyx ca. 2.5 mm, with appressed medifixed trichomes; tube ca. 1 mm; teeth linear, ca. 1.5 mm. Corolla purplish red; standard obovate, 4.5–5.5 mm, outside hairy, apex rounded; wings auriculate near base, margin ciliate; keel slightly shorter than wings, outside apically hairy. Stamens 3–4 mm; anthers globose, glabrous. Ovary linear, white hairy. Legume cylindrical, straight, 2–3 cm, hairy; endocarp red blotched. Seeds 6 or 7 per legume, reddish brown, oblong to cubic, 2–3 × ca. 2 mm. Fl. Jun–Jul, fr. Aug–Oct.

• Dry slopes, sunny rocks, riverbanks; 100–2700 m. Chongqing, S Gansu, Guizhou, Hubei, S Shaanxi, Sichuan, E Xizang, Yunnan.

59. *Indigofera wightii* Graham ex Wight & Arnott, *Prodr. Fl. Ind. Orient.* 202. 1834.

海南木藍 hai nan mu lan

Indigofera hainanensis H. T. Tsai & T. T. Yu; *I. inamoena* Thwaites; *I. pallida* Craib.

Shrublets, 1–1.5 m tall. Stems with appressed white and brown medifixed symmetrically 2-branched trichomes. Stipules 1.5–2.5 mm, caducous. Leaves 3.5–5 cm, 11–19(–29)-foliolate; petiole and rachis adaxially grooved, with appressed gray medifixed trichomes; petiole ca. 1 cm; stipels minute; petiolules ca. 1 mm; leaflet blades opposite, elliptic-oblong to oblong-lanceolate, 5–10(–15) × 2.5–5(–8) mm, both surfaces with appressed white medifixed trichomes, midvein adaxially impressed and abaxially prominent ending in a tubular gland, secondary veins not visible, base cuneate, apex rounded to acute and mucronate. Racemes 1.5–3.5(–6) cm; peduncle 3–5 mm, with appressed gray medifixed trichomes; bracts triangular, ca. 1.5 mm, caducous. Pedicel 1–2 mm, with spreading trichomes, spreading or reflexed in fruit. Calyx 1.5–2 mm, with appressed medifixed trichomes; tube ca. 1 mm; teeth ovate, 1–1.2 mm. Corolla red; standard broadly ovate, ca. 6 mm, outside with dense 2-branched trichomes, base broadly cuneate, apex acute; wings narrowly elliptic, ca. 3 × 1 mm; keel ca. 6 × 1.5 mm. Stamens 5–5.5 mm; anthers ellipsoid, glabrous. Ovary hairy. Legume cylindrical, 1.5–3 cm × 2–3 mm, with dense appressed medifixed trichomes; endocarp purplish red blotched. Seeds 6–11 per legume. Fl. Aug, fr. Oct–Nov. $2n = 16$.

Sandy places on slopes or trailsides; 600–1800 m. Hainan [Cambodia, India, Laos, Myanmar, Sri Lanka, Thailand, Vietnam].

60. *Indigofera delavayi* Franchet, Pl. Delavay. 154. 1889.

滇木藍 dian mu lan

Indigofera daochengensis Y. Y. Fang & C. Z. Zheng.

Shrubs to 2 m tall. Stems pinkish brown, angular when young, with very sparse appressed medifixed symmetrically 2-branched trichomes, glabrescent. Stipules subulate, 5–7 mm, persistent, base thickened. Leaves 8–18 cm, (13 or)15–19-foliolate; petiole 3–4 cm; rachis terete, flattened, or adaxially grooved, glabrous; stipels subulate, 1–1.5 mm; petiolules ca. 2 mm, with dense appressed medifixed trichomes; leaflet blades opposite, oblong to slightly obovate, 1.3–3 × 0.8–1.3 cm, papery, abaxially with sparse appressed short medifixed trichomes, adaxially glabrous or subglabrous, midvein abaxially prominent and adaxially impressed, secondary veins 6 or 7 on each side of midvein, base broadly cuneate to rounded, apex rounded, truncate, or emarginate and mucronate. Racemes ca. 20 cm, laxly flowered; peduncle and rachis with sparse appressed medifixed trichomes; peduncle 1.5–2.5 cm; rachis angular; bracts linear, ca. 5 mm. Pedicel ca. 1.5 mm, deflexed in fruit. Calyx ca. 3 mm, with appressed minute trichomes; teeth triangular, apex acuminate. Corolla white or pink; standard broadly elliptic, 1.2–1.5(–1.8) cm, outside with sparse appressed minute soft trichomes, base shortly clawed, apex obtuse; wings 1.1–1.2 cm, base clawed and auriculate, margin ciliate; keel 1.3–1.4 cm, outside apically hairy, margin ciliate. Stamens 1.3–1.7 cm; anthers ellipsoid, ca. 1.5 mm, both ends hairy. Ovary glabrous, with 14 or 15 ovules; stigma with white trichomes. Legume linear, cylindric, 4–5(–6) cm, glabrous, curved upward at apex, sutures thickened. Fl. Jul–Sep, fr. Aug–Sep.

• Grasslands, scrub, forests, riverbanks; 1400–3400 m. SW Sichuan, N Yunnan.

61. *Indigofera pendula* Franchet, Pl. Delavay. 156. 1889.

垂序木藍 chui xu mu lan

Indigofera pendula var. *angustifolia* Y. Y. Fang & C. Z. Zheng; *I. pendula* var. *macrophylla* Y. Y. Fang & C. Z. Zheng; *I. pendula* var. *pubescens* Y. Y. Fang & C. Z. Zheng; *I. pendula* f. *umbrosa* Craib; *I. pendula* var. *umbrosa* (Craib) Y. Y. Fang & C. Z. Zheng.

Shrubs, 2–3(–4) m tall, often scandent. Stems dark brown, terete, with obvious lenticels; young branches light brown, angular, with appressed brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules lanceolate, 2–3 mm, caducous. Leaves 10–20 cm, (11 or)13–23(–27)-foliolate; petiole and rachis with appressed medifixed trichomes; petiole 1–5(–6) cm; rachis adaxially grooved; stipels subulate, 0.5–1 mm, persistent; petiolules 1.5–2 mm, hairy; leaflet blades opposite, elliptic to oblong but terminal one obovate, 1–2.5(–3.5) × 0.5–1.5 cm, papery, abaxially with sparse appressed white medifixed trichomes, adaxially glabrous, midvein adaxially impressed, secondary veins 6 on each side of midvein and obvious, base cuneate, broadly cuneate, or rounded, apex obtuse

to emarginate. Racemes 30–35 cm, drooping; peduncle 1–2 cm, with appressed medifixed trichomes; bracts lanceolate, ca. 3 mm. Pedicel 2–3 mm. Calyx cup-shaped, 2.5–3 mm, outside with appressed medifixed trichomes; tube ca. 1.5 mm; teeth ovate to lanceolate, mostly shorter than tube. Corolla pink; standard oblong, 9–11 × ca. 5 mm, bluish pink, outside densely white strigillose-puberulent, base shortly clawed; wings ca. 1 cm, base auriculate and shortly clawed, margin ciliate; keel as long as wings, outside apically hairy, margin ciliate, spurs ca. 1.5 mm. Stamens 8–9.5 mm; anthers broadly ovoid, base with a few trichomes. Ovary glabrous, with 9–12 ovules. Legume brown, cylindric, ca. 5 cm × 3–4 mm, with sparse appressed medifixed trichomes; endocarp blotched. Seeds 8–10 per legume, reddish brown, ellipsoid, ca. 3 × 2 mm. Fl. Jun–Aug, fr. Sep–Oct.

• Mountain slopes, valleys, riverbanks, scrub, forest margins; 1900–3300 m. SW Sichuan, NW and W Yunnan.

62. *Indigofera howellii* Craib & W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 207. 1920.

长序木藍 chang xu mu lan

Indigofera deginensis Sanjappa; *I. emarginata* Y. Y. Fang & C. Z. Zheng.

Shrubs, to 3 m tall. Stems brown, terete, with yellowish lenticels, with appressed medifixed symmetrically 2-branched trichomes. Stipules narrowly lanceolate, 2–3 mm, with appressed brown trichomes. Leaves 9–11 cm, (7 or)9–17(–23)-foliolate; petiole and rachis with sparse appressed white and some brown medifixed trichomes; petiole (0.5–)1–3(–4) cm; rachis terete, adaxially narrowly grooved; stipels minute; petiolules ca. 1 mm, with appressed medifixed trichomes; leaflet blades opposite, elliptic, 0.8–3(–3.5) × 0.3–1.5(–2) cm, thinly papery, both surfaces with appressed white medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins 4 or 5 on each side of midvein and adaxially obvious, base broadly cuneate, apex rounded to truncate and with a ca. 1 mm mucro. Racemes 10–20 cm, densely flowered; peduncle and rachis hairy; peduncle 1–2 cm; bracts ovate to ovate-lanceolate, 2–3 mm, caducous, abaxially with brown trichomes. Pedicel 2–3 mm. Calyx cup-shaped, (2–)3–4 mm, outside hairy; tube ca. 2 mm; teeth triangular to lanceolate, ca. 1–2 × as long as tube. Corolla purple; standard obovate to obovate-elliptic, 8–10.5 × 5–6 mm, outside with dense appressed white trichomes, base shortly clawed, apex obtuse; wings 8–10 × ca. 2.5 mm; keel 8–10.5 mm, outside apically hairy. Stamens (6.5–)7–8 mm; anthers ovoid, base with a few trichomes. Ovary glabrous. Fl. May–Sep, fr. unknown.

• Scrub, sparse forests on hill slopes; 800–3500 m. SW Sichuan, Xizang, W Yunnan.

Most material cultivated in England as *Indigofera potaninii* (here treated as a synonym of *I. szechuensis*) belongs instead to *I. howellii*.

63. *Indigofera sensitiva* Franchet, Pl. Delavay. 157. 1889.

敏感木藍 min gan mu lan

Shrubs, erect, 60–90 cm tall. Stems brown; young branches with sparse appressed medifixed symmetrically 2-branched

trichomes. Stipules lanceolate, ca. 5 mm, with appressed medifixed trichomes. Leaves ca. 15 cm, 21–31-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 1–2 cm; stipels subulate, ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, narrowly lanceolate, 1.2–2 × 0.2–0.7 cm, thickly papery, abaxially pale green and with sparse appressed medifixed trichomes or glabrescent, adaxially green and with sparse appressed medifixed trichomes or glabrescent with isolated hairs along midvein, midvein abaxially prominent and adaxially flat, secondary veins 4 or 5 on each side of midvein and abaxially obvious, base rounded, apex acute and mucronate. Racemes 3–4 cm, shorter than leaves, many flowered; peduncle shorter than petioles, hairy; bracts linear-lanceolate, 1.5–2 mm, caducous, abaxially with appressed medifixed trichomes. Pedicel ca. 1 mm, hairy, reflexed in fruit. Calyx ca. 2.5 mm, with appressed medifixed trichomes; teeth triangular, as long as tube. Corolla purplish blue; standard broadly elliptic, ca. 5 × 3.5 mm, outside with appressed trichomes; wings ca. 4.5 mm; keel ca. 4.5 mm, spurred at middle. Stamens 3–4 mm; anthers ovoid-globose, glabrous. Ovary glabrous, with 7 or 8 ovules. Legume linear, cylindrical, 2.5–3 cm, with sparse appressed medifixed trichomes; endocarp red blotched. Seeds 6 or 7 per legume, 2.5–3 × ca. 2 mm. Fl. Jun–Aug, fr. Sep–Nov.

- Grasslands, scrub, thickets; 1100–2400 m. NW Yunnan.

64. *Indigofera chaetodonta* Franchet, Pl. Delavay. 155. 1889.

刺齿木蓝 ci chi mu lan

Indigofera gracillima H. T. Tsai & T. T. Yu.

Subshrubs, 10–30 cm tall. Stems spreading, many branched, base woody. Young branches, yellowish brown, slender, with sparse appressed white medifixed symmetrically 2-branched trichomes, glabrescent. Stipules linear, 1.5–3 mm. Leaves 0.6–1.5(–2) cm, (5 or) 7- or 9-foliolate; petiole and rachis with sparse appressed medifixed trichomes; petiole 0.2–5(–6) mm; stipels ca. 0.5 mm; petiolules ca. 1 mm; leaflet blades opposite, oblong to oblanceolate, 3.5–6 × 1.5–2.5 mm, papery, abaxially pale green and with sparse appressed medifixed trichomes, adaxially green and glabrous, midvein adaxially impressed, secondary veins not visible, base rounded, cuneate, or broadly cuneate, apex obtuse-rounded and mucronate. Racemes 2–5 cm, many flowered; peduncle 0.9–1.5 cm, sparsely hairy; rachis scattered with reddish pearl bodies; bracts linear, 1–1.5 mm, caducous, abaxially with appressed medifixed trichomes. Pedicel 0.5–1 mm, hairy, deflexed in fruit. Calyx 2–3 mm, outside with sparse appressed medifixed trichomes; tube 0.5–1 mm; teeth linear-lanceolate, 1.5–2 mm. Corolla red; standard broadly elliptic, 5–7 × ca. 4 mm, outside hairy; wings 5–7 × ca. 2 mm; keel 5–6.5 mm, spur ca. 0.5 mm. Stamens 4–5 mm; anthers globose, base hairy. Ovary hairy, with 7 or 8 ovules. Legume linear, cylindrical, 1.5–2 cm, glabrous or with sparse appressed medifixed trichomes; endocarp purple blotched. Seeds 6 or 7 per legume. Fl. Jun–Aug, fr. Aug–Oct.

- Grassy slopes, *Pinus* forests; 2300–2600 m. Yunnan.

65. *Indigofera mengtzeana* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 57. 1913.

蒙自木蓝 meng zi mu lan

Indigofera mairei Pampanini var. *micrantha* Pampanini; *I. vaniotii* H. Lévillé.

Shrubs, 0.5–2 m tall. Stems purplish brown, terete; young branches grayish brown, angular, with dense appressed white and brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules linear, ca. 3 mm. Leaves 3–9 cm, 11–21-foliolate; petiole and rachis adaxially depressed, with appressed medifixed trichomes; petiole 1.5–2 cm; stipels ca. 0.5 mm; petiolules ca. 1 mm; leaflet blades opposite, narrowly oblong, oblong, or elliptic-oblong, 5–13 × 3–6 mm, papery, abaxially pale green and with sparse appressed medifixed trichomes, adaxially green and glabrous, midvein adaxially impressed, secondary veins not visible, base rounded, cuneate, or broadly cuneate, apex obtuse-rounded and mucronate. Racemes 3–4 cm, shorter than leaves, many flowered; peduncle 3–8 mm, sparsely hairy; rachis with reddish brown glands; bracts linear, 1–1.5 mm, caducous, abaxially with appressed medifixed trichomes. Pedicel ca. 1 mm, hairy, deflexed in fruit. Calyx outside with sparse appressed medifixed trichomes; tube 1–1.5 mm; teeth triangular, 1–2 mm. Corolla purplish blue; standard broadly elliptic, ca. 6.5 × 4 mm, outside hairy; wings ca. 6.5 × 2 mm; keel ca. 6.5 mm, spur ca. 0.5 mm. Stamens 5–5.5 mm; anthers globose, base hairy. Ovary glabrous, with 7 or 8 ovules. Legume linear, cylindrical, ca. 2.5 cm, glabrous or with sparse appressed medifixed trichomes; endocarp purple blotched. Seeds 6 or 7 per legume, 2.5–3 × ca. 2 mm. Fl. May–Jun, fr. Jul–Oct.

- Grassland slopes in dry sunny valleys, trailsides in scrub; 1400–2100 m. SW Sichuan, Yunnan.

66. *Indigofera calcicola* Craib, Notes Roy. Bot. Gard. Edinburgh 9: 108. 1916.

灰岩木蓝 hui yan mu lan

Shrubs, 30–120 cm tall, many branched, all parts except for old stems with very dense appressed silvery medifixed 2-branched trichomes. Old stems grayish brown; lateral branches short. Stipules ovate, ca. 0.5 mm. Leaves 1–2.5 cm, 5–9-foliolate; petiole and rachis adaxially slightly grooved; petiole 3–7 mm; stipels ca. 0.1 mm, covered with silvery trichomes, usually not visible; petiolules ca. 0.5 mm; leaflet blades opposite, obcordate to obovate, 4–5 × 2.5–3 mm, midvein adaxially impressed, secondary veins not visible, base broadly cuneate to rounded, apex rounded to emarginate. Racemes 1–5 cm; peduncle 4–10 mm; bracts ca. 0.8 mm, caducous. Pedicel ca. 1 mm. Calyx ca. 2 mm; teeth ovate-oblong, as long as tube, margin ciliate. Corolla red; standard elliptic-oblong to ovate-oblong, ca. 7 mm, outside densely hairy; wings ca. 7 mm, outside hairy; keel ca. 7 mm. Stamens 5–6.5 mm; anthers ovoid, apex mucronate. Ovary hairy; style glabrous. Legume cylindrical, 1.5–2.5 cm, with dense appressed grayish white medifixed trichomes, apex mucronate; endocarp purplish red blotched. Fl. Jul, fr. Aug.

- Dry stony situations; 1800–2500 m. Yunnan.

The syntypes of this species, *G. Forrest 10350* (K) and *10505* (E), were collected from the Jinsha Jiang dry valley; the type of *Indigofera lenticellata*, *E. H. Wilson 3386* (K), was collected from the Min Jiang dry valley. The two valleys have the same dry climate, but the Jinsha

Jiang is hotter than Min Jiang. The two species may prove to be just one species and need to be further researched.

67. *Indigofera lenticellata* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 56. 1913.

岷谷木藍 min gu mu lan

Shrubs, erect, to 1.2 m tall. Stems purplish brown; branches terete, with rufous lenticels, with appressed white medifixed symmetrically 2-branched trichomes. Stipules triangular, ca. 1.5 mm. Leaves 1–3 cm, 5–9-foliolate; petiole and rachis with dense appressed white mixed brown medifixed trichomes; petiole 2–7 mm; stipels minute; petiolules ca. 0.5 mm; leaflet blades opposite, elliptic to obovate, 3–7 × 2–5 mm, both surfaces with white and brown appressed medifixed trichomes, abaxially with denser trichomes, secondary veins not visible, base rounded to broadly cuneate, apex rounded to truncate and mucronate. Racemes 2.5–4 cm; peduncle 3–10 mm, longer than petioles; bracts ovate, ca. 1.5 mm, caducous. Pedicel ca. 1 mm, reflexed in fruit. Calyx hairy; tube ca. 1 mm; teeth as long as tube. Corolla red; standard broadly elliptic, ca. 7 × 4–4.5 mm, outside hairy; wings and keel ca. 7 mm. Stamens 5–6.5 mm. Legume dark purple, cylindric, 1.2–3 cm, with sparse appressed medifixed trichomes. Fl. May–Jul, fr. Sep–Oct.

• Sunny slopes, valleys, thickets; 1500–3900 m. Sichuan, E Xizang, NW Yunnan.

See the note under the preceding species, *Indigofera calcicola*.

68. *Indigofera hancockii* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 53. 1913.

苍山木藍 cang shan mu lan

Indigofera forrestii Craib.

Shrubs, 0.5–1.8 m tall. Stems light brown, with sparse scattered lenticels; young branches with appressed white and brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules lanceolate, 1.5–2 mm. Leaves 6–9 cm, (5–)9–19-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 0.8–2 cm; stipels minute; petiolules ca. 1 mm; leaflet blades opposite, narrowly elliptic, 6–12(–18) × 4–6(–10) mm, both surfaces with sparse white and brown appressed medifixed trichomes, abaxially green, adaxially brown or black when dry, midvein abaxially prominent and adaxially impressed, secondary veins not visible, base broadly cuneate to rounded, apex rounded to truncate and mucronate. Racemes 6–12 cm, densely flowered; peduncle 4–15 mm; bracts ovate, ca. 1.5 mm, abaxially with appressed brown medifixed trichomes. Pedicel ca. 1.5 mm. Calyx 2–2.5 mm, with appressed brown medifixed trichomes; teeth triangular-lanceolate, as long as tube. Corolla red, 6–9 mm; standard elliptic, ca. 6.5 mm, outside with appressed medifixed trichomes; wings ca. 6.5 mm; keel ca. 4.5 mm, outside apically hairy. Stamens 6–7 mm; anthers broadly ovoid, glabrous, apex mucronate. Ovary hairy, with 9 ovules; style glabrous. Legume linear, cylindric, 3–4 cm, with sparse appressed medifixed trichomes; endocarp blotched. Fl. May–Aug, fr. Oct–Nov.

• Sunny slopes, near streams; 2400–2900 m. S Sichuan, Yunnan.

Indigofera hancockii is very closely related to *I. franchetii* and might be better treated as a variety of that species.

69. *Indigofera franchetii* X. F. Gao & Schrire, **nom. nov.**

灰色木藍 hui se mu lan

Replaced synonym: *Indigofera cinerascens* Franchet, Pl. Delavay. 153. 1889, not *Indigofera cinerascens* Candolle, Prodr. 2: 226. 1825, nor *Indigofera cinerascens* Ecklon & Zeyher, Enum. Pl. Afric. Austral. 2: 241. 1836.

Shrubs, to 1 m tall. Stems with dense appressed white medifixed symmetrically 2-branched trichomes. Stipules ca. 1 mm. Leaves ca. 9 cm, (11–)17–27-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 0.8–1.5 cm; stipels ca. 0.5 mm; petiolules ca. 1 mm; leaflet blades opposite, closely spaced, narrowly elliptic, elliptic, or obovate-elliptic, 5–9(–14) × 3–6 mm, both surfaces with appressed white medifixed trichomes, adaxially green, abaxially paler, midvein abaxially prominent and adaxially impressed, base broadly cuneate to rounded, apex rounded to acute and mucronate. Racemes 5.5–11 cm; peduncle 0.7–3 cm, with appressed white mixed brown medifixed trichomes; bracts ovate, minute. Pedicel 0.5–1 mm. Calyx cup-shaped, ca. 3 mm, with appressed grayish trichomes; teeth ca. 1–2 × as long as tube. Corolla purplish red; standard oblong-elliptic, 7–8 mm, outside with appressed medifixed trichomes; wing margin ciliate; keel margin ciliate, apex mucronate. Stamens 6–6.5 mm; anthers ovoid, glabrous. Ovary hairy; style glabrous. Legume linear, cylindric, 3–4 cm, with appressed white trichomes. Fl. Jun–Sep, fr. Oct.

• Scrub on sunny slopes, grasslands, trailsides; 600–1800 m. SW Sichuan, Yunnan.

70. *Indigofera heterantha* Wallich ex Brandis in Brandis & Stewart, Forest Fl. N.W. India, 135. 1874.

异花木藍 yi hua mu lan

Indigofera gerardiana Wallich ex Baker; *I. gerardiana* var. *heterantha* (Wallich ex Brandis) Baker; *I. heterantha* var. *gerardiana* (Wallich ex Baker) Ali.

Shrubs, 1–2(–3) m tall. Stems grayish brown, terete, with rounded lenticels, covered with appressed medifixed trichomes; young branches angular, with slightly spreading white medifixed symmetrically 2-branched trichomes. Stipules linear, ca. 3 mm, caducous, with appressed brown trichomes. Leaves 6–7 cm, (9–)13–25-foliolate; petiole and rachis adaxially grooved, with appressed medifixed trichomes; petiole 1–9 mm; stipels subulate, ca. 1 mm; petiolules ca. 1 mm; leaflet blades opposite, elliptic, obovate, or oblanceolate, 5–15(–25) × 2–10(–15) mm, papery, both surfaces with appressed white medifixed trichomes, midvein abaxially prominent and adaxially flat, secondary veins not visible, base broadly cuneate to rounded, apex obtuse to truncate and mucronate. Racemes 3–8 cm; peduncle (0.5–)1.4–2(–3) cm; young inflorescences in bud grayish green with few brownish hairs, rachis with dense appressed medifixed trichomes; bracts minute, caducous. Pedicel 1.5–3 mm, hairy, deflexed in fruit. Calyx 2.5–3.5(–4) mm, with appressed medifixed trichomes; tube ca. 1.5 mm; teeth triangular-lanceolate,

1.5–2.5 mm. Corolla purple to light purple; standard elliptic, 7.5–9(–13) × 4–5 mm, outside hairy; wings 7.5–10 mm, margin ciliate; keel 0.7–1.3 cm, outside apically hairy, margin ciliate, spur ca. 1 mm. Stamens (6–)7–11.5 mm; anthers ovoid-globose, base hairy. Ovary hairy, with 10 ovules. Legume brown, linear, cylindrical, 1–1.5(–2) cm, glabrescent; endocarp purple blotched. Seeds 6–10 per legume, oblong, ca. 2.5 mm. Fl. May–Jun, fr. Jul–Oct. $2n = 16, 32, 48$.

Forested slopes; ca. 2300 m. S Xizang [Afghanistan, Bhutan, India, Nepal, Pakistan, Sri Lanka; Africa].

71. *Indigofera chenii* S. S. Chien, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 9: 150. 1934.

南京木藍 nan jing mu lan

Shrubs, erect, to 1 m tall. Stems brown, terete; branches with appressed white medifixed symmetrically 2-branched trichomes. Stipules bristlelike, ca. 2 mm. Leaves 5–7 cm, 11–19-foliolate; petiole and rachis adaxially grooved, with appressed white medifixed trichomes; petiole 4–6 mm; stipels bristlelike, ca. 0.5 mm; petiolules ca. 1 mm; leaflet blades opposite, oblong, 8–12 × 4–5 mm, rigidly papery, both surfaces with appressed medifixed trichomes, midvein abaxially prominent and adaxially impressed, secondary veins not visible, base rounded to cuneate, apex obtuse to truncate and mucronate. Racemes ca. 8.5 cm; peduncle 1.4–2 cm; bracts bristlelike, ca. 1 mm, caducous. Pedicel 1–2 mm, with spreading white trichomes. Calyx 2–3 mm; teeth shorter than or as long as tube. Corolla red; standard oblong, 10–11 × 6–7 mm, outside hairy, base cuneate, apex truncate; wings oblong-spatulate, margin ciliate; keel cuneate, apex ciliate. Stamens 8–9 mm; anthers ovoid, glabrous, apex mucronate. Ovary sparsely hairy, with 5–7 ovules. Fl. Sep, fr. unknown.

• Foothills, Jiangsu (Nanjing).

On the basis of available material, no characters or character combinations appear to distinguish *Indigofera chenii* from *I. heterantha*. The widely separate distributions of Xizang and Yunnan provinces for *I. heterantha* and near Nanjing in Jiangsu province for *I. chenii*, however, indicate that more research is needed to establish the status of this species.

72. *Indigofera mairei* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 16. 1910.

西南木藍 xi nan mu lan

Indigofera mairei var. *intermedia* Pampanini; *I. monbeigii* Craib.

Shrubs, 1–2(–3) m tall. Stems chestnut-brown, terete or angular, with yellowish round lenticels; young branches with appressed white or brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules subulate, 3–5(–6) mm. Leaves 2.5–10 cm, 5–13(–17)-foliolate; petiole and rachis with appressed brown mixed white medifixed trichomes; petiole 0.7–1.5(–2) cm; rachis adaxially grooved; stipels subulate, 0.5–1 mm; petiolules 1–2 mm; leaflet blades opposite, elliptic to elliptic-oblong, (0.5–)1–3(–3.5) × (0.3–)0.6–1.8(–2) cm, papery, both surfaces with lightly appressed white medifixed trichomes, midvein adaxially obviously depressed, secondary veins not

visible, base cuneate to broadly cuneate, apex obtuse to emarginate and mucronate. Racemes 2–6(–8) cm; peduncle and rachis with appressed white and brown medifixed trichomes; peduncle 1–10 mm; bracts narrowly lanceolate, 2–3 mm, persistent or caducous, hairy. Pedicel 1–2 mm, hairy, deflexed in fruit. Calyx 2.5–3 mm; teeth shorter than to as long as tube. Corolla pinkish purple; standard elliptic, 7–9(–10) × 5–6 mm, sessile, outside with appressed white medifixed trichomes; wings 7–9(–10) mm, margin ciliate; keel 7–9(–10) mm, outside hairy, spur minute. Stamens 6–8 mm; anthers ovoid, base with a few trichomes. Ovary hairy on sutures and at apex, with 6–8 ovules. Legume brown, cylindrical, 2–3.5 cm, glabrescent; endocarp blotched. Seeds 6 or 7 per legume, cubic. Fl. May–Jun, fr. Jul–Aug.

• Slopes in scrub or thickets; 2100–2700 m. S Gansu, Guizhou, N and W Sichuan, SE Xizang, N Yunnan.

73. *Indigofera rigioclada* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 60. 1913.

硬叶木藍 ying ye mu lan

Shrubs, to 1 m tall. Stems dark brown when dry, terete; young branches with appressed medifixed symmetrically 2-branched trichomes, glabrescent. Stipules rigid, ca. 1 mm. Leaves 1.5–2.5 cm, 5–13-foliolate; petiole and rachis adaxially grooved, with appressed white and brown medifixed trichomes; petiole 4–10 mm; stipels minute, hairy; petiolules ca. 1 mm; leaflet blades opposite, oblong to obovate-oblong, 3–10(–15) × 2–5 mm, both surfaces with appressed medifixed trichomes, midvein adaxially impressed, secondary veins not visible, base broadly cuneate, apex rounded and mucronate. Racemes 3–6(–8) cm, densely flowered; peduncle 1–5(–10) mm or nearly absent, hairy, reflexed in fruit; bracts ovate, ca. 2 mm, caducous. Pedicel 1–2 mm, with appressed medifixed trichomes. Calyx with appressed medifixed trichomes; tube ca. 1.5 mm; teeth triangular, ca. 1.5 mm. Corolla pink to rose; standard elliptic, 8–10 × 4.5–7.5 mm, outside hairy; wings 8–10 × ca. 2 mm; keel 7.5–10 × 2.5–3 mm. Stamens 7–9 mm; anthers ovoid, glabrous. Ovary hairy, with 8–10 ovules. Legume cylindrical, ca. 2 cm, hairy. Fl. Apr–Jul, fr. Jul–Sep.

• Trailsides, *Pinus* forests, slopes; 2400–3300 m. W Sichuan, SE Xizang, NW Yunnan.

74. *Indigofera wilsonii* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 63. 1913.

大花木藍 da hua mu lan

Shrubs, 30–80 cm tall, with ascending branches. Stems terete, with brown lenticels; young branches with sparse appressed medifixed 2-branched trichomes, glabrescent. Stipules linear-subulate, 5–6(–7) mm. Leaves 2.5–5 cm, 9–13-foliolate; petiole and rachis hairy; petiole 5–11(–13) mm; rachis adaxially grooved; stipels subulate, ca. 0.5 mm; petiolules ca. 1 mm, hairy; leaflet blades opposite, elliptic to obovate, 6–16 × 4–10 mm, papery, both surfaces with appressed white medifixed trichomes, midvein adaxially impressed, base rounded, apex obtuse. Racemes 5–10(–15) cm, laxly flowered; peduncle 1.5–4 cm, hairy; bracts linear, ca. 3 mm. Pedicel 2.5–4 mm. Calyx outside hairy; tube 2–2.5 mm; teeth lanceolate, ca. 3 mm. Co-

rolla standard obovate, 11–14 × 6–8 mm, outside white hairy; wings 11–14.5 × 3–3.5 mm, margin ciliate; keel 11–15 × 4.5–6 mm. Stamens 1–1.3 cm; anthers ovoid, glabrous. Ovary hairy. Fl. May–Jun, fr. unknown.

• Mountain forests; 1300–2000 m. W Sichuan (Pingwu, Wenchuan).

75. *Indigofera szechuensis* Craib, Notes Roy. Bot. Gard. Edinburgh 8: 62. 1913.

四川木藍 si chuan mu lan

Indigofera potaninii Craib.

Shrubs, 0.8–2.5 m tall. Stems rufous to blackish brown, terete, with sparse scattered yellow lenticels; young branches angular, with dense appressed mixed white and brown medifixed symmetrically 2-branched trichomes, glabrescent. Stipules lanceolate, 2.5–4 mm, stiff. Leaves 4–10 cm, (5 or)7–13-foliolate; petiole and rachis adaxially flat, with appressed white medifixed trichomes; petiole 0.5–1.5(–2.5) cm; stipels ca. 0.5 mm; petiolules ca. 1 mm; leaflet blades opposite, elliptic, obovate, oblong, or obovate-oblong, 5–20(–30) × 4–9(–10) mm, papery, both surfaces with dense appressed white medifixed trichomes, abaxially pale green, adaxially green, midvein adaxially flat or slightly depressed, secondary veins not visible on both surfaces, base rounded to cuneate, apex rounded, truncate, or acute and mucronate. Racemes 10–19 cm; peduncle 0.8–5 cm, hairy; bracts ovate to linear-lanceolate, 1.5–3 mm, caducous, with appressed medifixed trichomes. Pedicel 1.5–2 mm, hairy. Calyx 2–3.5 mm, with appressed brown medifixed trichomes; tube 1–1.5 mm; teeth triangular, 1–2 mm. Corolla crimson-red; standard broadly ovate-elliptic to obovate-elliptic, 7.5–9.5 × 5–6.5 mm, outside with appressed medifixed trichomes; wings 7.5–9.5 × ca. 2.5 mm, base clawed, margin ciliate; keel 7.5–9.5 mm, outside apically hairy, margin ciliate. Stamens 7.5–8.5 mm; anthers ovoid-globose, glabrous. Ovary hairy, with 8–10 ovules. Legume linear, cylindric, spreading or drooping, 3.5–4 cm, with sparse appressed medifixed trichomes when young, glabrescent. Seeds 8 or 9 per legume, 2.5–3 × ca. 2 mm. Fl. May–Jun, fr. Jul–Oct.

• Slopes, trailsides, riverbanks; 2500–3800 m. W Gansu, Sichuan, E Xizang, NW Yunnan.

Indigofera potaninii differs from *I. szechuensis* only by the size of the leaves and inflorescences, which change very substantially as the plant grows from early spring through late summer. Most material cultivated in England as *I. potaninii* is not this species but *I. howellii* (see comment under that species, p. 159). The epithet is sometimes given as "*szechuanensis*," but this is not correct.

76. *Indigofera pseudoheterantha* X. F. Gao & Schrire, Novon 19: 163. 2009.

拟多花木藍 ni duo hua mu lan

Shrubs, 0.2–3 m tall. Stems ribbed, strigose with equally 2-branched appressed minute white and scattered brown trichomes. Stipules triangular, ca. 1 mm. Leaves 1.5–3 cm, (5 or)7–11(or 13)-foliolate; petiole and rachis with appressed white trichomes; petiole 4–7 mm; stipels absent; leaflet blades elliptic to oblong, 4–9 × 2–4 mm, both surfaces with appressed equally 2-branched white trichomes but these adaxially sparser,

secondary veins not visible, base cuneate to rounded, apex rounded to obtuse. Racemes 1–4 cm, laxly 1–25-flowered; peduncle ca. 1 cm; bracts 1–1.5 mm, subulate. Flowers 1.2–1.3 cm. Pedicel 2–4 mm. Calyx ca. 2 mm; teeth lanceolate to triangular, ± to 2 × as long as tube. Corolla greenish yellow and rose to purple; standard outside strigose with appressed white trichomes; wings ciliate at margin; keel with appressed trichomes at apex. Stamens 1.1–1.2 cm; anthers ovoid, glabrous, apex mucronate. Style 4–5 mm. Legume 2.5–3 cm when young, with minute appressed trichomes. Fl. Jul–Aug, fr. Aug–Sep.

• Sunny and dry scrub, grasslands; 2700–2900 m. SW Sichuan, NW Yunnan.

77. *Indigofera acutipetala* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 325. 1983.

尖瓣木藍 jian ban mu lan

Shrubs, to 1.3 m tall. Stems dark brown when dry, terete, 4-ribbed, with small white lenticels, with appressed sparse white medifixed symmetrically 2-branched trichomes. Stipules linear, ca. 2 mm. Leaves ca. 3 cm, 5–11-foliolate; petiole 2–6 mm; stipels not visible; petiolules short; leaflet blades opposite, obovate to obovate-oblong, 3–7 × 2–4 mm, both surfaces with dense appressed white and brown medifixed trichomes but abaxially denser, secondary veins not visible, base cuneate to broadly cuneate, apex rounded and mucronate. Racemes 5–9 cm, densely flowered; peduncle 2–3 cm, longer than petioles, with some glands. Pedicel ca. 1 mm. Calyx with appressed white medifixed trichomes; tube ca. 1 mm; teeth lanceolate, ca. 1.5 mm. Corolla dark purple; standard 7–7.5 × ca. 4 mm, outside hairy, apical mucro ca. 1 mm; wings ca. 6 × 2 mm; keel ca. 6.5 mm. Stamens 5–6.5 mm; anthers ovoid, apex with a ca. 0.3 mm mucro. Ovary glabrous. Fl. Jul, fr. unknown.

• Moist slopes; ca. 2400 m. Sichuan (Jiulong).

This is a doubtful species.

78. *Indigofera jindongensis* Y. Y. Fang & C. Z. Zheng, Acta Phytotax. Sin. 21: 331. 1983.

景东木藍 jing dong mu lan

Shrubs, 60–100 cm tall. Stems 4-ribbed, with sparse scattered white lenticels, with appressed medifixed symmetrically 2-branched trichomes. Stipules lanceolate, ca. 3 mm, with appressed trichomes. Leaves 8.5–10.5 cm, 9–13-foliolate; petiole 1.2–1.7 cm, adaxially flattened; stipels minute; petiolules 1–1.5 mm; leaflet blades opposite, oblong to ovate-oblong, 1.5–3.2 × 0.9–1.4 cm, papery, both surfaces with appressed white medifixed trichomes, secondary veins 6–8 on each side of midvein, base ± rounded, apex obtuse and mucronate. Racemes 4–7 cm in fruit; peduncle 6–12 mm. Flowers not seen. Fruiting pedicel 2–4 mm. Legume cylindric, 3.5–4.5 cm, with sparse appressed trichomes. Seeds ca. 8 per legume, oblong, ca. 3 mm. Fl. unknown, fr. Dec.

• Mixed forests; ca. 1300 m. Yunnan (Jingdong).

79. *Indigofera neosericeopetala* P. C. Li, Acta Bot. Yunnan. 11: 285. 1989.

绢毛木藍 juan mao mu lan

Shrubs. Stems angular; young branches with appressed white medifixed trichomes, glabrescent. Stipules brown, lanceolate, ca. 2 mm, sparsely pubescent. Leaves ca. 2 cm, 3-foliolate; petiole 1–1.2 cm, sparsely pubescent; leaflet blades oblong, ca. 11 × 6 mm, both surfaces with dense appressed white medifixed trichomes, base cuneate, apex rounded and prominently mucronate. Racemes 5–6 cm; peduncle 4–5 mm, sparsely pubescent; bracts to 1 mm, deciduous. Pedicel ca. 0.8 mm. Calyx ca. 2 mm, pubescent; tube ca. 1 mm; teeth triangular, ca.

1 mm. Corolla purple; standard broadly oblong, ca. 7.5 × 5 mm, base broadly cuneate, apex slightly emarginate; wings 7–7.5 × ca. 2 mm; keel 7.5–8 × ca. 2 mm. Stamens 6.5–7.5 mm. Ovary densely pubescent. Fl. Jun, fr. unknown.

- *Quercus* forests; ca. 2000 m. Yunnan (Yongsheng).

No material of *Indigofera neosericeopetala* has been seen. The description is taken from the protologue. We could not locate the type, *Exped. Qinghai-Xizang 655* (PE). This species needs further research.

64. CYAMOPSIS Candolle, Prodr. 2: 215. 1825.

瓜儿豆属 *gua er dou shu*

Sun Hang (孙航); Brian D. Schrire

Cordaea Sprengel.

Herbs, annual, with appressed medifixed (T-shaped) trichomes. Stipules subulate or linear. Leaves 3-foliolate [or simple or imparipinnate]; leaflet blades on both surfaces or only abaxially with appressed white medifixed trichomes, margin serrate [or entire or parted]. Inflorescence axillary, racemose; peduncle present or absent. Calyx 5-toothed, most abaxial one longest. Corolla yellowish, yellow, or pink; keel not curled, ± bursiform, spur short or absent. Stamens 10, monadelphous; filaments connate into a tube, base not squamate; anthers with rigid point at apex. Ovary sessile. Legume nearly 4-angled, flattened, apex tapered to a beak. Seeds cubic or nearly so, surface slightly tubercular bulged.

Four species: tropical Africa and S Asia; one species (introduced) in China.

1. *Cyamopsis tetragonoloba* (Linnaeus) Taubert in Engler & Prantl, Nat. Pflanzenfam. 3(3): 259. 1894 [*“tetragonolobus”*].

瓜儿豆 *gua er dou*

Psoralea tetragonoloba Linnaeus, Mant. Pl. 1: 104. 1767; *Cyamopsis psoraloides* Candolle, nom. illeg. superfl.

Herbs, 0.6–1.3 m tall. Stems erect, branched, almost glabrous, base woody; branches conspicuously 4-angled. Stipules linear, 5–8(–10) mm. Leaves 3-foliolate; petiole 0.8–4 cm; leaflet blades ovate to subrhombic, 3–7 × 1.5–4 cm, abaxially with appressed grayish medifixed trichomes, adaxially sparsely appressed hairy or almost glabrous, base cuneate to broadly

cuneate, margin dentate to crenate, apex obtuse to acute. Racemes 4–10 cm, 6–30-flowered; peduncle 3–5 mm. Calyx 3–4.5 mm, outside hairy; teeth triangular, 2–2.5 mm, but most abaxial one longer than calyx tube. Corolla pink, 4–5.5 mm; standard broadly ovate, claw short, apex obtuse; keel pocketed at side, spur absent. Stamens 2.5–4.5 mm. Ovary glabrous. Legume nearly linear, 4–7 cm × 3–8 mm, erect, longitudinally ridged, with septa between seeds. Seeds 6–12 per legume, black to grayish, surface tuberculate. $2n = 14, 16$.

Cultivated in W Yunnan [probably native to NW India].

This species is cultivated for the gum from its seeds (guar gum), which is used as a stabilizer in processed food.