

56. SALVIA Linnaeus, Sp. Pl. 1: 23. 1753.

鼠尾草属 shu wei cao shu

Herbs, subshrubs, or shrubs. Leaves simple or pinnately compound. Verticillasters 2- to many flowered, in racemes, panicles, or spikes, rarely solitary, axillary; bracteoles minute. Calyx tubular to campanulate, hairy or glabrous on throat inside, 2-lipped; upper lip entire, 2-toothed, or 3-mucronate; lower lip 2-toothed. Corolla 2-lipped; tube straight, horizontal, curved upward or adaxially dilated, with or without hairy annulus inside; upper lip folded, straight or falcate, apex entire or emarginate; lower lip spreading, 3-lobed; middle lobe widest, margin entire, apex emarginate, fringed, or 2-lobulate; lateral lobes oblong or circular, spreading or reflexed. Stamens 2; filaments short, horizontal or erect; connectives prolonged, linear, T-shaped; upper arms with fertile elliptic or linear anther cells; lower arms robust or slender, with fertile or sterile anther cells, separated or connected to each other; staminodes 2, small or absent. Style 2-cleft, lobes subulate, linear or circular, equal, anterior lobe larger or posterior lobe indistinct. Disc slightly swollen in front or ringlike. Nutlets triquetrous, ovoid or oblong, glabrous, smooth.

About 900(–1100) species: tropical and temperate zones of the Old and New World, 84 species in China.

There are many taxonomic problems in the flora area, especially in Sichuan and Yunnan provinces; collation with the situation in the Himalaya is much needed.

- 1a. Connectives ± curved, semicircular or arcuate; upper arms longer than or equal to lower arms; anther cells on ends of upper and lower arms fertile.
 - 2a. Cultivated small shrubs or shrubby herbs; upper calyx lip conspicuously 3-toothed 45. *S. officinalis*
 - 2b. Herbs; upper calyx lip entire or very approximately 3-tipped; lower anther cells united.
 - 3a. Annual or biennial; stem much branched; leaves nearly all on stem.
 - 4a. Corolla 1–1.3(–1.6) cm, yellow 44. *S. roborowskii*
 - 4b. Corolla more than 2 cm.
 - 5a. Corolla yellow; leaves triangular-hastate to sagittate, basal lobes horizontally prolonged, triangular 42. *S. tricuspis*
 - 5b. Corolla blue-purple or purple; leaves triangular to ovate-triangular, basal lobes scarcely prolonged 43. *S. umbratica*
 - 3b. Perennial herbs; stem unbranched; leaves nearly all basal.
 - 6a. Filaments longer than connectives.
 - 7a. Calyx 2-lipped to 1/2 its length 18. *S. schizocalyx*
 - 7b. Calyx 2-lipped 1/4–1/3 its length, rarely to 1/2 after anthesis.
 - 8a. Filaments more than 3× as long as connectives, connectives 1.8–2.7(–6) mm.
 - 9a. Petiole narrowly long winged; lower surface of blades densely gray tomentose 15. *S. alatipetiolata*
 - 9b. Petiole not winged, rarely dilated into wing or sheath.
 - 10a. Adaxial corolla lip 2-lobed to its base; lobes ovate, apex subacute 23. *S. schizochila*
 - 10b. Apex of upper corolla lip emarginate, not 2-lobed to base.
 - 11a. Corolla 1.2–1.8 cm, upper lip densely villous or white bearded.
 - 12a. Leaf base cordate or subhastate, basal lobes mostly circular; corolla violet or purple, upper lip densely white bearded outside 21. *S. mairei*
 - 12b. Leaf base cordate or hastate, basal lobes acute; corolla blue-purple, upper lip densely villous outside 22. *S. pogonochila*
 - 11b. Corolla mostly more than 2 cm, upper lip pilose or subglabrous outside.
 - 13a. Stems and petioles retrorse pilose; leaves shallowly cordate or hastate, basal lobes acute sometimes rounded, apex acute or short acuminate; bracts broadly ovate 19. *S. brachyloma*
 - 13b. Stems and petioles densely spreading pilose, brown pilose or glabrescent; leaves cordate or subtruncate, rarely shallow hastate at base; bracts ovate or oblong-elliptic.
 - 14a. Leaves elliptic-ovate, base subtruncate or shallow cordate; corolla 1.7–1.9 cm 20. *S. lankongensis*
 - 14b. Leaves ovate or triangular-ovate, strongly emarginate or cordate rarely shallow hastate at base; corolla 2.6–3.5 cm 16. *S. evansiana*
 - 8b. Filaments to ca. 2× as long as connectives, mostly more than 3 mm (except *S. sonchifolia*).
 - 15a. Abaxial surface of leaves densely white or brown tomentose.
 - 16a. Corolla double zigzag; tube narrowly cylindrical, zigzag basally; exerted portion abruptly dilated, curved upward, purple-brown, chestnut brown, or dark purple; leaves elliptic-lanceolate or oblong-ovate, base rounded to subcordate 33. *S. castanea*
 - 16b. Corolla spreading, not curved upward.
 - 17a. Leaves oblong-elliptic, base rounded or shallow cordate; corolla yellow 5. *S. digitaloides*
 - 17b. Leaves triangular-hastate or elliptic-hastate, rarely cordate-ovate, sometimes with rounded lateral lobes, base cordate or hastate; corolla purple-red to red-brown 6. *S. przewalskii*

- 15b. Abaxial surface of leaves not tomentose.
- 18a. Corolla straight, 4–5 cm, rarely shorter.
- 19a. Calyx 1.7–2.2 cm, upper lip shorter than lower lip; leaves cordate-ovate to hastate-ovate, irregularly mucronate crenate-dentate 3. *S. dolichantha*
- 19b. Calyx 0.8–1.9 cm; leaves ovate to oblong-hastate, rarely crenate.
- 20a. Corolla yellowish; upper leaf surface finely strigose, pilose, lower surface obscurely glandular 2. *S. potaninii*
- 20b. Corolla red, violet, blue and white, or purplish on upper lip; upper leaf surface with hairs of 1 kind only, lower leaf surface conspicuously glandular.
- 21a. Leaves 3.5–9.5 cm, oblong-hastate or ovate-cordate, apex obtuse; calyx 1.6–1.5 cm 1. *S. prattii*
- 21b. Leaves 7–16 cm, subhastate, apex acute; calyx 1.2–1.5 cm 4. *S. wardii*
- 18b. Corolla straight or curved upward, less than 3.6 cm, rarely to 4 cm.
- 22a. Corolla straight; upper leaf surface subglabrous or pilose.
- 23a. Leaves oblong, subglabrous or puberulent on veins, undulate or obscurely crenate; corolla long tubular 41. *S. sonchifolia*
- 23b. Leaves ovate or triangular-ovate, with long hairs.
- 24a. Leaves ovate or triangular-ovate, pilose; stem spreading pilose 7. *S. brevilabra*
- 24b. Leaves triangular-ovate, adaxially sparsely ± appressed strigose, lower floccose-villous mainly along veins; stem slender, ascending, floccose-villous 11. *S. paohsingensis*
- 22b. Corolla ± curved upward.
- 25a. Leaves elliptic, elliptic-lanceolate, or oblong-ovate, rarely obovate or circular, base cuneate-attenuate to rounded or shallowly cordate, rarely subtruncate.
- 26a. Corolla orange, white, dark blue, or purple, tube straight but exerted part curved upward; leaf base rounded to cuneate, rarely shallowly cordate 8. *S. aerea*
- 26b. Corolla purple-brown, chestnut brown, or dark purple, tube double zigzag, narrowly tubular, zigzag basally but exerted part abruptly dilated and curved upward; leaf base rounded to subcordate 33. *S. castanea*
- 25b. Leaves ovate, broadly ovate, or circular, base cordate or subtruncate, rarely truncate.
- 27a. Bracts subcircular, broadly ovate, or ovate, apex rounded, acute or obtuse, adaxially glabrous; stem or floral leaves with spreading veins; petioles sometimes winged or sheathed; stem and leaves densely villous.
- 28a. Corolla white, yellowish, or cream-yellow, sometimes with few gray (except purplish or reddish in *S. cyclostegia* var. *purpurascens*), tube cylindric, dilated adaxially, curved upward 12. *S. cyclostegia*
- 28b. Corolla purplish or blue-purple, tube zigzag, tubular toward base, gradually dilated adaxially, curved at an angle above middle 38. *S. subpalmatinervis*
- 27b. Bracts ovate or rhombic-ovate, apex abruptly attenuate or short acuminate, adaxially subglabrous; leaves mostly basal, rarely on stem; blades strigose or pubescent, spreading pinnately veined; petioles villous, not winged; stem villous, base covered by brown scales 25. *S. sikkimensis*
- 6b. Filaments shorter than to as long as connectives.
- 29a. Abaxial leaf blade surface densely gray cobwebby-tomentose.
- 30a. Adaxial leaf blade surface densely pubescent, finely corrugate; calyx spreading villous outside; bracts adaxially slightly pubescent or subglabrous, abaxially densely villous 31. *S. atropurpurea*
- 30b. Adaxial leaf blade surface glabrous, not corrugate; calyx glandular pilose outside; bracts adaxially subglabrous or slightly pilose, abaxially cobwebby-villous 30. *S. heterochroa*
- 29b. Abaxial leaf blade surface not gray cobwebby-tomentose, with different hairs or subglabrous.
- 31a. Calyx with basal purple-black hairs outside 29. *S. smithii*
- 31b. Calyx without basal purple-black hairs outside.
- 32a. Corolla straight, not curved.
- 33a. Calyx 5–7 mm; verticillasters 2-flowered 17. *S. pauciflora*
- 33b. Calyx more than 7 mm; verticillasters few to many flowered.
- 34a. Calyx 2-lipped to 1/2 its length 36. *S. bifidocalyx*
- 34b. Calyx 2-lipped less than 1/2 its length.
- 35a. Stems and leaves densely brown pilose; corolla purple or white with purple spots, rarely yellow; leaves coarsely dentate-crenate; bracts ovate, apex acuminate to acute 9. *S. himmelbaurii*
- 35b. Stems and leaves glandular pilose to minutely hispid or subglabrous; corolla yellow, limb tinged purple or purple; leaves coarsely crenate-dentate; bracts lanceolate to ovate-lanceolate, apex long acuminate 10. *S. maximowicziana*
- 32b. Corolla ± curved downward.
- 36a. Calyx tubular to tubular-campanulate; leaf apex acuminate; corolla yellow.

- 37a. Abaxial surface of leaf green; calyx tubular, 1.7–2.1 cm; corolla tube hairy annulate inside 13. *S. cynica*
- 37b. Abaxial surface of leaf purple; calyx tubular-campanulate, 1–1.5 cm; corolla tube inside without an hairy annulus or obscurely pilose annulate (*S. omeiana* var. *grandibracteata*) 14. *S. omeiana*
- 36b. Calyx campanulate; leaf apex not acuminate, rarely apical tooth acute or broadly acuminate (e.g., *S. hupehensis*).
- 38a. Leaves broadly ovate to broadly cordate, subequal to equal in size; corolla slightly curved upward, not abruptly dilated adaxially or abaxially beyond calyx.
- 39a. Corolla purple, 3–4.5 cm; leaf apex rounded, or apical tooth acute or broadly acuminate 28. *S. hupehensis*
- 39b. Corolla yellow, less than 4 cm; leaf apex obtuse to acute.
- 40a. Calyx 1.7–2.2 cm, broadly tubular-campanulate, greenish 27. *S. hylocharis*
- 40b. Calyx 1–1.6 cm, campanulate.
- 41a. Leaves cordate to ovate-hastate, 4–18×3.5–13.5 cm, irregularly double incised-crenate, mostly on stem; corolla yellow 24. *S. campanulata*
- 41b. Leaves broadly ovate-triangular to subcircular, 8–19×4–19 cm, irregularly double crenate or dentate, mostly basal; corolla green-white, sometimes with violet spots 26. *S. handelii*
- 38b. Leaves ovate to oblong-ovate, wider than long; corolla mostly double zigzag, base narrowly cylindrical, abruptly dilated adaxially or abaxially beyond calyx.
- 42a. Verticillasters crowded in strobiloid inflorescences when young, covered by subcircular bracts; leaves ovate, 4–15×2–10 cm 37. *S. kiaometiensis*
- 42b. Verticillasters not crowded, not in strobiloid inflorescences when young; bracts not subcircular.
- 43a. Corolla dark purple, purple, to red.
- 44a. Calyx mouth subtruncate or obscurely 2-lipped; corolla red; leaves ovate, (5–)6–10.5×(3–)4–8 cm, ± membranous, densely tomentose-villous 34. *S. atrorubra*
- 44b. Calyx conspicuously 2-lipped; corolla purple-blue; leaves ovate to ovate-triangular, (2.5–)3.5–6(–9.2)×(1.5–)3–5(–6) cm, papery, finely pilose 32. *S. bulleyana*
- 43b. Corolla yellow.
- 45a. Petioles retrorse bristly-hirsute; upper corolla lip upright 40. *S. nipponica*
- 45b. Petioles not retrorse bristly hirsute; upper corolla lip spreading, not upright.
- 46a. Leaves ovate to oblong-ovate, rarely subcircular or elliptic, 3–9×2–8 cm, apex obtuse or rounded or acute, base cordate or shallowly hastate, adaxially appressed villous or appressed pubescent, abaxially spreading pilose on veins or densely villous when young 39. *S. mekongensis*
- 46b. Leaves ovate to triangular-ovate, 2–7×3.5–5 cm, apex acute or obtuse, base hastate, rarely cordate, adaxially strigose-pilose, abaxially pubescent along veins 35. *S. flava*
- 1b. Connectives ± straight, not curved, semicircular; anther cells of lower arms sterile.
- 47a. Abaxial arms of connectives united.
- 48a. Herbs annual or biennial, much branched; leaves simple; corolla 4–6 mm 64. *S. plebeia*
- 48b. Perennial herbs; unbranched or few branched; leaves simple or odd-pinnate compound; corolla longer.
- 49a. Apex of upper calyx lip conspicuously 3-toothed, teeth erect; corolla tube without hairy annulus inside 62. *S. grandifolia*
- 49b. Apex of upper calyx lip entire or 3-mucronate; corolla tube with hairy annulus or imperfect hairy annulus inside, rarely without.
- 50a. Leaves simple; bracts colored.
- 51a. Plants wild; corolla tube included 63. *S. deserta*
- 51b. Plants cultivated; corolla tube exerted.
- 52a. Herbs; leaves hairy, abaxially gray minutely tomentose; corolla campanulate-tubular, 2–2.3 cm, scarlet or blood red 66. *S. coccinea*
- 52b. Subshrubs; leaves glabrous; corolla tubular, 4–4.2 cm, red, purple, to white 65. *S. splendens*
- 50b. Leaves compound, mostly ternate or odd-pinnate, rarely simple; bracts green.
- 53a. Corolla straight, narrowly tubular, slightly longer to 2–3× longer than calyx.
- 54a. Calyx hirsute annulate on throat inside; plants densely white lanate 61. *S. nanchuanensis*
- 54b. Calyx without a hairy annulus inside; plants subglabrous, pubescent, or pilose.
- 55a. Corolla tube slightly longer than calyx; connectives ca. 0.3 mm 60. *S. brevicconnectivata*
- 55b. Corolla tube 2–3× longer than calyx; connectives 3–4 mm 59. *S. plectranthoides*
- 53b. Corolla tube curved, apex dilated.
- 56a. Middle lobe of lower corolla lip 2-lobulate; lobules irregularly crenate-denticulate apically, fringed, or fringed on 1 side.

- 57a. Middle lobe of lower corolla lip strongly 2-lobulate, Y-shaped; lobules obtriangular, repand-crenate, apex denticulate or fringed; calyx finely shiny-pilose beyond middle inside; anthers finely puberulent; connectives glandular pubescent at joints 58. *S. meiliensis*
- 57b. Middle lobe of lower corolla lip shallowly 2-lobulate, T-shaped; lobules subcircular, fringed on 1 side; calyx white villous annulate on throat inside; anthers and connectives glabrous 57. *S. honania*
- 56b. Middle lobe of lower corolla lip emarginate or 2-lobulate; lobules never fringed apically or on 1 side.
- 58a. Corolla less than 1.3 cm.
- 59a. Calyx tube hirsute annulate inside; stem and leaves white hirsute 54. *S. prionitis*
- 59b. Calyx tube without hairy annulus inside; stem and leaves glabrous or puberulent 55. *S. cavaleriei*
- 58b. Corolla more than 1.5 cm.
- 60a. Leaves simple, triangular-ovate; corolla 3–4 mm 56. *S. nubicola*
- 60b. Leaves pinnately compound, sometimes with simple.
- 61a. Corolla tube more than 3× longer than calyx, spreading or slightly curved upward; limb shorter than exerted part of corolla tube, upper lip erect; leaves ternate compound, leaflets short petiolulate 46. *S. trijuga*
- 61b. Corolla tube included or slightly exerted beyond calyx; limb longer than exerted part of corolla tube, upper lip falcate or galeate, upright, almost at a right angle to lower lip.
- 62a. Calyx without a hairy annulus inside; petioles and stem spreading white villous 47. *S. yunnanensis*
- 62b. Calyx white hirsute annulate within; petioles and stem villous or glabrescent.
- 63a. Corolla tube without a conspicuous hairy annulus inside.
- 64a. Leaves and stem retrorse pilose; leaf blade crenulate 52. *S. paramiltiorrhiza*
- 64b. Leaves and stem pubescent; leaf blade serrate 53. *S. vasta*
- 63b. Corolla tube with a conspicuous hairy annulus inside.
- 65a. Calyx tubular; corolla tube included or slightly exerted beyond calyx, upper lip slightly arcuate.
- 66a. Calyx base white lamellate inside 50. *S. dabieshanensis*
- 66b. Calyx not white lamellate inside 49. *S. bowleyana*
- 65b. Calyx campanulate; corolla tube exerted or curved upward, upper lip conspicuously arcuate.
- 67a. Root scarlet outside; leaflets ovate, elliptic, to broadly lanceolate, pilose, apex acute or obtuse; racemes simple; upper corolla lip 1.2–1.5 cm 48. *S. miltiorrhiza*
- 67b. Root purplish or gray-brown to blackish brown or dark brown outside; leaflets oblong-ovate, oblong-lanceolate, to lanceolate, subglabrous, apex acuminate to acute; racemes compound, sometimes simple; upper corolla lip 0.9–1.1 cm 51. *S. sinica*
- 47b. Abaxial arms of connectives separated.
- 68a. Calyx with a hairy annulus or imperfect hairy annulus on throat, rarely with 2 rows of hirsute hairs on middle of upper lip inside.
- 69a. Plants ca. 11 cm tall; leaves mostly basal, stem leaves 1 pair, leaflets less than 9 mm 75. *S. adoxoides*
- 69b. Plants more than 11 cm tall; leaflets larger.
- 70a. Calyx with 2 rows of hirsute hairs on middle of upper lip, otherwise apex finely strigose inside; lobes of lower corolla lip similar, subequal or middle lobe larger, circular 74. *S. chunganensis*
- 70b. Calyx throat hirsute inside; lobes of lower corolla lip dissimilar, middle lobe largest, apex emarginate.
- 71a. Leaves simple or 3-foliolate; leaf or leaflet blade ovate to ovate-elliptic, base rounded to cordate 73. *S. chinensis*
- 71b. Leaves 1–4-pinnately compound.
- 72a. Leaves 1- or 2-pinnately compound; terminal leaflet lanceolate or rhombic, apex acuminate to caudate-acuminate, base narrowly cuneate; inflorescence rachis glandular pilose or pilose 72. *S. japonica*
- 72b. Leaves 3- or 4-pinnately compound; leaflets narrow elliptic to linear-lanceolate or oblanceolate, apex obtuse to acuminate, base attenuate; inflorescence rachis gray puberulent or glandular pilose 76. *S. filicifolia*
- 68b. Calyx without a hairy annulus or hairy rows inside.
- 73a. Corolla tube without a hairy annulus inside.
- 74a. Stems prostrate or ascending; basal leaves simple, stem leaves ternate compound; apex of upper calyx lip truncate 70. *S. substolonifera*

- 74b. Stems erect; leaves simple or compound; upper calyx lip not truncate.
- 75a. Leaves simple, oblong, 6.5–7×3.2–3.7 cm 83. *S. weihaiensis*
- 75b. Leaves ternate compound or 3–5-foliolate.
- 76a. Stems spreading villous at base, glandular pilose at apex; mid stem leaves 5-foliolate, terminal leaflet 1.8×1.2 cm; bracts lanceolate; upper calyx lip acute 84. *S. piasezkii*
- 76b. Stems densely retrorse puberulent; all leaves 3-foliolate, terminal leaflet 3–4×1.5–2 cm; bracts linear; upper calyx lip 3-mucronate 82. *S. fragarioides*
- 73b. Corolla tube with a hairy annulus inside.
- 77a. Verticillasters secund; middle lobe of lower corolla lip entire or emarginate at apex, ligulate, narrowly elliptic, to oblong.
- 78a. Middle lobe of lower corolla lip ligulate, narrowly elliptic, much narrower than lateral lobes; leaves simple, oblong 67. *S. liguliloba*
- 78b. Middle lobe of lower corolla lip semicircular to oblong, apex emarginate, larger than lateral lobes; leaves simple, or ternate compound, simple leaves ovate-lanceolate; leaflets ovate to ovate-lanceolate 68. *S. chienii*
- 77b. Verticillasters not secund; middle lobe of lower corolla lip emarginate or 2-lobulate at apex, not ligulate.
- 79a. Connectives with a subulate lamellate appendage at junction with filament 77. *S. appendiculata*
- 79b. Connectives without appendage.
- 80a. Adaxial corolla lip curved outward or suberect; leaves 1–3-pinnately compound; lateral leaflets much smaller than terminal leaflet 81. *S. adiantifolia*
- 80b. Adaxial corolla lip erect, plane or folded.
- 81a. Leaves always simple.
- 82a. Style sparsely retrorse pubescent 79. *S. qimenensis*
- 82b. Style glabrous 78. *S. kiangsiensis*
- 81b. Leaves simple, ternate, or 1- or 2-pinnately compound.
- 83a. Leaves 1- or 2-pinnately compound, leaflets irregularly lobulate or coarsely dentate, less than 2.5 cm 80. *S. hayatae*
- 83b. Leaves simple or ternate compound.
- 84a. Stems sparsely retrorse puberulent or subglabrous; leaves cordate-ovate, 2–4.3×1.3–3.6 cm; petioles glabrous or slightly puberulent; inflorescence rachis pubescent 71. *S. scapiformis*
- 84b. Stems densely puberulent, villous; leaves narrowly ovate to obovate, (2.5–)3–13×(1.5–)2–8 cm; petioles densely villous; inflorescence rachis densely retrorse puberulent or villous 69. *S. baimaensis*

1. *Salvia prattii* Hemsley, J. Linn. Soc., Bot. 29: 316. 1893.

康定鼠尾草 kang ding shu wei cao

Salvia prattii var. *souliei* (H. Léveillé) Kudô; *S. souliei* H. Léveillé.

Plants perennial. Stems to 45 cm, sparsely pilose. Leaves mostly basal, long petiolate; petiole 3–17 cm, finely strigose; leaf blade oblong-hastate to ovate-cordate, 3.5–9.5×2–5.3 cm, adaxially finely strigose, abaxially densely strigose, dark purple glandular, base cordate or subhastate, margin crenate, apex obtuse. Verticillasters 2–6-flowered, in terminal racemes; rachis densely villous; bracts elliptic to obovate, 1.2–2.3×0.4–1 cm, margin entire, apex mucronate, abaxially purple veined. Pedicel to 7 mm, densely villous. Calyx campanulate, 1.6–1.9 cm, villous especially on veins, purple glandular; upper lip semicircular, 6×10 mm, short 3-tipped; lower lip as long as upper, teeth triangular, apex acute. Corolla red or violet, 4–5 cm, villous outside; tube 4–6 cm, pilose annulate at base inside, suberect or projected from calyx, ca. 4 mm wide at base, to 1.4 cm wide beyond middle; upper lip oblong, ca. 11×8 mm, slightly arcuate; lower lip longer than upper, middle lobe obcordate, ca. 7×1.3 mm; lateral lobes ovate, ca. 5 mm wide. Filaments ca. 8 mm; connectives arcuate, ca. 5.5 mm, arms equal. Style exserted. Nutlets yellow-brown, obovoid, ca. 3 mm, apex rounded. Fl. Jul-Sep.

• Grassy slopes; 3700–4800 m. Qinghai, Sichuan.

2. *Salvia potaninii* Krylov, Trudy Bot. Muz. Imp. Akad. Nauk 14: 141. 1915.

洪桥鼠尾草 hong qiao shu wei cao

Plants perennial. Stems erect 30–38 cm, unbranched, densely pilose toward apex. Petiole of basal leaves, ca. 2.5× as long as blade, petiole of upper leaves obsolete; leaf blade ovate to oblong-ovate, 3–7×1.2–5.3 cm, papery, adaxially fine strigose, pilose, abaxially fine strigose, obscurely glandular, base cordate to subhastate, margin crenate, apex obtuse. Verticillasters 6-flowered, in terminal racemes 6–10 cm; rachis densely pilose; bracts ovate to oblong-ovate, 0.8–3.5×0.5–1.5 cm. Pedicel ca. 3 mm. Calyx narrowly campanulate, 1.5–1.9 cm, densely pilose especially on veins; upper lip broadly triangular-ovate, ca. 4×9 mm, margin entire; lower lip ± as long as upper, teeth triangular-ovate. Corolla yellowish, 3.5–4 cm, villous; tube 3–3.8 cm, ± pilose annulate inside, erect, projected from calyx, ca. 4 mm wide at base, abruptly dilated at apex, to 8 mm wide at exserted part; upper lip straight, subcircular, ca. 7 mm wide; lower lip slightly longer than upper, middle lobe ca. 5×6 mm. Filaments complanate, ca. 7 mm; connectives arcuate, ca. 4.5 mm, upper arms subequal to lower ones. Nutlets unknown.

• Thickets; 4000 m. Sichuan.

3. *Salvia dolichantha* E. Peter, Acta Horti Gothob. 9: 113. 1934.

长花鼠尾草 chang hua shu di cao

Plants perennial. Stems (15–)35–80 cm, unbranched, with deciduous pilose hairs, subglabrous basally, striate in grooves. Petiole to 15 cm; leaf blade cordate-ovate to hastate-ovate, 6.5–9×5.5–9 cm, adaxially sparsely pilose, densely so on veins, abaxially subglabrous or pilose along veins, densely dark purple glandular, base cordate to hastate, margin double crenate-dentate, mucronate, apex acute. Verticillasters 3–6-flowered, in racemes 16–18 cm; rachis densely brown villous; bracts subcircular to ovate, margin ciliate. Pedicel 4–7 mm, densely brown villous. Calyx campanulate, dark purple to purplish when dry, 1.7–2 cm abaxially, 2–2.2 cm adaxially, villous on veins, glandular, glabrous inside; upper lip broadly oblate, ca. 6×13 mm; lower lip longer than upper, 2 teeth broadly triangular, ca. 5 mm, margin ciliate, apex acuminate; fruiting calyx dilated, membranous. Corolla dark purple, 4.5–5 cm, pendulous, subglabrous or pilose, finely pilose annulate inside; tube 3.5–6 cm, ca. 4 mm wide, abruptly dilated adaxially, to 1.3 cm wide at throat; upper lip straight, oblong, ca. 9 mm; middle lobe of lower lip subcircular, margin slightly crenulate; lateral lobes semicircular. Filaments ca. 9 mm; connectives semicircular, arms subequal. Style slightly exserted.

- Hills; 3700 m. Sichuan.

4. *Salvia wardii* E. Peter, Repert. Spec. Nov. Regni Veg. 39: 176. 1936.

西藏鼠尾草 xi zang shu wei cao

Plants perennial. Stems robust, 40–75 cm, densely spreading glandular hairy mainly toward apex, hairs ca. 0.5 mm. Basal leaves numerous; petiole ca. 2×as long as blade, shorter in stem leaves; basal leaf blades ovate to subhastate, 7–16×3.5–8 cm, adaxially slightly corrugate, sparsely appressed short hairy, abaxially pilose, densely so on veins, densely red glandular, base strongly cordate with rounded or subacute lobes, margin crenate, apex acute; stem leaf blades circular. Racemes or panicles terminal, ± compact; rachis densely glandular pilose; bracts glandular ciliate, lower leaflike, narrowly ovate, upper ones shorter, to 1.5 cm. Calyx broadly campanulate, 1.2–1.5 cm, ca. 1 cm wide at mouth, tinged purple, densely glandular pilose mainly along veins; upper lip entire, broadly triangular-ovate; teeth of lower lip triangular, apex acute. Corolla 3.5–4 cm, blue with white on lower lip; tube gradually dilated upward, straight, pilose annulate; upper lip ca. 1/3–1/2 as long as exserted part of tube, erect, broadly ovate, finely pilose; lower lip longer than upper, middle lobe obcordate, margin finely erose; lateral lobes semioval. Connectives curved, semicircular (specimens not seen).

- Alpine gravelly grasslands, thickets; 3600–4500 m. Xizang.

5. *Salvia digitaloides* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 234. 1912.

毛地黄鼠尾草 mao di huang shu wei cao

Plants perennial. Stems 30–60 cm, densely villous. Leaves usually basal; petiole 6–8 cm; leaf blade oblong-elliptic, 3.5–11×2–5 cm, base rounded to cordate, margin crenate, apex obtuse to rounded. Verticillasters 4–6-flowered, 3–8 in terminal racemes or panicles ca. 13 cm; rachis densely

villous; bracts obovate to ovate. Pedicel 3–4 mm, densely villous. Calyx campanulate, 1–1.2 cm, ca. 1 cm wide when open, green, purple veined, villous; upper lip broadly triangular, 2–2.5×5.6 mm, apex 3-mucronate; lower lip slightly longer, teeth broadly triangular, apex acute. Corolla yellow with purplish spots, 3.3–3.5 cm, finely pilose; tube pilose annulate inside, exserted, ca. 2.4 cm, ca. 2.5 mm wide at base, gradually curved, dilated upward, to 1 cm wide at throat; upper lip oblong, ca. 8×7 mm; lower lip longer than upper, ca. 1.2×1.3 cm; middle lobe obcordate, to 1 cm wide; lateral lobes semicircular, ca. 4 mm wide. Stamens slightly exserted; filaments ca. 7 mm; connectives ca. 6 mm, arcuate, arms subequal. Style much exserted. Nutlets gray-black, obovoid, adaxially ribbed, ca. 4×2.5 mm. Fl. Apr–Jun.

- Dry shady pine forests, grassy hillsides, valleys; 2300–3400 m. Guizhou, Sichuan, Yunnan.

- 1a. Blades adaxially pilose, abaxially densely white tomentulose, base rounded 5a. var. *digitaloides*
- 1b. Blades subglabrous, densely glandular, abaxially spreading pilose along veins, base shallowly cordate 5b. var. *glabrescens*

5a. *Salvia digitaloides* var. *digitaloides*

毛地黄鼠尾草 mao di huang shu wei cao

Leaf blade base rounded, adaxially pilose, abaxially densely white tomentulose.

- Dry shady pine forests, grassy hillsides; 2500–3400 m. Yunnan.

Used medicinally.

5b. *Salvia digitaloides* var. *glabrescens* E. Peter, Acta Horti Gothob. 9: 114. 1934.

无毛变种 wu mao bian zhong

Leaf blade base shallowly cordate, subglabrous, densely glandular except abaxially patently pilose along veins.

- Valleys; 2300–2500 m. Guizhou, Sichuan, Yunnan.

6. *Salvia przewalskii* Maximowicz, Bull. Acad. Imp. Sci. Saint Pétersbourg, sér. 3, 27: 526. 1881.

甘肃鼠尾草 gan xi shu wei cao

Plants perennial. Stems to 60 cm, branched from base, ascending, densely pubescent. Petiole 6–21 cm, 1–4 cm in stem leaves; leaf blade triangular-hastate to oblong-lanceolate, rarely cordate-ovate, 5–11×3–7 cm, adaxially minutely hirsute, base cordate to hastate, margin crenate-dentate, apex acute. Verticillasters 2–4-flowered, widely spaced, in terminal racemes or panicles 8–20 cm; rachis densely pilose; bracts ovate to elliptic, 3–8×2.5–3.5 mm, villous. Pedicel 1–5 mm, densely pilose. Calyx campanulate, ca. 1.1 cm, densely red-brown glandular, villous; upper lip triangular-semicircular, ca. 4×5 mm, ± 3-mucronate; lower lip ca. 3×6 mm, 2-cleft; teeth triangular, apex acute. Corolla purple-red and red-brown or white, 2.1–3.5(–4) cm, pilose, sparsely red-brown glandular on upper lip; tube obliquely pilose annulate inside, ca. 1.7 cm, ca. 2 mm wide below annulus, gradually dilated beyond annulus, exserted, to ca. 8 mm wide at throat; upper lip oblong, ca. 5 mm, margin entire, slightly concave, ciliate; lower lip ca. 7×11 mm; middle lobe obovate, apex subtruncate; lateral lobes semicircular. Stamens exserted; filaments ca. 4.5 mm; connectives ca. 3.5 mm, arcuate, arms

subequal. Style slightly exerted. Nutlets gray-brown, obovoid, ca. 3×2 mm. Fl. May-Aug.

Forest margins, hillsides, streamsides, thickets; 1100–4000 m. Gansu, Hubei, Sichuan, Xizang, Yunnan.

- 1a. Leaf blade abaxially ± pubescent or subglabrous 6c. var. *glabrescens*
1b. Leaf blade abaxially densely gray tomentose, tawny, or brownish tomentose.
2a. Leaf blade abaxially tawny or brownish tomentose 6b. var. *mandarinorum*
2b. Leaf blade abaxially densely gray tomentose.
3a. Inflorescences unbranched, racemose; corolla white; leaf blade lanceolate to oblong-lanceolate, short petiolate 6d. var. *alba*
3b. Inflorescences unbranched and branched, racemose and paniculate; corolla purple-red to red-brown; leaf blade triangular-hastate, rarely cordate-ovate, long petiolate 6a. var. *przewalskii*

6a. *Salvia przewalskii* var. *przewalskii*

甘西鼠尾草 gan xi shu wei cao

Salvia tatsiensis Franchet.

Leaves long petiolate, blade triangular-hastate, rarely cordate-ovate, abaxially gray-white, densely gray tomentose. Inflorescences unbranched and branched, racemose and paniculate. Corolla purple-red to red-brown.

• Forest margins, streamsides, thickets; 1100–4000 m. Gansu, Sichuan, Xizang, Yunnan.

Used medicinally.

6b. *Salvia przewalskii* var. *mandarinorum* (Diels) E. Peter, Acta Horti Gothob. 9: 115. 1934.

褐毛变种 he mao bian zhong

Salvia mandarinorum Diels, Bot. Jahrb. Syst. 29: 557. 1900; *S. feddei* H. Léveillé; *S. labellifera* H. Léveillé; *S. tibetica* H. Léveillé.

Leaf blade abaxially tawny or brownish tomentose.

• Forest margins, streamsides, thickets; 2100–3500 m. Gansu, Hubei, Sichuan, Yunnan.

6c. *Salvia przewalskii* var. *glabrescens* E. Peter, Acta Horti Gothob. 9: 115. 1934.

少毛变种 shao mao bian zhong

Leaf blade abaxially ± pubescent or subglabrous.

• Forests, forest margins, grasslands, along creeks; 2100–3500 m. Sichuan, Yunnan, Xizang.

6d. *Salvia przewalskii* var. *alba* X. L. Huang & H. W. Li, Acta Phytotax. Sin. 19: 245. 1981.

白花变种 bai hua bian zhong

Leaves short petiolate, blade lanceolate to oblong-lanceolate. Inflorescences unbranched, racemose. Corolla white.

• Hillsides; 2600–3000 m. Yunnan (Lijiang Xian).

7. *Salvia brevilabra* Franchet, Bull. Soc. Philom. Paris, ser. 8, 3: 149. 1891.

短唇鼠尾草 duan chun shu wei cao

Salvia blinii H. Léveillé; *S. souliei* Duthie ex J. H. Veitch, non H. Léveillé.

Plants perennial. Stems to 60 cm, ascending, spreading pilose. Petiole of basal leaves to 13 cm, 0.5–2.5 cm in stem leaves; basal leaf blades ovate to triangular-ovate, 9–11×5–7 cm, papery, pilose especially on veins, abaxially densely red-brown glandular, base cordate or hastate, margin coarsely crenate-serrate or double serrate, apex acute; stem leaves smaller, broadly triangular-ovate to triangular. Verticillasters 2–6-flowered, widely spaced, lower ca. 2.5 cm apart, upper somewhat compact, in racemes or panicles ca. 13 cm; rachis densely pilose; bracts elliptic to lanceolate. Pedicel 2–4 mm, densely pilose. Calyx campanulate, ca. 1 cm, pilose mainly along veins, densely dusty pubescent, margin pilose; upper lip triangular, ca. 5×8 mm, margin entire, apex ± 3-mucronate; lower lip ca. 6 mm, teeth ovate-triangular, apex short acuminate. Corolla blue-purple, ca. 2.5 cm, pilose; tube pilose annulate inside, campanulate, ca. 2 cm, adaxially dilated above middle, throat slightly constricted, ca. 9 mm in diam; upper lip ca. 5×8 mm; lower lip ca. 1×1.4 cm, middle lobe broadly obovate, 5×6–7 mm; lateral lobes semicircular, ca. 4 mm wide. Filaments ca. 7 mm; connectives arcuate, arms subequal. Nutlets dark brown, ellipsoid, glabrous, apex rounded. Fl. Jul-Aug.

• Hillsides, grasslands, forests; 3200–3800 m. Sichuan.

8. *Salvia aerea* H. Léveillé., Repert. Spec. Nov. Regni Veg. 12: 532. 1913.

橙色鼠尾草 cheng se shu wei cao

Salvia lichiangensis W. Smith; *S. pinetorum* Handel-Mazzetti.

Plants perennial. Stems 6–40 cm, densely yellow-brown villous. Leaves mostly basal; petiole 2–4 cm, shorter or absent in stem leaves; leaf blades elliptic to elliptic-lanceolate, rarely obovate or circular, 2.5–8.5(–20)×2.5–4.5(–8) cm, adaxially densely brown villous, abaxially villous, sparsely purple-brown glandular, base attenuate to shallowly cordate, margin irregularly crenate, apex obtuse; stem leaf blades elliptic, oblong to ovate or obovate, 1–5.8(–8)×1–4.5(–5) cm, margin crenate. Verticillasters 2–6-flowered, lower widely spaced, in racemes to 15 cm; rachis densely brown villous; bracts elliptic to obovate, upper 5–14×3–8 mm, margin densely villous-ciliate. Pedicel 2–4 mm, densely brown villous. Calyx campanulate, 9–10 mm, brown villous, margin villous; upper lip semicircular, ca. 5×8 mm, apex 3-mucronate; lower lip ca. 5×7 mm, teeth triangular, acute; fruiting calyx dilated, broad campanulate, conspicuously veined, densely villous on veins and margin. Corolla orange, white, dark blue, and purple, 2.6–3.5 cm, finely pilose; tube obliquely pilose annulate inside, gradually dilated to ca. 8 mm wide at throat; upper lip narrowly ovate, ca. 7×6 mm; lower lip ca. 1.2×1.7 cm, middle lobe obcordate, ca. 4×5 mm; lateral lobes semicircular, to 4 mm wide. Filaments complanate, ca. 9 mm. Nutlets brown, obovoid, adaxially ribbed, ca. 3×2 mm, slightly netted, apex glandular.

• Grasslands, hillsides, thickets, forests; 2500–3300 m. Guizhou, Sichuan, Yunnan.

Used medicinally.

9. *Salvia himmelbaurii* E. Peter, Acta Horti Gothob. 9: 117. 1934.

瓦山鼠尾草 wa shan shu wei cao

Plants perennial. Stems 30–45 cm, densely brown pilose. Petiole of stem leaves to 3× as long as blades; leaf blade cordate-ovate, 5–10×3.5–7.5 cm, adaxially densely pilose, abaxially pilose especially along veins, sparsely brownish glandular, glabrescent, base cordate, margin dentate-crenate, apex acute to short acuminate. Verticillasters 2–4-flowered, widely spaced, lower ones longer than calyx, upper shorter, in terminal racemes or panicles 7–20 cm; rachis pilose; bracts ovate. Pedicel to 4 mm, pilose. Calyx campanulate, 1–1.4 cm, densely pubescent, intermixed with red-brown glands; upper lip broadly triangular-ovate, ca. 4×5 mm, apex short acuminate; lower lip 5.5–6×5 mm, teeth triangular, apex long acuminate; fruiting calyx dilated, membranous, conspicuously veined, glabrescent, mouth ca. 1.2 cm wide, upper margin 1–3 cm, lower margin ca. 1.5 cm. Corolla purple or white, purple spotted or yellow on limb, 2.5–3.5 cm, pubescent; tube pilose annulate inside, 2–4.2 cm, adaxially gradually dilated, to 6 mm wide at throat; upper lip straight, emarginate; middle lobe of lower lip subcircular. Filaments 5–6 mm; connectives arcuate, 4–5 mm, arms subequal. Style slightly exerted. Fl. Jun-Jul.

- Grassy slopes; 3300 m. Sichuan.

10. *Salvia maximowicziana* Hemsley, J. Linn. Soc., Bot. 26: 285. 1890.

鄂西鼠尾草 e xi shu wei cao

Plants perennial. Stems 10–90 cm, glandular pilose. Petioles of basal leaves 2–2.5× as long as blades, shorter in stem leaves; leaf blade circular-cordate to ovate-cordate, 3–8(–12)×6–8(–12) cm, adaxially subglabrous or sparsely minutely hispid, abaxially pubescent along veins, glandular, base cordate to subhastate, margin coarsely crenate-dentate, sometimes double dentate and incised, apex rounded to abrupt acuminate. Verticillasters 2-flowered, widely spaced, in loose racemes or panicles; rachis glandular pilose; upper bracts lanceolate to ovate-lanceolate, 3–7 mm, margin glandular pilose. Pedicel 1–2 mm, glandular pilose. Calyx campanulate, ca. 6 mm, sparsely pilose; upper lip broadly triangular, ca. 2.5×5 mm, 3-veined, slightly reflexed, apex abrupt acuminate; lower lip ca. as long as upper teeth triangular, spinescent, slightly curved, apex mucronate; fruiting calyx dilated, ca. 0.8×1.2 cm, mouth wide open. Corolla ca. 2.2 cm, sparsely puberulent, pilose annulate inside; tube erect, adaxially slightly dilated, to 8 mm wide at throat; upper lip slightly galeate, ovate, ca. 5×4 mm, emarginate; lower lip subequal upper, middle lobe cordate, ca. 3×4 mm, margin entire; lateral lobes semicircular to subtruncate. Stamens exerted; filaments ca. 5 mm; connectives ca. 5.5 mm, arcuate, upper arms ca. 3 mm, lower arms ca. 2.5 mm. Style exerted. Nutlets yellow-brown, obovoid, slightly flattened, ca. 2.5×1.5 mm, apex rounded, base slightly acute. Fl. Jul-Aug.

- Grasslands, forest margins, hills, forests; 1800–3800 m. Gansu, Hubei, Shaanxi, Sichuan, Xizang, Yunnan.

1a. Stems erect, to 90 cm; leaf blade 6–8(–12) cm; bracts lanceolate to ovate-lanceolate, apex long acuminate; corolla yellow

..... 10a. var. *maximowicziana*

1b. Stems ascending, 10–40 cm; leaf blade 3–5(–8) cm; bracts ovate-lanceolate, apex acuminate;

corolla purple 10b. var. *floribunda*

10a. *Salvia maximowicziana* var. *maximowicziana*

鄂西鼠尾草 e xi shu wei cao

Salvia fargesii H. Léveillé.

Stems erect, to 90 cm tall. Leaf blade 6–8(–12) cm. Inflorescences raceme-panicles; bracts lanceolate to ovate-lanceolate, apex long acuminate. Corolla yellow.

- Grassy slopes, forest margins, hills, forests; 1800–3400 m. Gansu, Hubei, Shaanxi, Sichuan, Xizang, Yunnan.

10b. *Salvia maximowicziana* var. *floribunda* E. Peter, Acta Horti Gothob. 9: 116. 1934.

多花变种 duo hua bian zhong

Stems ascending, 10–40 cm tall. Leaf blade 3–5(–8) cm. Inflorescences racemes or raceme-panicles; bracts ovate-lanceolate, apex acuminate. Corolla purple.

- Grasslands, hillsides, forests; 2800–3800 m. Sichuan.

11. *Salvia paohsingensis* C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 580. 1977.

宝兴鼠尾草 bao xing shu wei cao

Plants perennial. Stems slender, ascending to suberect, to 20–40 cm, floccose-villous especially toward apex, unbranched. Petiole of basal leaves ca. 1.5–2× as long as blades, to 10 cm, obsolete in upper leaves; leaf blade triangular-ovate, 2.5–5×1–3 cm, adaxially sparsely strigose, abaxially floccose-villous, glabrescent, base cordate to subhastate, margin serrate-crenate or double serrate-crenate, apex obtuse to acute. Verticillasters 2-flowered, widely spaced, in racemes or panicles to 15 cm; rachis densely villous, finely glandular pilose; bracts lanceolate-ovate to ovate, 1–4×2–3.5 mm. Pedicel 3–5 mm, densely villous, finely glandular pilose. Calyx campanulate, 6–7 mm, villous, finely glandular pilose; upper lip semicircular, margin ciliolate, apex mucronate; lower lip slightly longer, 2-cleft; teeth triangular, apex acute. Corolla purple, white spotted on upper lip, ca. 2 cm, finely pilose; tube finely pilose annulate inside, ca. 1.5 cm, base narrow, exerted, equally dilated at apex, ca. 8 mm wide at throat; upper lip subcircular, ca. 4×4 mm; lateral lobes less than 2 mm wide. Filaments ca. 5 mm; connectives arcuate, ca. 3 mm, arms subequal. Style slightly exerted. Nutlets unknown. Fl. Jul.

- Forests; 2800 m. Sichuan.

Related to the previous species but stems villous and leaves triangular-ovate.

12. *Salvia cyclostegia* E. Peter, Acta Horti Gothob. 9: 118. 1934.

圆苞鼠尾草 yuan bao shu wei cao

Plants perennial. Stems robust, brown villous. Petiole of basal leaves 2–8 cm, shorter to obsolete in upper leaves, brown villous; leaf blade broadly ovate to circular, 2.3–13×1.2–6.5 cm, densely glandular, pilose on veins, base cordate to hastate, margin crenate, apex rounded to obtuse. Verticillasters 2–6-flowered, in racemes or panicles to 20 cm; rachis densely brown villous; lower bracts subcircular, 1–2

cm in diam., upper bracts broadly ovate to ovate. Pedicel ca. 2 mm, densely brown villous. Calyx broadly campanulate, 1–1.5 cm, sparsely glandular, brown villous along veins; upper lip entire, emarginate; lower lip slightly longer, teeth triangular, apex short mucronate. Corolla sparsely pubescent, densely so on upper lip outside; tube pilose annulate inside, base cylindrical, apex dilated on upper side, 2–3 cm, slightly curved upward; upper lip erect, circular-ovate, ca. 9 mm; lower lip longer, middle lobe obcordate, ca. 0.8×1.2 cm, margin slightly undulate, glabrous; lateral lobes semicircular, ca. 5 mm wide, ciliate. Filaments ca. 7 mm; connectives ca. 6 mm, arcuate, arms subequal. Style exserted. Nutlets unknown. Fl. Apr–May.

• Forests, hillsides, grasslands, bamboo forests, pine forests; 2700–3300 m. Sichuan, Yunnan.

- 1a. Corolla white, yellowish, or cream-yellow, sometimes with few gray spots 12a. var. *cyclostegia*
1b. Corolla purplish or reddish 12b. var. *purpurascens*

12a. *Salvia cyclostegia* var. *cyclostegia*

圆苞鼠尾草 yuan bao shu wei cao

Corolla white, yellowish, or cream-yellow, sometimes with few gray spots.

• Hillsides, grasslands, bamboo forests, pine forests; 2700–3300 m. Sichuan, Yunnan.

12b. *Salvia cyclostegia* var. *purpurascens* C. Y. Wu, Fl. Yunnan. 1: 664. 1977.

紫花变种 zi hua bian zhong

Corolla purplish or reddish.

• Forests; 2900–3200 m. Sichuan, Yunnan.

13. *Salvia cynica* Dunn, Notes Roy. Bot. Gard. Edinburgh 8: 164. 1913.

犬形鼠尾草 quan xing shu wei cao

Plants perennial. Stems erect, 30–50 cm, sparsely pubescent. Petiole of stem leaves 1–11 cm; leaf blade broadly ovate to broadly hastate-ovate or subcircular, 5–20×3–18 cm, sparsely hirtellous, abaxially sparsely yellow-brown glandular, base cordate-hastate, margin double dentate or serrate, apex acuminate. Verticillasters 2–6-flowered, widely spaced, in raceme-panicles to 20 cm; rachis pubescent; bracts lanceolate, 5–10 mm. Pedicel ca. 5 mm, pubescent. Calyx tubular, always purplish, pilose, sparsely red-brown glandular; tube 1.3–1.5 cm; upper lip broadly triangular, ca. 4×10 mm, apex with a mucro to 1.5 mm; lower lip ca. 6×8 mm, teeth narrowly triangular, apex acuminate; fruiting calyx slightly dilated, membranous. Corolla yellow, to 4 cm, subglabrous; tube finely pilose annulate inside; upper lip oblong, ca. 10×8 mm; lower lip subequal upper, spreading; middle lobe obcordate, margin shallow undulate; lateral lobes nearly semicircular. Filaments ca. 8 mm; connectives ca. 1.1 cm, upper arms ca. 7 mm, lower ca. 4 mm. Style slightly exserted. Nutlets brown, globose, ca. 2.8 mm in diam. Fl. Jul–Aug.

• Streamsides, forests; 1500–3200 m. Sichuan.

14. *Salvia omeiana* E. Peter, Acta Horti Gothob. 9: 119. 1934.

峨眉鼠尾草 e mei shu wei cao

Plants perennial. Stems erect, 40–100 cm, robust, to 6 mm in diam. at base, striate, puberulent or subglabrous. Stem

leaf blades broadly cordate-ovate to hastate-ovate, 10–16×6.5–14.5 cm, adaxially sparsely fine strigose, abaxially purple, sparsely puberulent along veins, sparsely yellowish glandular, base cordate to subhastate, margin double crenate or dentate, apex acuminate or caudate-acuminate. Verticillasters 2(–6)-flowered, widely spaced, in raceme-panicles; rachis glandular pubescent or subglabrous; bracts lanceolate to broadly ovate, 5–8(–10)×1.5–3 mm. Pedicel ca. 2 mm, glandular pubescent or subglabrous. Calyx narrow campanulate, 1–1.5 cm, glandular pilose on veins, sparsely yellowish glandular; upper lip subtruncate, entire, apical mucro 1–2 mm; lower lip longer than upper, teeth triangular, apex acuminate; fruiting calyx dilated, ca. 1.3 cm wide at mouth. Corolla yellow, 2.5–3.5 cm, puberulent outside; tube gradually dilated adaxially at apex, curved upward from base, ca. 2–3.5 cm; upper lip broadly ovate, 7–8×ca. 3.5 mm; lower lip longer than upper, middle lobe obcordate, ca. 4×6 mm; lateral lobes ca. 3 mm wide. Filaments ca. 6 mm; connectives arcuate, ca. 6 mm, arms subequal. Style exserted. Nutlets obovoid, ca. 3 mm in diam., brown. Fl. Jul–Sep.

• Forest margins, hillsides; 1400–3100 m. Sichuan.

- 1a. Bracts broadly ovate to subcircular, apex short mucronate to caudate, nearly as long as calyx; corolla tube slightly pilose annulate inside 14b. var. *grandibracteata*
1b. Bracts lanceolate to broadly lanceolate, apex long acuminate, shorter than calyx; corolla tube without hairy annulus inside 14a. var. *omeiana*

14a. *Salvia omeiana* var. *omeiana*

峨眉鼠尾草 e mei shu wei cao

Bracts lanceolate to broadly lanceolate, apex long acuminate, shorter than calyx. Corolla tube without hairy annulus inside.

• Forest margins, hillsides; 2200–3100 m. Sichuan.

14b. *Salvia omeiana* var. *grandibracteata* E. Peter, Acta Horti Gothob. 9: 120. 1934.

宽苞变种 kuan bao bian zhong

Bracts broadly ovate to subcircular, apex short mucronate to caudate, nearly as long as calyx. Corolla tube slightly pilose annulate inside.

• Forests, grassy hillsides; 1400–2300 m. Sichuan.

15. *Salvia alatipetiolata* Sun, Bull. Nanjing Coll. Pharmacy 5: 63. 1960.

翅柄鼠尾草 chi bing shu wei cao

Plants perennial. Stems erect, ca. 40 cm, purple-brown, densely glandular pubescent. Basal leaves numerous; petiole 5–14 cm, narrowly winged; blade ovate-hastate, 3.5–6×1.5–4.5 cm, adaxially glabrescent, abaxially densely gray tomentose, base cordate to subhastate, cuneate-decurrent, margin irregularly crenulate, apex obtuse to acute; stem leaf petioles 0.5–5 cm, blade gradually reduced toward apex, ovate to ovate-hastate, 1–3×0.8–1.5 cm. Verticillasters 2–4-flowered, widely spaced, in loose raceme-panicles; rachis densely glandular pubescent; bracts ovate to oblong, 4–7 mm. Pedicel 3–5 mm, densely glandular pubescent. Calyx campanulate, purple, ca. 1.1 cm, finely pilose; upper lip broadly triangular, ca. 3×7 mm; lower lip ca. 5×8 mm, teeth

triangular, apical spine less than 1 mm; fruiting calyx slightly enlarged, papery. Corolla yellowish, ca. 2 cm, white villous; tube pilose annulate inside, ca. 1.6 cm, gradually dilated adaxially, ca. 9 mm wide at throat; upper lip ca. 4×5 mm; lower lip ca. 5×13 mm, middle lobe ca. 4×8 mm, flabellate, emarginate; lateral lobes to 4 mm wide. Filaments ca. 7 mm; connectives arcuate, ca. 1.8 mm, upper arms ca. 0.8 mm, lower arms ca. 1 mm. Nutlets yellow-brown, globose, ca. 2 mm in diam., glabrous. Fl. Jul-Aug.

- Grassy hillsides; 3800 m. Sichuan.

16. *Salvia evansiana* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien Math.-Naturwiss. Kl., Anz. 62: 236. 1925.

雪山鼠尾草 xue shan shu wei cao

Plants perennial. Stems erect, 13–45 cm, striate, densely brown villous or glabrescent. Petiole 2–10(–20) cm; leaf blade ovate to triangular-ovate, 2–11×1–11 cm, adaxially densely strigose-villous, spreading brown villous, sparsely dark brown glandular along veins, base cordate, rarely shallow hastate, margin crenate, apex acute to rounded. Verticillasters 6-flowered, crowded apically, lax basally, in racemes or panicles 10–20 cm; rachis brown villous; bracts villous, ciliate at margin, abruptly acuminate to acute at apex; upper bracts ovate, to 1.7 cm. Pedicel ca. 8 mm, brown villous. Calyx broadly campanulate, 1–1.7 cm, sparsely dark brown glandular outside, villous on veins; upper lip broad ovate, ca. 5×13 mm, entire or 3-mucronate; lower lip longer than upper, teeth triangular, apical spine to 1 mm. Corolla straight, 2.6–3.5 cm, pilose; tube pilose annulate inside, 2–3.4 cm, ca. 5 mm wide below annulus, adaxially abruptly dilated beyond annulus, ca. 1.1 cm wide at throat; upper lip semicircular, 5–7 mm; lateral lobes ovate, ca. 4 mm wide. Filaments ca. 4.5 mm; connectives short, 2–3 mm, arcuate, upper arms shorter than to as long as lower arms. Fl. Jul-Oct.

- Alpine meadows, hillsides, forests; 3400–4300 m. Sichuan, Yunnan.

- 1a. Leaves basal and on stem; lower bracts shorter than to as long as calyx; calyx 1.4–1.7 cm; corolla blue-purple except yellow at base 16a. var. *evansiana*
- 1b. Leaves basal or on stem base; lower bracts longer than calyx; calyx 1–1.2 cm; corolla white or cream-yellow 16b. var. *scaposa*

16a. *Salvia evansiana* var. *evansiana*

雪山鼠尾草 xue shan shu wei cao

Leaves basal and on stem. Lower bracts shorter than to as long as calyx. Calyx 1.4–1.7 cm. Corolla blue-purple except yellow at base.

- Alpine meadows, hillsides, forests; 3400–4200 m. Sichuan, Yunnan.

Used medicinally.

16b. *Salvia evansiana* var. *scaposa* E. Peter, Acta Horti Gothob. 9: 122. 1934.

葶花变种 ting hua bian zhong

Salvia rockiana E. Peter.

Leaves basal or on stem base. Lower bracts longer than calyx. Calyx 1–1.2 cm. Corolla white or cream-yellow.

- Alpine meadows; 3400–4300 m. Yunnan.

17. *Salvia pauciflora* E. Peter, Acta Horti Gothob. 9: 122. 1934.

少花鼠尾草 shao hua shu wei cao

Plants perennial. Roots sometimes dilated. Stems 2–4, slender, ascending or suberect, unbranched, with widely spaced leaves, densely villous or glabrescent. Petiole 2–2.5×as long as blades, shorter to obsolete in upper leaves; leaf blade broadly ovate to ovate-triangular, 2.5–6(–7)×1.2–5 cm, hispid or strigose, rusty, brown glandular, base cordate to hastate, margin crenate, apex acute or obtuse to rounded. Inflorescences spreading brown villous, glandular pilose; verticillasters 2-flowered, widely spaced, in racemes or panicles 2–8 cm; lower bracts leaflike, upper ones ovate, shorter than calyx, slightly strigose, ciliate. Pedicel ca. 2 mm. Calyx campanulate, 5–7 mm, glandular pilose; upper lip ± semicircular, entire, apex acute; lower lip slightly longer than adaxial, teeth ovate-triangular, apex subacute. Corolla purplish red or purple-white, rarely purplish, white spotted on lower lip, 1.3–2 cm or rarely more, sparsely pilose or subglabrous; tube fine pilose annulate inside, gradually dilated at apex, slightly curved upward, 1–1.4 cm, ca. 6 mm wide at throat; upper lip subcircular, ca. 5.5×5 mm, emarginate; middle lobe of lower lip flabellate, ca. 3×5.5 mm, undulate; lateral lobes ± semicircular, ca. 2.5 mm wide. Filaments ca. 4 mm; connectives ca. 4 mm, arcuate, arms subequal. Style slightly exerted. Nutlets unknown.

- Forest margins, forests; 2800–3400 m. Yunnan.

18. *Salvia schizocalyx* E. Peter, Acta Horti Gothob. 9: 123. 1934.

裂萼鼠尾草 lie e shu wei cao

Plants perennial. Stems ca. 45 cm, 1 to few, ascending to erect, unbranched, densely yellow-brown villous, with widely spaced leaves. Petiole ca. 3×as long as blade to obsolete, densely villous; leaf blade broadly ovate to narrowly triangular-ovate, rarely oblong-ovate, 2–5(–10)×1.2–4.5(–5) cm, papery, corrugate when young, adaxially villous, abaxially subglabrous, spreading villous on veins, without glands, base cordate to rounded, margin irregularly double crenate, apex obtuse to rounded. Verticillasters 2–4-flowered, in terminal racemes; lower bracts leaflike, broadly ovate to rhombic-ovate, subequal to calyx, gradually reduced toward apex, glandular hairy, margin dentate, apex acuminate to subacute. Calyx campanulate, 2-lipped to 1/2 its length, ca. 1 cm in flower, to 1.5–1.8 cm in fruit, villous, glandular hairy, tube as long as limb; upper lip broadly triangular, margin entire, with 3 minute, ovate-lanceolate acuminate teeth. Corolla violet or blue, 2–2.5 cm, pilose; tube obliquely interrupted pilose annulate inside, ca. 2 cm, base cylindrical, adaxially gradually dilated beyond hairy annulus, erect; upper lip ca. 5 mm, straight, broadly ovate to circular. Connectives arcuate, lower arms slightly shorter than upper. Fl. and fr. Jul-Aug.

- Hills; 4000 m. Yunnan.

19. *Salvia brachyloma* E. Peter, Acta Horti Gothob. 9: 124. 1934.

短冠鼠尾草 duan guan shu wei cao

Plants perennial. Stems 1 to few, 20–57 cm, erect, retrorse villous. Petiole 1–13 cm; leaf blade hastate to narrowly ovate, 3.5–11×2–5 cm, densely red-brown glandular, adaxially densely white pubescent when young, pubescent with age, abaxially densely white pubescent when young, glabrous except for puberulent veins, base shallowly cordate to hastate, margin irregularly crenulate, apex acute to short acuminate. Inflorescences densely spreading villous, glandular pilose; verticillasters 2-flowered, widely spaced, in terminal racemes or panicles 1–15 cm; bracts broadly ovate, 6–9 mm, slightly pilose, red-brown glandular, ciliate, apex abruptly acuminate. Pedicel ca. 2 mm. Calyx campanulate, (1–)1.3–1.6 cm, villous especially on veins, red-brown glandular; upper lip broadly triangular, 4–5×ca. 9 mm, margin entire, apex mucronate; lower lip slightly longer than upper, teeth triangular, apex mucronate. Corolla purplish, 2–2.3 cm, pubescent; tube obliquely and continuously pilose annulate inside, ca. 1.6 cm, ca. 2.5 mm wide at base, adaxially gradually dilated to apex, slightly constricted, ca. 8 mm wide at throat; upper lip obcordate, ca. 3×5 mm; lower lip enlarged, ca. 5×11 mm; middle lobe subflabellate, ca. 3×6 mm, undulate; lateral lobes semicircular, to 3 mm. Filaments ca. 5 mm; connectives 1.8–2 mm, arms equal. Style slightly exerted. Nutlets obovoid, ca. 2 mm, black. Fl. Jun-Jul.

• Grassy slopes, forested grasslands; 3200–3800 m. Sichuan, Yunnan.

20. *Salvia lankongensis* C. Y. Wu, Fl. Yunnan. 1: 666. 1977.

洱源鼠尾草 er yuan shu wei cao

Plants perennial. Stems erect, 23–28 cm, densely pilose. Petiole 0.5–12 cm; leaf blade elliptic-ovate, (2.5–) 3–6×1.5–4.5 cm, papery, adaxially pilose, abaxially pilose along veins, red-brown glandular, base subtruncate to shallowly cordate, margin shallowly crenate, apex rounded. Inflorescences pilose; verticillasters 6-flowered, in terminal racemes or raceme-panicles; bracts oblong-elliptic, acute, shorter than calyx. Pedicel 2–3 mm. Calyx campanulate, 9–10 mm, villous, glandular, minutely hispid inside, blackish when dry; upper lip semicircular, ca. 2.5×6 mm, 5-veined; lower lip 2-toothed, teeth triangular, apex short acuminate to acute. Corolla blue, 1.7–1.9 cm; tube ca. 1 cm, base glabrous, apex pilose outside, obliquely pilose annulate inside, straight, adaxially gradually dilated to apex; upper lip straight, ca. 6×7 mm; lower lip ca. 8×9 mm, middle lobe subobcordate, ca. 4×7 mm; lateral lobes ovate. Filaments ca. 5 mm, glabrous; connectives 2–2.5 mm, arcuate. Style exerted. Nutlets unknown. Fl. Jul.

• Grasslands, thickets; 3800 m. Yunnan.

21. *Salvia mairei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 12: 532. 1913.

东川鼠尾草 dong chuan shu wei cao

Salvia calthaefolia H. Léveillé; *S. leclerei* H. Léveillé.

Plants perennial. Stems 1 to few, 20–40 cm, erect to ascending, densely brown villous. Stem leaves 1 or 2 pairs; petiole 6.5 cm to obsolete; leaf blade cordate-ovate to subhastate-ovate, 3.5–5(–8)×ca. 1.8–5(–8) cm, finely corrugate, adaxially densely villous, abaxially densely pubescent, sparsely brown glandular, base cordate to subhastate, margin irregularly crenate, apex acute to obtuse. Inflorescences densely brownish villous, glandular pilose; verticillasters 4-flowered, in terminal racemes or panicles 8–

11 cm; lower bracts leaflike, gradually reduced upward, broadly ovate, shorter than calyx. Pedicel 3–4 mm. Calyx campanulate, ca. 1.2 cm, villous mainly on veins, sparsely glandular pilose, 2-lipped to ca. 1/3 its length; upper lip ± semicircular, ca. 5×7 mm, strongly 2-toothed; teeth triangular-ovate, 3–4 mm, apex acute. Corolla violet or purple, 1.5–1.8 cm; tube adaxially gradually dilated, slightly longer than calyx, pilose, pilose annulate inside; upper lip obcordate, ca. 5 mm, densely white bearded; middle lobe of lower lip cordate-orbicular, margin shallowly undulate; lateral lobes broadly ovate, ciliate. Filaments ca. 6 mm; connectives ca. 2 mm, slightly curved. Style exerted. Nutlets unknown. Fl. Jul-Aug.

• Hillsides. Yunnan.

22. *Salvia pogonochila* Diels ex Limpricht, Repert. Spec. Nov. Regni Veg. Beih. 12: 478. 1922.

毛唇鼠尾草 mao chun shu wei cao

Herbs. Stems ascending, 30–50 cm, white pilose. Petiole 1–12 cm; stem leaf blades broadly ovate to triangular-hastate, 2.5–8×1.5–7 cm, adaxially pubescent, glabrous on veins, abaxially densely pubescent, sparsely rusty brown glandular, base cordate to hastate, margin crenate-dentate, apex acute. Inflorescences densely white villous, glandular hairy; verticillasters 2(–4)-flowered, in raceme-panicles to 25 cm; peduncle to 3.5 cm; bracts ovate-lanceolate. Pedicel ca. 3 mm. Calyx campanulate, violet when fresh, black-purple on veins, brownish or yellow-brown on upper lip when dry, 8–9 mm, villous, rusty brown glandular, 2-lipped to ca. 1/3 its length; upper lip broadly triangular, ca. 3×6 mm, apex 3 dentate; lower lip 2-cleft, teeth triangular, apex acute. Corolla blue-purple, 1.4–1.8 cm, tube campanulate, pilose, pilose annulate inside; upper lip suborbicular, ca. 4×5 mm, densely villous outside; middle lobe of lower lip broadly obovate, apex emarginate, ca. 3×5.5 mm; lateral lobes semicircular, ca. 3.5 mm wide. Filaments ca. 5 mm; connectives ca. 2 mm. Style exerted. Nutlets yellow-brown, obovoid, ca. 2.5 mm, apex rounded. Fl. Jul-Sep.

• Alpine meadows; 3800 m. Sichuan.

23. *Salvia schizochila* E. Peter, Acta Horti Gothob. 9: 126. 1934.

裂瓣鼠尾草 lie ban shu wei cao

Plants perennial. Stems erect, unbranched, 20–25 cm, densely white villous, sparsely glandular, glabrescent toward base. Petiole ca. 2×as long as blade, slightly thickened, villous; leaf blade broadly cordate-ovate, 4–9×4–9 cm, margin mucronulate denticulate-crenulate, apex subacute. Racemes dense, 2–6.5 cm; rachis densely fine villous; lower bracts leaflike, upper bracts broadly ovate, long acuminate, shorter than to subequal to calyx. Pedicel fine villous, 3–5 mm. Calyx campanulate, 1.2–1.5 cm, sparsely glandular, pilose on veins, 2-lipped to ca. 1/3 its length; upper lip subcircular, with 3 teeth 0.5–1 mm; teeth of lower lip ovate-triangular, ca. 4 mm. Corolla purplish, 1.8–2.2 cm; tube slightly exerted to 2 cm, adaxially gradually dilated, ca. 8 mm wide at mouth, projected, subglabrous, pilose annulate inside; upper lip ca. 5 mm, straight, 2-lobed nearly to its base; lobes ovate, subacute, finely white villous outside, glabrous on margin; lower lip

almost as long as upper, middle lobe subcircular; lateral lobes ovate-triangular. Connectives 2–3 mm (specimens not seen).

• Forests; 3800–4300 m. Yunnan.

24. *Salvia campanulata* Wallich ex Bentham, Pl. Asiat. Rar. 1: 67. 1830.

钟萼鼠尾草 *zhong e shu wei cao*

Plants perennial. Stems erect, 43–80 cm, finely strigose or villous. Petiole (1–)3–25 cm; leaf blade cordate to ovate-truncate, 4–18×3.5–13.5 cm, abaxially pilose to pubescent or densely pilose along veins, base cordate to truncate, margin incised-crenate, apex acuminate. Inflorescences densely villous, glandular pilose; verticillasters 2–6-flowered, widely spaced, in terminal raceme-panicles; bracts ovate, 4–9 mm. Pedicel 2–5 mm. Calyx campanulate, ca. 1.3 cm, shallowly 2-cleft to strongly 2-lipped, villous, glandular pilose, sparsely black-brown glandular, margin ciliate; upper lip broadly ovate, ca. 3×10 mm, apex acute; lower lip as long as upper, ca. 9 mm wide, apex with 2 triangular acute teeth. Corolla yellow, ca. 2.7 cm, subglabrous except upper lip villous; tube pilose annulate inside, gradually curved, dilated beyond hairy annulus, to 8 mm at throat; upper lip ovate, ca. 7×5 mm, slightly arcuate; lower lip 1–1.2×1.2 cm, obliquely spreading; middle lobe obcordate, ca. 4×8 mm, slightly constricted at base; lateral lobes triangular-ovate, ca. 3 mm wide. Stamens slightly exerted or nearly included; filaments ca. 6.5 mm; connectives ca. 1 cm, upper arms ca. 6 mm, lower arms ca. 4 mm. Style slightly exerted. Nutlets brown, narrowly obovoid. Fl. Jul-Sep.

Forest margins, forests, hillsides, valleys; 800–3800 m. Xizang, Yunnan [Bhutan, India (Sikkim), Myanmar, Nepal].

Four varieties have sometimes been recognized as follows:

- 1a. Calyx apex shallowly 2-cleft to subtruncate; leaf blade subglabrous, adaxially ± densely pilose on veins, margin ciliate; bracts acuminate to acute 24b. var. *codonantha*
- 1b. Calyx apex ± 2-cleft; leaf blade appressed villous adaxially, pilose or pubescent along veins abaxially; bracts acuminate.
 - 2a. Calyx strongly 2-lipped 24c. var. *fissa*
 - 2b. Calyx 2-lipped to shallowly so.
 - 3a. Stems and leaves finely strigose; bracts caudate 24d. var. *hirtella*
 - 3b. Stems villous; leaf blade appressed villous adaxially, pilose or pubescent along veins abaxially; bracts acuminate 24a. var. *campanulata*

24a. *Salvia campanulata* var. *campanulata*

钟萼鼠尾草 *zhong e shu wei cao*

Stems villous. Leaf blade adaxially appressed villous, abaxially pilose or pubescent along veins. Bracts acuminate. Calyx 2-lipped to shallowly so.

Forest margins; 3200 m. Yunnan [India (Sikkim), Nepal].

24b. *Salvia campanulata* var. *codonantha* (E. Peter) E. Peter, Repert. Spec. Nov. Regni Veg. 39: 180. 1936.

截萼变种 *jie e bian zhong*

Salvia codonantha E. Peter, Acta Horti Gothob. 9: 127. 1934.

Leaf blade subglabrous except adaxially ± densely pilose on veins and margin ciliate. Bracts acuminate to acute.

Broad-leaved forests, grassy hillsides; 800–3800 m. Yunnan [Myanmar].

24c. *Salvia campanulata* var. *fissa* E. Peter, Repert. Spec. Nov. Regni Veg. 39: 179. 1936.

裂萼变种 *lie e bian zhong*

Calyx strongly 2-lipped, upper lip 1–1.2 cm, lower lip 1.2–1.5 cm, teeth of lower lip ca. 5 mm.

Yunnan [India (Sikkim)].

24d. *Salvia campanulata* var. *hirtella* E. Peter, Repert. Spec. Nov. Regni Veg. 39: 179. 1936.

微硬毛变种 *wei ying mao bian zhong*

Stems and leaves finely strigose. Bracts caudate.

Shady valleys; 2800 m. Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

25. *Salvia sikkimensis* E. Peter, Repert. Spec. Nov. Regni Veg. 39: 177. 1936.

锡金鼠尾草 *xi jin shu wei cao*

Plants perennial. Stems 1 or 2, erect to ascending, villous, unbranched. Petiole of lower stem leaves ca. 2×as long as blades; leaf blade ovate, to 12×9.5 cm, ± membranous, adaxially fine strigose, abaxially pubescent mainly on veins, glandular, base cordate to subhastate, margin mucronulate-crenate, apex obtuse to subacute. Inflorescences densely to sparsely villous, glandular pilose; verticillasters 2(–6)-flowered, in terminal raceme-panicles 6–15 cm; bracts ovate to rhombic-ovate, apex abruptly acuminate, glandular pilose. Pedicel 3–10 mm. Calyx funnelform-campanulate to campanulate, ca. 1 cm in flower, slightly dilated to 1.5 cm in fruit, villous, glandular pilose, intermixed with yellow-brown glands; upper lip triangular-ovate, ca. 3×10 mm, apex spiny-acute; teeth of lower lip broadly triangular, apex short spiny. Corolla yellow-white or reddish and purple spotted, ca. 2.8 cm, sparsely pilose especially on upper lip; tube obliquely pilose annulate on basal 3–5 mm inside, ca. 1.8 cm, base tubular, constricted at hairy annulus but gradually dilated, to 1 cm wide at throat; upper lip projected, subobovate, ca. 7×6 mm. Filaments ca. 5 mm; connectives ca. 6 mm, arms equal. Style exerted. Nutlets unknown. Fl. Aug.

Forests, forest margins, hillsides, streamsides; 3300 m. Xizang [Bhutan, India (Sikkim)].

- 1a. Calyx campanulate, gradually dilated from base; plants not robust 25a. var. *sikkimensis*
- 1b. Calyx funnelform-campanulate, attenuate at base, dilated, 2-lipped at apex; plants robust 25b. var. *chaenocalyx*

25a. *Salvia sikkimensis* var. *sikkimensis*

锡金鼠尾草 *xi jin shu wei cao*

Plants not robust. Calyx campanulate, gradually dilated from base.

Forests, grassy forest margins, gravelly hillsides, streamsides; 3300 m. Xizang [Bhutan, India (Sikkim)].

25b. *Salvia sikkimensis* var. *chaenocalyx* E. Peter, Repert. Spec. Nov. Regni Veg. 39: 178. 1936.

张萼变种 *zhang e bian zhong*

Plants robust. Calyx funnelform-campanulate, base attenuate, apex dilated, 2-lipped.

Xizang [Bhutan, India (Sikkim)].

26. *Salvia handelii* E. Peter, Acta Horti Gothob. 9: 129. 1934.

木里鼠尾草 mu li shu wei cao

Plants perennial. Stems 1 or 2, ascending, 50–80 cm, finely pubescent or glabrescent. Petiole 2–3× as long as blade; leaf blade broadly ovate-triangular to subcircular, 8–19×ca. 4–19 cm, adaxially pubescent, abaxially spreading pilose especially on veins, without glands, base cordate to hastate, margin irregularly double crenate to subdentate, ciliate, apex acute to subobtusate. Verticillasters 2-flowered, in terminal racemes or raceme-panicles; rachis somewhat densely tawny or brownish pilose, glandular hairy; bracts broadly ovate to subcircular, 0.5–1.5 cm, mostly entire but lower bracts dentate. Calyx broadly campanulate, truncate at mouth, scarcely 2-lipped, tinged a brilliant color, 1–1.5×1–1.5 cm, sparsely glandular, glandular pilose on margin and veins. Corolla green-white, with violet spots, 1.8–2.2 cm; tube short tubular at base, adaxially dilated at apex, exserted, subglabrous, densely white pilose annulate inside; upper lip circular, 3–4 mm wide, densely white pubescent; lower lip subequal upper, middle lobe circular, undulate; lateral lobes ovate, ciliate. Connectives short, arcuate (specimens not seen).

• Grassy slopes on limestone mountains; 3800–3900 m. Sichuan.

27. *Salvia hylocharis* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 236. 1912.

林华鼠尾草 lin hua shu wei cao

Salvia forrestii Diels; *S. hylocharis* var. *subsimplax* C. Y. Wu.

Plants perennial. Stems 1 or 2, 45–90 cm tall, ascending to erect, unbranched, villous toward apex, glabrescent toward base. Petiole 2–13 cm; leaf blade ovate-triangular to ovate-hastate, 3–8.5(–14)×ca. 8.5(–14) cm, papery, adaxially pilose, abaxially pilose along veins, sparsely yellow-brown glandular, base cordate, margin irregularly crenate, apex obtuse to acute. Inflorescences densely villous; verticillasters 2–4-flowered, in racemes or raceme-panicles; bracts broadly ovate to subcircular, shorter than calyx. Pedicel ca. 4 mm. Calyx broadly tubular-campanulate, 1.7–2.2 cm, villous mainly along veins and margin, sparsely yellow-brown glandular; tube ca. 1.5 cm; upper lip semicircular-triangular, ca. 4×13 mm; lower lip shallowly 2-toothed, teeth broadly triangular, apex acute. Corolla yellow, (2.2–)3.5–3.8 cm; tube sparsely pilose or subglabrous, pilose annulate inside, ca. 3 mm wide at base, adaxially gradually dilated to 1.4 cm wide at throat; limb pilose, ciliate; upper lip ca. 1 cm, straight; lower lip to 1.7 cm, middle lobe flabellate, ca. 0.6×1.3–1.5 cm; lateral lobes obliquely ovate, to 5 mm. Filaments ca. 6 mm; connectives ca. 9 mm, upper arms ca. 6 mm. Style exserted. Nutlets obovoid. Fl. Jul-Sep.

• Grassy slopes, forest margins, streamsides, tufts of grass; 2800–4000 m. Xizang, Yunnan.

28. *Salvia hupehensis* E. Peter, Acta Horti Gothob. 9: 130. 1934.

湖北鼠尾草 hu bei shu wei cao

Plants perennial. Stems 35–55 cm, erect, glabrescent except for ± densely villous nodes. Petiole subequal to blade; leaf blade cordate-orbicular, 4–8 cm, mid stem blades largest, adaxially densely appressed villous, abaxially sparsely villous, densely glandular, margin crenate-serrate, apex rounded or acuminate with apical tooth enlarged. Verticillasters 2-flowered, widely spaced, in loose raceme-panicles; rachis densely glandular pilose; bracts caudate-acuminate, glandular pilose; upper bracts broadly ovate, 3–5 mm. Pedicel 3–5 mm. Calyx campanulate, 8–10 mm, 4–5 mm wide at mouth, ciliolate, 2-lipped to 1/3 its length, veins spreading glandular villous; upper lip entire, broadly ovate-triangular, apex short acuminate; teeth of lower lip ovate, apex long acuminate, 3–4 mm; fruiting calyx adaxially dilated, upper lip reflexed. Corolla purple, 3–4.5 cm, tube to 3 cm, adaxially gradually dilated to 1–1.5 cm wide at mouth, slightly curved upward, glabrous, pilose annulate inside; upper lip broadly ovate, 1–1.4 cm, curved upward at 45° from base; lobes circular, ciliolate, fine pilose abaxially; lower lip ca. 1.5× as long as upper, middle lobe broadly obcordate, shallowly undulate, violet when dry. Connectives curved, 0.8–1.2 cm, finely pilose on joints, lower arms ca. 1/2 as long as upper. Immature nutlets chestnut brown, subglobose (specimens not seen).

• Hubei.

29. *Salvia smithii* E. Peter, Acta Horti Gothob. 9: 131. 1934.

橙香鼠尾草 cheng xiang shu wei cao

Plants aromatic, perennial. Stems 30–90 cm, densely pubescent with a mixture of villous and glandular pilose hairs. Petiole 2–16 cm; leaf blade broadly cordate-ovate to ovate-hastate, 4–22×3–18 cm, adaxially finely strigose, abaxially spreading pilose on veins, sparsely red-brown glandular, base cordate to hastate, margin dentate-crenate, apex acuminate. Inflorescences densely glandular pilose, villous; verticillasters 2-flowered, in loose, much branched raceme-panicles; bracts ovate to lanceolate-ovate, nearly as long as pedicels or slightly shorter than calyx. Pedicel ca. 5 mm. Calyx campanulate, 1.4–1.7 cm, enlarged in fruit, glandular villous, yellow-brown glandular outside; upper lip broadly triangular-ovate, margin entire, apex acuminate; lower teeth ovate-triangular, 4–5 mm, apex acuminate. Corolla yellow, 4–4.5 cm; tube ca. 3.3 cm, subglabrous, pilose annulate inside, slightly dilated at base, dilated and curved upward, ca. 1.1 cm wide at mouth; upper lip broadly ovate, ca. 1.2 cm, margin ciliate, densely brown glandular pilose outside; lower lip ca. 1.3×1.4 cm, middle lobe broadly obovate, ca. 0.9×1.3 cm, margin undulate; lateral lobes obliquely triangular-ovate, ca. 4 mm wide. Filaments ca. 8 mm; connectives ca. 1 cm, curved, semicircular, arms equal. Style slightly exserted. Nutlets brown, obovoid, ca. 2 mm, apex rounded. Fl. Aug-Sep.

• Hillsides, riverbanks, valleys; 2600–3500 m. Sichuan.

30. *Salvia heterochroa* E. Peter, Acta Horti Gothob. 9: 132. 1934.

异色鼠尾草 yi se shu wei cao

Plants perennial. Stems 1 (or 2), striate, black-brown, densely brownish pilose apically, glabrescent basally. Petiole 1–22 cm; leaf blade elliptic-ovate, 4–13×2.5–10 cm, papery, adaxially glabrous, abaxially yellow-brown on veins when dry, gray cobwebby-tomentose, minutely glandular, base

shallowly cordate to subtruncate, margin coarsely double crenate, apex obtuse to rounded. Inflorescences densely brownish silky-villous, glandular pilose; verticillasters 2–6-flowered, widely spaced, in raceme-panicles; bracts leaflike basally, gradually reduced apically, margin crenate, longer than calyx, upper bracts entire. Pedicel 3–6 mm. Calyx campanulate, 1–1.5 cm, glandular pilose, 2-lipped to ca. 1/3 its length; upper lip broadly triangular-ovate, margin entire, apex acute or 3-mucronate; lower teeth ovate-triangular, apex acute. Corolla blue-purple or dark purple, 2.5–3 cm; tube slightly zigzag, projected, adaxially abruptly dilated, curved upward, white cobwebby-pilose, pilose annulate inside; upper lip broadly ovate, ca. 9 mm, glandular pilose; lower lip slightly longer than upper, middle lobe obovate-orbicular, ca. 1×2 cm, glabrous; lateral lobes obovate. Filaments ca. 3 mm; connectives curved, ca. 5 mm, arms equal. Style as long as corolla. Nutlets dark brown, globose-ovoid, ca. 4 mm. Fl. Sep.

- Grassy slopes; 3500–3800 m. Yunnan.

31. *Salvia atropurpurea* C. Y. Wu, Fl. Yunnan. 1: 676. 1977.

暗紫鼠尾草 an zi shu wei cao

Plants perennial. Stem 1, erect, ca. 50 cm, brown, brownish villous, glabrescent toward base. Petiole of lower stem leaves longest, 12–15 cm, 5–10 mm in upper leaves; leaf blade ovate to broadly ovate, 3.5–10.5×2.5–9 cm, finely corrugate, adaxially densely pubescent, abaxially densely gray cobwebby-tomentose, base shallowly cordate, margin double crenate, apex obtuse to acute. Inflorescences densely brown villous, glandular pilose; verticillasters 2–6-flowered, remote basally, crowded apically, in terminal racemes or panicles 6–15 cm; bracts ovate, 0.6–1.5 cm×4–10 mm. Pedicel 3–4 mm. Calyx campanulate, 1.3–1.5 cm, densely spreading villous on veins, 2-lipped to ca. 1/3 its length; upper lip broadly triangular, ca. 6×8.5 mm; lower lip subequal upper, teeth triangular, apex acute. Corolla dark purple, 2.5–3 cm, pilose, pilose annulate inside; tube straight, slightly dilated apically, to 1 cm wide at mouth; upper lip straight, slightly concave, ca. 7.5×7–7.5 mm; middle lobe of lower lip obovate, ca. 5×8.5 mm. Filaments ca. 5.5 mm; connectives ca. 8 mm, arms subequal. Nutlets unknown. Fl. Jul.

- Grassy slopes; 3400 m. Yunnan.

Only differing from the previous species in indumentum characters.

32. *Salvia bulleyana* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 233. 1912.

戟叶鼠尾草 ji ye shu wei cao

Plants perennial. Stems few branched, densely yellow-brown villous, glandular pilose apically, glabrescent basally. Stem leaves 2–4 pairs; petiole 0.5–12 cm; leaf blade ovate to ovate-triangular, (2.5–)3.5(–6) cm wide, adaxially finely pilose, abaxially pilose on veins, sparsely purple-brown glandular, base cordate to hastate, margin crenate or crenate-serrate, apex acute, rarely subobtuse. Inflorescences densely yellow-brown villous; verticillasters 4-flowered, in loose racemes or panicles 15–30 cm; bracts broadly ovate to ovate, to 1 cm. Pedicel 4–6 mm. Calyx campanulate, ca. 1 cm in flower, to 1.3 cm in fruit, yellow-brown villous, sparsely purple-brown glandular, 2-lipped to 1/3 its length; upper lip broadly triangular-ovate, ca. 4×7 mm, apex 3-mucronate;

lower lip ca. 5×7 mm, teeth triangular-ovate, apex acute to subacuminate. Corolla purple-blue, ca. 2 cm, villous outside especially abaxially; tube obliquely pilose annulate inside, ca. 1.5 cm, narrowed at base, adaxially dilated beyond calyx, slightly curved at apex; upper lip ca. 5 mm; lower lip slightly longer, middle lobe subflabellate; lateral lobes obliquely ovate. Filaments ca. 5 mm; connectives ca. 8 mm, arms subequal. Style exerted. Nutlets brown with purple spots, ca. 1.5 mm. Fl. and fr. Aug.

- Hillsides; 2100–3400 m. Yunnan.

33. *Salvia castanea* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 233. 1912.

栗色鼠尾草 su se shu wei cao

Plants perennial. Stems 1 to few, 30–65 cm, pilose toward base, densely villous upward. Petiole 2–13 cm; leaf blade elliptic-lanceolate to oblong-ovate, 2–22×2–9 cm, glabrescent or ± hairy, abaxially subglabrous, base rounded to subcordate, rarely subtruncate, margin irregularly crenate to dentate, apex obtuse to subacute. Inflorescences densely villous, glandular pilose; verticillasters 2–4-flowered, widely spaced, in racemes or panicles; bracts ovate to broadly ovate, 4–10×2.5–8 mm. Pedicel 4–5 mm. Calyx campanulate, 0.9–1.5 cm, densely glandular villous, yellow-brown glandular, 2-lipped to ca. 1/3 its length; upper lip broadly triangular-semicircular, ca. 3×6 mm; lower lip slightly longer, ca. 4×6 mm; teeth triangular, apex acute. Corolla purple-brown, chestnut brown, or dark purple, 3–3.2 cm, pilose; tube obliquely pilose annulate inside, ca. 2.6 cm, zigzag toward base, curved upward beyond calyx, to 1 cm wide at mouth; upper lip ovate, ca. 6 mm, erect, falcate/slightly galeate; lower lip triangular, ca. 0.8×1.4 cm; middle lobe obovate, ca. 4×6 mm; lateral lobes semicircular, ca. 5 mm wide. Filaments ca. 7 mm; connectives ca. 5 mm, arms subequal. Nutlets obovoid, ca. 3 mm, apex rounded. Fl. May-Sep.

Forests, hillsides, grasslands; 2500–3800 m. Sichuan, Xizang, Yunnan [Nepal].

The forms *castanea*, *glabrescens*, *pubescens* E. Peter (Acta Horti Gothob. 9: 134. 1934), and *tomentosa* E. Peter (Repert. Spec. Nov. Regni Veg. 39: 181. 1936) have been differentiated largely on differences in hairiness of leaf surfaces.

34. *Salvia atrorubra* C. Y. Wu, Fl. Yunnan. 1: 679. 1977.

暗红鼠尾草 an hong shu wei cao

Plants perennial. Stems erect, to 55 cm, floccose-villous. Petiole 10(–12) cm; leaf blade ovate, (5–)6–10.5×(3–)4–8 cm, ± membranous, densely brownish or brown floccose-tomentose-villous when young, adaxially sparsely villous, abaxially villous especially along veins, sparsely yellowish glandular with age, base cordate to hastate, margin irregularly crenate to shallowly obtuse serrate, apex acute. Inflorescences densely pubescent, villous; verticillasters 2–4-flowered, in axillary racemes ca. 10 cm and terminal ones 10–12 cm, interrupted toward base, ± continuous toward apex; peduncle to 5 cm; lower bracts leaflike, margin dentate; upper bracts subcircular to broadly ovate, 1–1.5×0.6–1.2 cm, margin entire. Pedicel 3–4 mm. Calyx campanulate, ca. 1.8 cm, subtruncate or obscurely 2-lipped, veins slightly villous; upper lip truncate; lower lip longer, ca. 2 mm; teeth triangular, apex acute, mucronate. Corolla red, ca. 3.5 cm, villous, adaxially constricted just below hairy annulus, adaxially dilated, slightly curved upward beyond middle, slightly constricted, ca.

1.1 cm wide at throat; upper lip subcircular, ca. 1 cm in diam.; lower lip \pm semicircular, ca. 1.7 cm wide; middle lobe subobcordate, ca. 7 mm wide. Filaments ca. 8 mm, slightly curved; connectives ca. 8 mm. Style exerted. Nutlets unknown. Fl. Jun.

- Forests; 2700 m. Yunnan.

Close to *Salvia castanea*, but with reddish corollas and subtruncate, scarcely 2-lipped calyces.

35. *Salvia flava* Forrest ex Diels, Notes Roy. Bot. Gard. Edinburgh 5: 235. 1912.

黄花鼠尾草 huang hua shu wei cao

Plants perennial. Stems erect, 20–50 cm, pilose or glabrescent. Petiole 0–14 cm; leaf blade ovate to triangular-ovate, 2–7 \times 3.5–5 cm, adaxially appressed pilose, abaxially pubescent along veins, purple-brown glandular, base hastate or rarely cordate, margin crenate or double crenate, apex acute to subobtusate. Inflorescences densely villous, glandular pubescent; verticillasters 4-flowered, 4–8 \pm remote in terminal racemes or panicles; bracts ovate, shorter to longer than calyx. Pedicel ca. 3 mm. Calyx campanulate, ca. 1–1.5 cm in flower, glandular pilose or pilose, sparsely purple-brown glandular, 2-lipped to ca. 1/3 its length; upper lip triangular-ovate, ca. 3 \times 6 mm, apex 3-mucronate; lower lip slightly longer than upper, ca. 5 \times 6 mm; teeth triangular, apex acute. Corolla yellow or brown or purple spotted on middle lobe, 2.3–3 cm; tube obliquely pilose annulate inside, cylindric toward base, curved upward, dilated at throat; upper lip \pm falcate/galeate, 7–10 mm; middle lobe of lower lip subobovate to subflabellate, ca. 0.8–1.8 cm wide; lateral lobes nearly semicircular; filaments ca. 7 mm; connectives ca. 9 mm, upper arms ca. 5 mm, lower arms ca. 4 mm. Style slightly exerted. Nutlets unknown. Fl. Jul.

- Forests, forest margins, hillsides, grasslands; 2400–4000 m. Sichuan, Yunnan.

Closely related to *Salvia bulleyana* and often regarded as a synonym of it.

- 1a. Calyx ca. 1 cm; middle lobe of lower corolla lip yellow, ca. 0.8 cm wide 35a. var. *flava*
- 1b. Calyx 1.3–1.5 cm; middle lobe of lower corolla lip yellow, conspicuously brown or purple spotted, to 1.8 cm wide 35b. var. *megalantha*

35a. *Salvia flava* var. *flava*

黄花鼠尾草 huang hua shu wei cao

Salvia chingii C. Y. Wu ex Sun.

Calyx ca. 1 cm. Middle lobe of lower corolla lip yellow, ca. 8 mm wide.

- Forests, hillsides, grasslands, 2500–4000 m. Sichuan, Yunnan.

35b. *Salvia flava* var. *megalantha* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 236. 1912.

大花变种 da hua bian zhong

Calyx 1.3–1.5 cm. Middle lobe of lower corolla lip to 1.8 cm wide, yellow, conspicuously brown or purple spotted.

- Open hillsides, grasslands, wet forest margins; 2400–3900 m. Yunnan.

36. *Salvia bifidocalyx* C. Y. Wu & Y. C. Huang, Fl. Yunnan. 1: 675. 1977.

开萼鼠尾草 kai e shu wei cao

Plants perennial. Stems few, slender, ascending, to 33 cm, densely puberulent, apex villous. Leaves 2 or 3 pairs; petiole of basal leaves 7–9 cm, 1–4.5 cm in stem leaves; leaf blade hastate, 2–5 \times 1.7–3 cm, papery, adaxially pubescent except for veins, abaxially sparsely purple-black glandular, pubescent on veins, base hastate, margin crenulate, apex \pm acute. Verticillasters 2(–4)-flowered, in terminal racemes or panicles (1–)2–9 cm; lower bracts leaflike; upper bracts ovate, shorter than calyx, purple-black glandular. Pedicel 3–5 mm. Calyx campanulate, 1–1.2 cm, densely villous, glandular pilose, 2-lipped to ca. 1/2 its length; upper lip triangular-ovate, ca. 6 mm; lower lip ca. 5 mm, teeth ovate-triangular; fruiting calyx dilated, broadly campanulate, membranous. Corolla yellow-brown with purple-black spots on lower lip, 1.5–1.7 cm; tube imperfectly hairy annulate inside; upper lip slightly reflexed, slightly concave, purple-black glandular; middle lobe of lower lip largest, obcordate, 5–5.5 mm wide. Stamens exerted; filaments ca. 4 mm; connectives ca. 6 mm. Nutlets unknown. Fl. Jul.

- Rocky mountains; 3500 m. Yunnan.

Distinguished in the original description from *Salvia flava* by the smaller corolla only slightly longer than the calyx.

37. *Salvia kiaometiensis* H. Léveillé, Bull. Acad. Géogr. Bot. 25: 25. 1915.

荞麦地鼠尾草 qiao mai di shu wei cao

Plants perennial. Stems 25–50 cm, yellow-brown tomentose-villous or glabrescent. Petiole 9–21 cm; leaf blade ovate, 4–15 \times 2–10 cm, adaxially minutely hispid to densely pilose, abaxially gray tomentulose to subglabrous, sparsely yellow-brown glandular, base cordate, margin crenate, apex acute. Inflorescences densely yellow-brown villous, glandular pilose; verticillasters 2–4-flowered, compact, in terminal racemes; bracts broadly ovate to subcircular, 1–2.4 cm, obtuse, base rounded, apex mucronate. Pedicel ca. 3 mm. Calyx \pm narrow campanulate, 1.3–1.5 cm, yellow villous, 2-lipped nearly ca. 1/3 its length; upper lip broadly semicircular-triangular, ca. 3.5 \times 9 mm, apex mucronate; lower lip subequal adaxial, ca. 8 mm wide; teeth triangular-ovate, apex mucronate; fruiting calyx slightly dilated, ca. 1.7 cm, veins conspicuously elevated outside. Corolla purple-brown or red, 2.8–3.5 cm, pilose; tube imperfectly pilose annulate inside, cylindric, ca. 3.5 mm wide at base, to 9 mm wide at throat; upper lip straight, slightly concave or falcate, ca. 7 mm; lower lip slightly longer than upper, middle lobe obcordate, ca. 4 \times 6 mm. Filaments ca. 5.5 mm; connectives 6–7 mm, arcuate, upper arms slightly longer than lower. Nutlets dark brown, obovoid, ca. 4 mm, rounded, abaxially striate. Fl. May–Nov, fr. Nov.

- Hillside grasslands; 2300–3200 m. Sichuan, Yunnan.

Used medicinally.

The forms *kiaometiensis*, *pubescens*, and *tomentella* E. Peter (Acta Horti Gothob. 9: 134. 1934) have been differentiated largely on differences in leaf surface hairs.

38. *Salvia subpalmatinervis* E. Peter, Acta Hort. Gothob. 9: 135. 1934.

近掌脉鼠尾草 jin zhang mai shu wei cao

Plants perennial. Taproot blackish, to 1.5 cm in diam. Stems 1–3, erect, to 50 cm, glandular villous. Leaves mostly basal, stem leaves ca. 2-paired; petiole nearly as long as to longer than blade; leaf blade ovate to circular, 3.5–10(–13.5)×to 10(–13.5) cm, adaxially densely appressed villous, abaxially glandular, spreading pilose on veins, base cordate or ± hastate, margin crenate, apex obtuse to rounded or subacute. Inflorescences densely glandular villous; verticillasters 2–6-flowered, in terminal racemes 10–15 cm; lower bracts leaflike, upper bracts ovate, to ca. 2 cm. Pedicel 4–5 mm. Calyx campanulate, 1.5–2 cm, narrower at mouth, spreading villous, glandular pilose mainly along veins, glandular ciliate at mouth; upper lip ca. 3 mm, margin entire, apex mucronate or 3-serrulate; lower lip ca. 5 mm, teeth triangular. Corolla purplish or blue-purple, ca. 3.5 cm, pilose, base imperfectly pilose annulate inside; tube zigzag, cylindrical toward base, adaxially abruptly dilated above middle, curved downward at an angle; upper lip shallowly falcate/galeate. Filaments ca. 6 mm; connectives ca. 6 mm, arms subequal, lower anther cells smaller, apex united. Nutlets unknown. Fl. May-Jul.

- Thickets, forests, hilly grasslands; 3400–4000 m. Yunnan.

39. *Salvia mekongensis* E. Peter, Acta Horti Gothob. 9: 136. 1934.

湄公鼠尾草 mei gong shu wei cao

Plants perennial. Stems 1–5, ascending to erect, pilose or glabrescent. Stem leaves few; petiole of basal leaves 2–3×as long as blade, petioles of upper leaves obsolete; leaf blade ovate to oblong-ovate, rarely subcircular or elliptic, 3–9×2–8 cm, adaxially appressed villous, abaxially glandular, spreading pilose on veins or densely villous when young, base cordate to shallowly hastate, apex obtuse to rounded. Inflorescences densely villous, glandular hairy; verticillasters 2-flowered, in terminal racemes or panicles 6–10 cm, crowded apically; upper bracts ovate to broadly ovate, villous, glandular. Pedicel ca. 4 mm. Calyx campanulate, 1–1.5 cm, glandular, glandular villous on veins, 2-lipped to more 1/2 its length; upper lip triangular-ovate, apex 3-mucronate; lower teeth narrowly triangular, apex acuminate. Corolla yellow, 3.5–4 cm, glandular pilose; tube imperfectly pilose annulate on basal 5–6 mm inside, ca. 3×as long as calyx, tubular toward base, adaxially abruptly dilated on exerted part, straight or curved upward, to 1.1 cm at throat; upper lip straight or slightly reflexed, ca. 6×6 mm; lower lip slightly longer than upper, middle lobe obcordate, ca. 8 mm wide. Filaments ca. 5 mm; connectives ca. 6 mm, arcuate, arms equal. Nutlets unknown.

- Hilly grasslands; 2800–4100 m. Yunnan.

40. *Salvia nipponica* Miquel var. ***formosana*** (Hayata) Kudô, Mem. Fac. Sci. Taihoku Imp. Univ. 2: 157. 1929.

台湾琴柱草 tai wan qin zhu cao

Salvia formosana Hayata.

Plants perennial. Stems 20–50 cm, retrorse spiny-hirsute, unbranched. Stem leaves many paired; petiole 1–10 cm, retrorse spiny-hirsute; leaf blade triangular-ovate to triangular-hastate, 2–7(–9)×1.3–6(–7) cm, minutely hispid, glandular, base hastate to subtruncate, margin irregularly dentate or serrate, apex caudate-acuminate. Inflorescences densely retrorse spiny-hirsute; verticillasters 2–6-flowered, somewhat widely spaced, in terminal racemes ca. 6 cm; bracts

ovate to narrowly ovate, 6–12 mm. Pedicel 3–5 mm. Calyx campanulate, ca. 9 mm, dilated after anthesis, densely hirsute along veins, sparsely glandular, 2-lipped to ca. 1/3 its length; upper lip broadly triangular, margin entire, apex rounded. Corolla yellow with red spots, 2.2–2.4 cm, pubescent; tube transversely pilose annulate, ca. 1.3 cm; upper lip oblong, ca. 1.9 cm; lower lip almost as long as upper lip, middle lobe obcordate, lateral lobes narrowly triangular. Filaments, ca. 4 mm; connectives ca. 8 mm, upper arms ca. 5.5 mm, lower arms ca. 2.5 mm. Style much exerted. Nutlets unknown. Fl. Jul-Aug.

- Taiwan.

41. *Salvia sonchifolia* C. Y. Wu, Fl. Yunnan. 1: 679. 1977.

莒叶鼠尾草 ju ye shu wei cao

Plants perennial. Stems erect, ca. 30 cm, densely retrorse pubescent. Leaves mostly basal; stem leaves 1-paired; petiole 4–6.5 cm, puberulent; leaf blade oblong, 4–6.5×1.5–3 cm, papery, adaxially glabrous, abaxially glabrous or puberulent on veins, base cuneate or subtruncate, margin undulate or obscurely crenate, apex rounded. Inflorescences densely puberulent; verticillasters 2-flowered, in terminal racemes 4.5–7 cm; bracts shorter than pedicels. Pedicel 3–6 mm. Calyx campanulate, 8–8.5 mm, finely pilose along veins, finely pubescent, sparsely yellowish glandular, margin ciliolate, 2-lipped to ca. 1/3 its length; upper lip tinged dark purple, semicircular, ca. 2.5×5.5 mm, apex 3-mucronate; lower lip purplish, longer than upper, strongly 2-toothed. Corolla purple, to 3.5 cm, pubescent, indistinctly pilose annulate inside; upper lip subcircular, ca. 6 mm wide; lower lip longer than upper, ovate, ca. 7×9 mm; middle lobe obcordate, apex emarginate, margin undulate; lateral lobes ovate. Filaments ca. 3 mm; connectives ca. 1.5 mm, arms subequal, anther cells subequal. Fl. Apr-May.

- Wet forest humus on limestone mountains; 1300–1500 m. Yunnan.

42. *Salvia tricuspis* Franchet, Bull. Soc. Philom. Paris, ser. 8, 3: 150. 1891.

黄鼠狼花 huang shu lang hua

Salvia marretii H. Léveillé.

Herbs annual or biennial. Stems erect, 30–95 cm, pubescent, glandular villous, much branched. Petiole 1–11 cm, shorter toward stem apex, sparsely villous; leaf blade 3-lobed, triangular-hastate, or sagittate, 3–12×2.2–12 cm, adaxially pilose or pubescent, abaxially pubescent, glandular, base cordate, with ovate, acute basal lobes, margin serrate or crenate above base, apex acuminate to acute. Inflorescences pubescent, glandular villous; verticillasters 2(–4)-flowered, widely spaced; bracts narrowly lanceolate, 3–9×1.2–1.5 mm, margin entire or 2–4-toothed. Pedicel ca. 4 mm. Calyx campanulate, 0.9–1.1 cm, sparsely yellow-brown glandular, veins and margin glandular villous; upper lip triangular, ca. 3×6 mm, apex ± 3-mucronate; lower lip subequal upper, teeth obtusely triangular, apex short acuminate. Corolla yellow, 2.1–2.3 cm, pilose; tube ca. 1.5 cm, transversely pilose annulate inside, cylindrical toward base, abruptly dilated, curved upward beyond hairy annulus; upper lip oblong, ca. 6.5×6 mm; lower lip ca. 5×12 mm. Fertile stamens exerted; filaments ca. 5 mm; connectives ca. 6.5 mm, arcuate, upper

arms longer. Nutlets obovoid, ca. 3×2 mm, brown, rounded. Fl. Jul-Sep, fr. Sep-Oct.

• Foothills, riverbanks, streamsides, grasslands; 1400–3000 m. Gansu, Shaanxi, Shanxi, Sichuan.

43. *Salvia umbratica* Hance, J. Bot. 8: 75. 1870.

荫生鼠尾草 yin sheng shu wei cao

Herbs annual or biennial. Stems erect, to 1.2 m, villous, sometimes glandular villous. Petiole 1–9 cm; leaf blade triangular to ovate-triangular, 3–16×2.3–16 cm, adaxially pubescent or minutely hispid, abaxially sparsely yellow-brown glandular, villous on veins, base cordate to subtruncate, basal lobes ovate, apex acute to obtuse, margin double crenate or dentate, apex acuminate to caudate-acuminate. Inflorescences villous, glandular pubescent; verticillasters 2-flowered, widely spaced, in terminal and axillary racemes; upper bracts lanceolate, 3–6×1–3 mm. Pedicel ca. 2 mm. Calyx campanulate, 7–10 mm, slightly dilated after anthesis, villous, 2-lipped to ca. 1/3 its length; upper lip ca. 3×6 mm, apex 3-mucronate; lower lip somewhat larger than upper, teeth obliquely triangular, apex acute. Corolla blue-purple or purple, 2.3–2.8 cm, slightly pubescent; tube imperfectly pilose annulate inside, narrow, cylindrical toward base, exerted part abruptly dilated, curved upward, to 7 mm wide at throat; upper lip oblong-obcordate, 8×6–7 mm; lower lip ca. 7×to 12 mm; lateral lobes lunate, ca. 3 mm wide. Filaments ca. 5 mm, glabrous; connectives ca. 7.5 mm, arcuate, upper arms ca. 4 mm, lower arms ca. 3.5 mm. Style as long as upper corolla lip to exerted. Nutlets ellipsoid. Fl. Aug-Oct.

• Hillsides, valleys; 600–2000 m. Anhui, Gansu, Hebei, Hubei, Shaanxi, Shanxi.

44. *Salvia roborowskii* Maximowicz, Bull. Acad. Imp. Sci. Saint Pétersbourg, sér. 3, 27: 527. 1881.

粘毛鼠尾草 zhan mao shu wei cao

Herbs annual or biennial. Stems erect, 30–90 cm, much branched, densely viscid-hirsute. Petiole 2–6 cm, gradually shorter toward stem apex; leaf blade hastate to hastate-triangular, 3–8×2.5–5.5 cm, strigose, abaxially yellowish glandular, base shallowly cordate to truncate, margin crenate, apex acute to obtuse. Verticillasters 4–6-flowered, in terminal and axillary racemes, widely spaced at base; upper bracts lanceolate to ovate, 0.5–1.5 cm, glandular villous, intermixed with yellow-brown glands, margin undulate or entire. Pedicel ca. 3 mm. Calyx campanulate, 6–8 mm in flower, dilated after anthesis, hirsute, glandular pubescent, intermixed with yellowish brown glands, 2-lipped to 1/3 its length; upper lip triangular-semicircular, ca. 3.5×5 mm, apex 3-mucronate; lower lip nearly as long as adaxial, teeth triangular, apical spine ca. 1 mm. Corolla yellow, 1–1.3(–1.6) cm, pilose or subglabrous; tube imperfectly pilose annulate inside, somewhat exerted, slightly constricted below middle, exerted part dilated, to ca. 5 mm wide at throat; upper lip straight, oblong, ca. 4.5×2.7 mm, margin entire; lower lip longer than upper, ca. 3.5×7 mm; middle lobe obcordate, ca. 1.5×3 mm. Filaments ca. 4 mm; connectives arcuate, ca. 4 mm, arms subequal. Nutlets obovoid, ca. 2.8×1.9 mm, dark brown. Fl. Jun-Aug, fr. Sep-Oct.

• Grasslands, hillsides, foothills, wet streamsides; 2500–3700 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

45. *Salvia officinalis* Linnaeus, Sp. Pl. 1: 23. 1753.

撒尔维亚 sa er wei ya

Herbs perennial. Stems erect, woody at base, minutely white tomentose, much branched. Petiole 0–3 cm; leaf blade oblong to elliptic or ovate, 1–8×0.6–3.5 cm, papery, finely corrugate, minutely white tomentose, base rounded or subtruncate, margin crenulate, apex acute to mucronate, rarely acute. Verticillasters 2–18-flowered, in terminal racemes 4–18 cm; upper bracts broadly ovate, apex acuminate. Pedicel ca. 3 mm. Calyx campanulate, 1–1.1 cm in flower, dilated to 1.5 cm in fruit, minutely tomentose on veins and margin, sparsely golden yellow glandular, ± tinged purple, 2-lipped to ca. 1/2 its length; upper lip shallowly 3-toothed, teeth subulate; lower teeth triangular, apex acuminate. Corolla purple or blue, 1.8–1.9 cm, minutely tomentose; tube imperfectly pilose annulate inside, straight, ca. 9 mm; upper lip straight, obovoid, ca. 6×5.5 mm; lower lip ca. 1×1 cm. Filaments ca. 5 mm; connectives ca. 3 mm, arms equal. Nutlets dark brown, subglobose, ca. 2.5 mm in diam. Fl. Apr-Jun.

Cultivated in China as a medicinal and aromatic herb [Europe].

46. *Salvia trijuga* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 237. 1912.

三叶鼠尾草 san ye shu wei cao

Herbs perennial. Stems erect, 30–60 cm, villous. Leaves simple or ternate compound, rarely 5-foliolate, lower stem leaves ternate, long petiolate, upper simple or ternate; petiole 5–7 cm, petiolule of terminal leaflet 0.8–3 cm; terminal leaflet ovate to elliptic-cordate, 5–6×4–5 cm, adaxially densely appressed bristly, abaxially sparsely yellowish glandular, pilose on veins, base cordate to truncate, margin crenate, apex obtuse; lateral leaflets ovate to circular-ovate, 1–4×0.5–2.8 cm. Inflorescences densely villous, glandular pubescent; verticillasters 2-flowered, widely spaced, in terminal racemes or panicles; bracts lanceolate to narrowly ovate, 5–12×1–3 mm, glandular ciliate. Pedicel ca. 3 mm. Calyx campanulate, 1–1.1 cm, glandular villous, 2-lipped to ca. 1/4 its length; upper lip 2.5×6 mm, 3 teeth broadly triangular, apex obtuse; lower lip as long as upper, 2 teeth triangular, apex acute to subacute. Corolla blue-purple with yellow spots; tube ca. 2 cm, cylindrical toward base, abruptly dilated on exerted part, subglabrous or slightly pubescent, without conspicuous hairy annulus inside; upper lip falcate, ca. 9 mm, pubescent; lower lip longer, middle lobe transversely elliptic to subcircular, ca. 5×9 mm, margin undulate, apex emarginate; lateral lobes obliquely triangular, obtuse, ca. 2 mm wide. Filaments ca. 5 mm; connectives ca. 8 mm, arcuate, arms ± subequal. Nutlets blackish, narrowly ellipsoid. Fl. Jul-Sep.

• Hillsides, streamsides, grasslands, thickets, forests, valleys; 1900–3900 m. Sichuan, Xizang, Yunnan.

Used medicinally.

47. *Salvia yunnanensis* C. H. Wright, Bull. Misc. Inform. 1896: 164. 1896.

云南鼠尾草 yun nan shu wei cao

Salvia bodinieri Vaniot; *S. esquirolii* H. Léveillé.

Plants perennial. Tuberos roots 2 or 3, scarlet outside. Stems erect, ca. 30 cm, densely spreading white villous. Leaves mostly basal; petiole 2.5–10 cm, villous; blade simple, trifid, or pinnate; stem leaves 1- or 2-paired, short petiolate; blade of simple leaves oblong-elliptic, 2–8×1.5–3.5 cm, papery, abaxially purplish, densely or sparsely villous, rarely

glabrescent, finely corrugate, base cordate to rounded, margin crenate, apex obtuse to rounded; terminal lobes of compound leaves largest, ovate to elliptic. Inflorescences villous, glandular puberulent; verticillasters 4–6-flowered, widely spaced, in terminal racemes or panicles 7–13 cm; bracts shorter than pedicels, pubescent. Pedicel ca. 3 mm. Calyx campanulate, 7–9 mm, abaxially tinged purple, glandular, villous on veins; upper lip broadly triangular, ca. 2.5×6.5 mm, apex mucronate; lower lip ca. 3×5 mm. Corolla blue-purple, 2.5–3 cm, pubescent; tube sparsely puberulent below middle inside, 1.3–1.5 cm, funnellform, ca. 2.5 mm wide at base, to 6 mm wide at throat; upper lip falcate, 9–11×ca. 4.5 mm; middle lobe of lower lip with undulate margin; lateral lobes ovate, ca. 2.5 mm wide. Filaments ca. 3 mm; connectives 6–10 mm, upper arms ca. 2×as long as upper. Nutlets black, ellipsoid. Fl. Apr–Aug.

• Grassy hillsides, forest margins, dry thin forests; 1800–2900 m. Guizhou, Sichuan, Yunnan.

Used medicinally.

48. *Salvia miltiorrhiza* Bunge, Mém. Acad. Sci. St. Petersbourg Divers Savans 2: 124. 1833.

丹参 dan shen

Plants perennial. Taproot thickened, succulent, scarlet outside. Stems erect, 40–80 cm tall, villous, much branched. Leaves simple to odd-pinnate; petiole 1.3–7.5 cm, densely retrorse villous, petiolule 2–14 mm; leaflets 3–5(–7), 1.5–8×1–4 cm, blades or leaflets circular to broadly lanceolate, pilose, densely so abaxially, margin crenate, apex acute to acuminate. Inflorescences densely villous or glandular villous; verticillasters 6- to many flowered, basally remote, apically crowded, in terminal or axillary racemes 4.5–17 cm; bracts lanceolate. Pedicel 3–4 mm. Calyx campanulate, purplish, ca. 1.1 cm, slightly dilated after anthesis, sparsely villous or glandular villous, margin ciliate; upper lip entire, triangular, ca. 4×8 mm, apex 3-mucronate; lower lip almost as long as upper, 2-toothed. Corolla purple-blue or white, 2–2.7 cm, glandular pubescent, densely so on upper lip; tube imperfectly fine pilose annulate inside, exerted, shorter than limb, 2 mm wide at base, to 8 mm wide at throat; upper lip 1.2–1.5 cm, falcate; lower lip shorter, middle lobe ca. 5×to 10 mm, 2-lobulate; lateral lobes rounded, ca. 3 mm wide. Filaments 3.5–4 mm; connectives 1.7–2 cm. Style much exerted. Nutlets ellipsoid, ca. 3.2×1.5 mm. Fl. Apr–Aug, fr. Sep–Oct.

Hillsides, streamsides, forests; 100–1300 m. Anhui, Hebei, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Shandong, Shanxi, Zhejiang [Japan].

- 1a. Leaves odd-pinnate; leaflets ovate or elliptic-ovate to broadly lanceolate 48a. var. *miltiorrhiza*
1b. Leaves simple or 3-foliolate; blades or leaflets orbicular to suborbicular 48b. var. *charbonnelii*

48a. *Salvia miltiorrhiza* var. *miltiorrhiza*

丹参 dan shen

Salvia anomala Vaniot; *S. miltiorrhiza* f. *alba* C. Y. Wu & H. W. Li; *S. pogonocalyx* Hance.

Leaves odd-pinnately compound; leaflets ovate or elliptic-ovate to broadly lanceolate.

Hillsides, streamsides, grassy places in forests; 100–1300 m. Anhui, Hebei, Henan, Hunan, Jiangsu, Shaanxi, Shandong, Shanxi, Zhejiang [Japan].

Used medicinally for coronary diseases.

48b. *Salvia miltiorrhiza* var. *charbonnelii* (H. Lévillé) C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 148. 1977.

单叶变种 dan ye bian zhong

Salvia charbonnelii H. Lévillé, Repert. Spec. Nov. Regni Veg. 9: 220. 1911.

Leaves simple, sometimes 3-foliolate; blades or leaflets orbicular to suborbicular.

- Hillsides, grassy places. Hebei, Henan, Hubei, Shanxi.

49. *Salvia bowleyana* Dunn, J. Linn. Soc., Bot. 38: 363. 1908.

南丹参 nan dan shen

Plants perennial. Stems robust, ca. 1 m. Leaves 1- (or 2)-pinnate, 10–20 cm, 5(–7)-foliolate; petiole 4–6 cm, concave-convex, retrorse villous or densely spreading bristly; terminal leaflet ovate-lanceolate, 4–7.5×2–4.5 cm, herbaceous, glabrous, finely pilose on veins, margin crenate-serrate or serrate, apex acuminate to caudate-acuminate; lateral leaflets smaller. Inflorescences densely glandular villous; verticillasters 8- to many flowered, in terminal racemes or panicles 14–30 cm; bracts lanceolate, 3–4×ca. 1 mm, margin entire, ciliate. Pedicel ca. 4 mm. Calyx tubular, 8–10 mm, glandular pilose, pubescent, white bristly at throat inside, 2-lipped to ca. 1/4 its length; upper lip broadly triangular, ca. 2×5 mm, apex ± 3-mucronate; lower lip triangular, ca. 1.5×4 mm, apex shallowly 2-toothed. Corolla purple to blue-purple, 1.9–2.4 cm, puberulent; tube obliquely hairy annulate, gradually dilated at apex, to 7 mm wide at throat; upper lip slightly falcate, 0.8–1.2 cm×ca. 5 mm; lower lip oblong, ca. 1.1×1.2 cm; middle lobe obcordate, ca. 3×6 mm. Filaments ca. 4 mm; connectives ca. 1.9 cm; upper arms to 1.5 cm, lower arms ca. 4 mm. Nutlets brown, ellipsoid, ca. 3 mm, apex hairy. Fl. Mar–Jul.

• Hillsides, streamsides, forests, valleys; 0–1000 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

- 1a. Leaves 1-pinnately compound; petioles and stem retrorse villous 49a. var. *bowleyana*
1b. Leaves 2-pinnately compound; petioles and stem densely spreading bristly 49b. var. *subbipinnata*

49a. *Salvia bowleyana* var. *bowleyana*

南丹参 nan dan shen

Salvia miltiorrhiza Bunge var. *australis* E. Peter.

Stems retrorse villous. Leaves 1-pinnately compound; petiole retrorse villous.

• Hillsides, streamsides, forests, valleys; 0–1000 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

Used medicinally.

49b. *Salvia bowleyana* var. *subbipinnata* C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 582. 1977.

近二回羽裂变种 jin er hui yu lie bian zhong

Stems densely patent setose. Leaves 2-pinnately compound; petiole densely patent setose.

- Zhejiang.

50. *Salvia dabieshanensis* J. Q. He, Acta Bot. Yunnan. 11: 409. 1989.

大别山丹参 da bie shan dan shen

Plants perennial. Stem solitary, rarely branched, erect, to 1 m, tawny pubescent, retrorse pilose toward base, densely glandular pilose and villous toward apex. Stem leaves odd-pinnate, leaflets (3-)5-7; petiole 5-15 cm, petiolule of terminal leaflet 0.8-3 cm; terminal leaflet ± ovate-lanceolate, 3-13×1.5-5 cm, margin irregularly crenate; lateral leaflets elliptic-lanceolate, 2-12×0.8-4.5 cm. Inflorescences densely glandular pilose, villous; verticillasters 6-12-flowered. Pedicel 2-8 mm. Calyx tubular, 6-13 mm, densely glandular pilose, villous, throat white hirsute; upper lip broadly triangular, 1.5-3×4-6 mm, apex acute; lower lip as long as upper, teeth narrowly triangular. Corolla yellow or yellowish, 2-2.8 cm, pubescent; tube obliquely pilose annulate, white pilose at throat, 0.8-1.5 cm, gradually dilated apically; upper lip falcate; lower lip shorter, middle lobe flabellate, 1.5-3×4-6 mm, constricted at base, margin irregularly dentate; lateral lobes 1-2×2-3 mm. Filaments 3-5 mm; connectives slightly curved, 2-2.5 mm, upper arms 1-1.7 mm, lower arms 0.5-1.2 mm; lower anther cells sterile, apex united. Nutlets yellow-brown, ellipsoid, 0.8-1.2 mm, ca. 0.5 mm in diam. Fl. and fr. May-Jun.

- Hillsides, margins of thicket; 600-1100 m. Anhui.

51. *Salvia sinica* Migo, J. Shanghai Sci. Inst. 3: 226. 1937.

浙皖丹参 zhe wan dan shen

Salvia sinica f. *purpurea* H. W. Li.

Plants perennial. Stems 1 to few, erect, 50-100 cm tall, herbaceous, branched toward apex, pilose, spreading or retrorse tawny pilose. Stem leaves 1-pinnate, narrowly ovate, to 30×15-20 cm; petiole to 10 cm, densely pilose, ± clasping, petiolules short to ± absent; leaflets (3-)7, minutely hispid, hirsute on veins, margin crenate; terminal leaflet ovate to oblong-lanceolate, to 12×5 cm. Verticillasters 5-12-flowered, in terminal racemes; rachis densely glandular hirtellous; bracts sessile, lanceolate to narrowly ovate, 3-8×1-2 mm, minutely hispid, base cuneate, margin entire, apex acute. Pedicel 3-5 mm, purple. Calyx campanulate, 7-8×ca. 5 mm in flower, 1-1.1 cm×7 mm after anthesis, glandular pilose, white pilose annulate inside; upper lip triangular, reflexed; teeth of lower lip triangular. Corolla tawny, purplish or purple on upper lip 1.6-2.2 cm, glandular; tube obliquely pilose annulate inside; upper lip falcate, 0.9-1.1 cm; lower lip 6-9 mm, middle lobe obovate to subrhombic, ca. 2×3 mm, lobules lacerate-dentate; lateral lobes obliquely oblong, 2-4 mm, apex rounded. Filaments ca. 4 mm; upper arms ca. 1.3 cm; lower arms ca. 4 mm, sterile, apex united. Style filiform, much exserted. Nutlets yellow-brown, ± fusiform, triquetrous, apex acute, ca. 3×1-1.3 mm. Fl. Jun.

- Hills. Anhui, Zhejiang.

52. *Salvia paramiltiorrhiza* H. W. Li & X. L. Huang, Acta Phytotax. Sin. 19: 245. 1981.

拟丹参 ni dan shen

Salvia miltiorrhiza Bunge var. *hupehensis* E. Peter; *S. paramiltiorrhiza* f. *purpureorubra* H. W. Li.

Plants perennial. Rhizome prostrate, ca. 1 cm in diam. Stems 1 to few, tufted, erect, 50-100 cm, branched toward apex, retrorse pilose. Petiole 1-6.5 cm, pilose, terminal petiolule 2-4.3 cm, lateral petiolules 5-12 mm; stem leaves (3-)5(-7)-foliolate; leaflets ovate, 1.3-7.5×0.9-3.5 cm, pilose to subglabrous, margin crenate. Inflorescence glandular pilose; verticillasters 4-6-flowered, widely spaced. Pedicel 4(-6) mm. Calyx tubular, 1-1.4 cm, glandular pilose, throat densely white hirsute; upper lip triangular, ca. 3×4 mm; lower lip nearly as long as upper, teeth triangular, apex acute. Corolla yellowish, yellow, to purple-red, 2-2.5 cm, sparsely glandular pilose, densely glandular pilose on upper lip; tube villous inside, slightly exserted, ca. 12×3 mm wide at base, 6-7(-8) mm wide at throat; upper lip folded-falcate, nearly at a right angle to lower lip; lower lip spreading, oblong, ca. 12×6 mm; middle lobe ca. 4×6 mm; lateral lobes ovate, ca. 2 mm wide. Connectives ca. 1.8 cm wide, semicircular-arcuate, glabrous, upper arms ca. 3×as long as lower. Nutlets dark brown, ellipsoid, ca. 2.5 mm. Fl. Jul-Sep.

- Hillsides, streamsides. Anhui, Hubei.

53. *Salvia vasta* H. W. Li, Bull. Bot. Res. 3: 67. 1983.

野丹参 ye dan shen

Plants perennial. Rhizome prostrate. Stems erect, 30-40(-100) cm, pubescent, becoming subglabrous, purplish. Leaves pinnate, 10-20 cm, 5-7-foliolate; petiole 4.5-11 cm; terminal leaflet broadly ovate to ovate-elliptic, 3-6.5×1.8-3.5 cm, abaxially glabrous, pubescent on veins, base rounded to shallowly cordate, margin serrate, apex long acuminate; lateral leaflets smaller, base oblique. Inflorescences glandular pilose; verticillasters (2-)4-8-flowered, widely spaced, in terminal racemes or panicles 15-35 cm. Pedicel ca. 4 mm. Calyx tubular, ca. 9 mm, pilose, puberulent mainly toward base, white hirsute on throat, 2-lipped to 1/4 its length; upper lip broadly triangular, ca. 3×5 mm; lower lip larger, triangular, ca. 4×5 mm, teeth narrowly triangular. Corolla yellow or purple, to 2.5 cm, pilose; tube much exserted, to 1.5 cm, ca. 2 mm wide at base, to 6 mm wide at throat, not hairy annulate inside; upper lip folded-falcate, ca. 12×4 mm, nearly at a right angle to lower lip; lower lip spreading, oblong, ca. 8×6 mm; middle lobe obcordate, ca. 4×5 mm. Filaments ca. 4 mm; anthers ca. 5 mm, connectives ca. 1.4 cm, upper arms ca. 1 cm, lower arms ca. 4 mm. Nutlets brownish, ellipsoid, ca. 2.5 mm, apex slightly pubescent. Fl. May-Jun, fr. Jul.

- Field margins, hillsides. Hubei.

- 1a. Margin of middle lobe of lower corolla lip entire or undulate 53a. var. *vasta*
- 1b. Margin of middle lobe of lower corolla lip fringed-denticulate 53b. var. *fimbriata*

53a. *Salvia vasta* var. *vasta*

野丹参 ye dan shen

Salvia vasta var. *vasta* f. *purpurea* H. W. Li.

Margin of middle lobe of lower corolla lip entire or undulate.

- Field margins. Hubei.

53b. *Salvia vasta* var. *fimbriata* H. W. Li, Bull. Bot. Res. 3: 70. 1983.

齿唇丹参 chi chun dan shen

Margin of middle lobe of lower corolla lip fimbriate-denticulate.

- Hillsides. Hubei.

54. *Salvia prionitis* Hance, J. Bot. 8: 74. 1870.

红根草 hong gen cao

Salvia japonica Thunberg var. *prionitis* (Hance) Kudô.

Herbs annual. Stems erect, 20–43 cm, densely white hirsute, unbranched or few branched. Leaves mostly basal, simple or ternate compound; petiole 1.5–6 cm; leaf blades of simple leaves oblong to ovate-lanceolate, 2.5–7.5×1.3–4.5 cm, adaxially hirsute, abaxially glabrous, hirsute on veins, base rounded to cordate, margin coarsely crenate; terminal leaflet ovate-elliptic, to 9 cm×5 mm, lateral leaflets ovate. Verticillasters 6–14-flowered, widely spaced, in racemes or panicles; bracts lanceolate, to 2 mm. Pedicel 1–2 mm, curved downward, densely pubescent. Calyx campanulate, purplish, ca. 4 mm, glandular pilose, throat hirsute annulate; upper lip triangular, less than ca. 1×2 mm; lower lip ca. 1×3 mm, teeth triangular, apex acute. Corolla violet, slightly puberulent; tube imperfectly fine pilose annulate inside, cylindrical, ca. 5.5 mm; upper lip oblong, ca. 4.5×2.1 mm; middle lobe of lower lip ca. 2×to 6 mm, undulate; lateral lobes ovate, 1–1.5 mm wide. Filaments ca. 3 mm; connectives ca. 5 mm, upper arms ca. 3.5 mm, slightly curved, lower arms short, apex united. Style exerted, ca. 1.3 cm. Nutlets brownish, ellipsoid, ca. 1.3×0.7 mm. Fl. Jun-Aug.

- Hillsides, grassy places; 100–800 m. Anhui, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

Used medicinally.

55. *Salvia cavaleriei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 8: 422. 1910.

贵州鼠尾草 gui zhou shu wei cao

Herbs. Taproot robust, short. Stems 12–32 cm, slender, often violet, glabrous toward base. Basal and lower stem leaves simple to 2-pinnate; petiole 1–7 cm; terminal leaflet narrowly ovate to lanceolate, 2.5–7.5×1–3.2 cm, adaxially puberulent or glabrous, abaxially purple, glabrous, base cuneate to rounded, margin remotely obtuse serrate, apex obtuse to rounded; lateral leaflets 1–3-paired; upper stem leaves simple or ternate. Inflorescences slightly puberulent; verticillasters 2–6-flowered, widely spaced, in terminal racemes or panicles; bracts purplish, lanceolate, ca. 2 mm, subglabrous. Pedicel ca. 2 mm. Calyx tubular, ca. 4.5 mm, glabrous, 2-lipped to ca. 1/4 its length, apically fine strigose inside; upper lip entire, apex acute; lower lip longer than upper. Corolla blue-purple to purple-red or white, ca. 8 mm, puberulent; tube pilose annulate inside, ca. 5.5 mm, gradually dilated from base, ca. 2 mm wide at throat; lips subequal, lower to ca. 4 mm wide. Filaments ca. 2 mm; connectives ca. 4.5 mm, upper arms ca. 3 mm, lower arms ca. 0.5 mm. Nutlets black, narrowly ellipsoid, ca. 0.8 mm. Fl. Jul-Sep.

- Hillsides, streamsides, forests; 500–2700 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan.

- 1a. Leaves simple, cordate-ovate, or cordate-triangular, rarely in 3s; petiole longer than blade; corolla purple or purple-red 55c. var. *simplicifolia*
- 1b. Leaves 1- or 2-pinnate, occasionally simple; petiole shorter than to as long as blade; corolla

blue-purple, dark purple, purple, or white.

- 2a. Leaves basal and on stem, pinnate; lower stem leaves simple or ternate, remotely obtuse serrate; petiole glabrous; corolla blue-purple or purple 55a. var. *cavaleriei*
- 2b. Leaves mostly basal, 1- or 2-pinnate, rarely simple, coarsely crenate or crenate-dentate; petiole spreading pilose; corolla dark purple or white 55b. var. *erythrophylla*

55a. *Salvia cavaleriei* var. *cavaleriei*

贵州鼠尾草 gui zhou shu wei cao

Salvia betonicoides H. Léveillé; *S. marchandii* H. Léveillé.

Basal and lower stem leaves 1-pinnately compound, upper stem leaves simple or ternate; petiole glabrous; blade adaxially puberulent, abaxially glabrous, margin remotely obtuse serrate. Corolla blue-purple or purple.

- Rocky hillsides, streamsides in forests; 500–1300 m. Guangdong, Guangxi, Guizhou, Sichuan.

55b. *Salvia cavaleriei* var. *erythrophylla* (Hemsley) E. Peter, Acta Horti Gothob. 10: 60. 1935.

紫背变种 zi bei bian zhong

Salvia japonica Thunberg var. *erythrophylla* Hemsley, J. Linn. Soc., Bot. 26: 284. 1890; *S. japonica* f. *erythrophylla* (Hemsley) Kudô.

Leaves mostly basal, 1- or 2-pinnately compound, occasionally simple; petiole shorter than blade, patent pilose; blade pilose, rarely subglabrous, margin remotely obtuse crenate or crenate-dentate, abaxially purple. Corolla dark purple or white.

- Grassy hills, forests; 700–2000 m. Guangxi, Hubei, Hunan, Shaanxi, Yunnan.

55c. *Salvia cavaleriei* var. *simplicifolia* E. Peter, Acta Horti Gothob. 10: 61. 1935.

血盆草 xue pen cao

Salvia delavayi H. Léveillé; *S. tsaiana* E. Peter.

Leaves mostly basal, rarely ternate; petiole longer than blade, glabrous or patent pilose; blade 3.5–10.5×1.8–5.3 cm, glabrous or pilose, margin crenate, apex acute to obtuse, lateral leaflets small. Inflorescence finely appressed pilose, not glandular hairy. Corolla purple or purple-red.

- Hillsides, streamsides in forests; 500–2700 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

56. *Salvia nubicola* Wallich ex Sweet, Brit. Fl. Gard. 2: t. 140. 1826.

云生丹参 yun sheng dan shen

Plants perennial. Stems erect, 1–1.25 m. Petiole as long as to longer than blades, densely pubescent; leaf blade triangular-ovate, sparsely villous or glabrous, appressed hairy on veins, base hastate-sagittate. Inflorescences densely glandular pubescent; verticillasters 6-flowered, widely spaced, 10–12 in terminal racemes or panicles; bracts sessile, ovate to elliptic, shorter than calyx, reflexed, abaxially fine pubescent, glandular hairy, apex long acuminate; lower bracts smaller than stem leaves, 2–4 cm. Pedicel 5–6 mm. Calyx 1–1.2 cm,

pubescent, long glandular hairy, minutely hispid inside, sparsely hairy at base; upper lip semicircular, shorter than lower, apex short 3-dentate; lower lip deeply 2-toothed. Corolla yellow with brown markings on lower lip, finely striate or spotted on limb, 3–4 cm; tube exerted, glandular hairy outside, finely hairy inside; upper lip falcate, glandular pubescent; middle lobe of lower lip broadly obovate, slightly shorter than lateral lobes, margin revolute, strongly dentate; lateral lobes transversely elliptic-oblong, revolute. Filaments shorter than connectives, upper arms 2–3× as long as lower arms; upper anther cells to 1 cm, lower cells deformed, semicircular, united. Nutlets brown, black reticulate, ellipsoid, ca. 3 mm, Fl. Jun–Aug (specimens not seen).

Xizang [Afghanistan, Bhutan, India, Pakistan; SW Asia, Europe].

Easily recognized by the hastate-sagittate leaf bases and yellow corollas.

57. *Salvia honania* L. Bailey, Gentes Herb. 1: 43. 1920.

河南鼠尾草 he nan shu wei cao

Herbs annual or biennial. Stems erect, 40–55 cm, densely glandular villous. Leaves simple or 3-foliolate; petiole 3–11 cm, sheathed at base; petiolules 1–4.3 cm, densely glandular villous; blades of simple leaves ovate, 5–7×4–5.5 cm, villous or pilose, ciliate, base cordate, margin coarsely serrate or crenate-serrate, apex acuminate to obtuse, terminal leaflet 5–10.5×4.5–8 cm. Inflorescences densely glandular villous; verticillasters 5–9-flowered, widely spaced, in terminal racemes or panicles; bracts lanceolate or spatulate, villous, glandular hairy. Pedicel 2–6 mm. Calyx tubular, 7–8 mm, glandular villous, throat white villous annulate; upper lip triangular, ca. 1.7×3.4 mm, margin entire or subentire, ciliate; lower lip larger than upper, teeth triangular. Corolla exerted, pubescent above middle; tube hairy annulate inside, 6–7 mm; upper lip oblong, ca. 4.7 mm; middle lobe of lower lip narrowed at base, apex enlarged, 2-lobulate, lobules fringed; lateral lobes ovate. Stamens exerted; filaments ca. 1 cm; connectives linear, ca. 1.4 cm, upper arms ca. 1 cm; lower anther cells undeveloped. Nutlets oblong-ellipsoid. Fl. May.

- Fields, wet open areas. Henan, Hubei.

58. *Salvia meiliensis* S. W. Su, Acta Bot. Yunnan. 6: 59. 1984.

美丽鼠尾草 mei li shu wei cao

Plants perennial. Stems erect, 30–50 cm, densely retrorse white villous, glandular hairy. Leaves 3–5-foliolate; petiole 4–13 cm, terminal petiolule (1–)2–4 cm, lateral petiolules 0.1–1(–2) cm, glandular pilose; terminal leaflet broadly ovate, (2.5–)6–11×(2–)5–7 cm, white strigose, abaxially sometimes purple-green, base cordate to subcordate, margin irregularly crenulate, pilose, apex acute; lateral leaflets 1–2 (–4.5)×0.8–1.5(–3) cm. Verticillasters 8- to many flowered, widely spaced, in racemes or panicles, glandular hairy. Pedicel 2–4 mm, pubescent. Calyx tubular, 6.5–7 mm, glandular pilose; upper lip obtusely triangular, ca. 1×3–3.5 mm; lower lip ca. 1.5 mm, teeth triangular. Corolla yellowish, 1.5–1.6 cm, apex pubescent outside; tube tubular, somewhat exerted, 6–7(–8) mm, ca. 1.5 mm wide at base, ca. 3.5 mm wide at throat, pilose annulate at middle; upper lip oblong lanceolate, 5–6(–7)×ca. 2 mm; lower lip spreading, 8–9×4 mm; middle lobe ca. 7.5×4–6 mm, base attenuate, gradually wider toward apex, strongly 2-lobulate, Y-shaped. Filaments ca. 2 mm; anthers ca.

2.5 mm, connectives ca. 1.6 cm, wider, upper arms ca. 1.1 cm, lower arms abortive. Nutlets dark brown, oblong, ca. 2 mm. Fl. May–Jun.

- Roadsides; 1000–1300 m. Anhui (Yuexi Xian).

59. *Salvia plectranthoides* Griffith, Not. Pl. Asiat. 4: 199. 1854.

长冠鼠尾草 chang guan shu wei cao

Salvia japonica Thunberg var. *gracillima* Diels; *S. japonica* var. *kaiscianensis* Pampanini; *S. japonica* var. *parvifoliola* Hemsley; *S. pinnata* Pavolini; *S. tuberifera* H. Léveillé.

Plants annual or biennial. Stems 1 to few, erect or ascending, spreading pilose. Leaves ternate to 5–7-foliolate or 2-pinnate; petiole slightly shorter to longer than blade; leaflets ovate to lanceolate, 0.5–5× to 5 cm, abaxially purplish, glandular, base broadly cuneate to rounded, margin crenate or crenate-dentate, apex acuminate to rounded. Inflorescences densely glandular pilose; verticillasters (2–)5–7-flowered, widely spaced, in elongated racemes or panicles; bracts lanceolate, to 2 mm. Pedicel 1–2 mm. Calyx campanulate-tubular, 5–8 mm in flower, 2-lipped to ca. 1/4 its length, yellowish glandular, veins glandular pubescent; upper lip semicircular, ca. 1.5×2.5 mm, margin entire; lower lip ca. 1.5 mm, to 3 mm wide, deeply 2-toothed; fruiting calyx 7–11 mm, glabrescent. Corolla red to purplish or purple-blue, rarely white, 1.1–2 cm, finely pilose; tube tubular, 2–3× as long as calyx, slightly dilated at apex; upper lip straight, ca. 3×1.8 mm; lower lip dilated, somewhat longer than upper lip, middle lobe obcordate, lateral lobes subcircular. Filaments 2–3 mm; connectives suberect, 3–4 mm, upper arms longer than lower. Nutlets brownish, blackish brown on midvein, oblong, ca. 2.5 mm, adaxially ribbed, rounded. Fl. May–Aug.

Hillsides, streamsides in valleys, sparse forests; 800–2500 m. Guangxi, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan [Bhutan, India (Sikkim)].

Used medicinally.

60. *Salvia brevicnectivata* Sun, Fl. Yunnan. 1: 686. 1977.

短隔鼠尾草 duan ge shu wei cao

Herbs annual or perennial. Stems erect, ca. 35 cm, retrorse fine pilose. Basal leaves simple; petiole 7–9 cm; leaf blade ovate, 5–6×4–5 cm, glabrous, abaxially sparsely fine pilose on veins, base cordate, margin coarsely crenate, apex obtuse to rounded; stem leaves odd-pinnate, 10–15×5.5–7 cm; petiole 4–7 cm; leaflets 5–7, ovate to circular-ovate, 2–4×1–3 cm, base rounded or shallowly cordate, margin irregularly obtusely serrate, apex obtuse; terminal leaflet larger. Inflorescences densely pilose; verticillasters 2–6-flowered, widely spaced, in terminal racemes 8–15 cm; bracts lanceolate, ca. 1.5 mm. Pedicel ca. 3 mm. Calyx tubular, ca. 7 mm, pilose, glabrous near base inside, 2-lipped to ca. 1/4 its length; upper lip triangular, ca. 2×3 mm, margin entire, apex acute; lower lip slightly longer than upper, 2-cleft, teeth triangular. Corolla reddish, ca. 1.1 cm, pubescent, glabrous inside; tube to 8 mm, straight, ca. 1.5 mm wide at throat; upper lip oblong, ca. 3×2 mm, apex emarginate; lower lip ca. 3×4 mm, middle lobe obcordate, ca. 2×2 mm. Filaments ca. 1.3 mm; connectives ca. 0.3 mm, arms subequal. Nutlets

green-yellow, narrowly ellipsoid, ca. 3 mm. Fl. and fr. Jan-Feb.

- Roadsides; 1800 m. Yunnan (Lunan Xian).

Distinguished in the original diagnosis from the previous species by the smaller corollas scarcely 2× as long as calyx.

61. *Salvia nanchuanensis* Sun, Fl. Reipubl. Popularis Sin. 66: 582. 1977.

南川鼠尾草 *nan chuan shu wei cao*

Herbs annual or biennial. Stems 1 to few, erect, 20–65 cm, unbranched, densely spreading white lanate. Stem leaves, 1–4-pinnate; petiole 1.5–5.5 cm, petiolules 2–7 mm; leaflets ovate to lanceolate, 2–6.5×0.7–2.3 cm, adaxially glabrous, abaxially green-purple, villous on veins, margin crenate or serrate; terminal leaflet linear to ovate. Inflorescences glandular pilose; verticillasters 2–6-flowered, in terminal and axillary racemes 6–15 cm or panicles to 25 cm; bracts lanceolate, 1–3 mm, apex acuminate, ciliate. Pedicel ca. 3 mm. Calyx dark purple, tubular, 5–7 mm, glandular white pilose along veins, white hirsute on throat; upper lip triangular, ca. 1×4.5 mm; lower lip longer than adaxial, ca. 2×3 mm, teeth narrowly triangular; fruiting calyx 6–8 mm. Corolla purple-red, 0.9–3 cm, long tubular, pilose; tube to 2.5 cm, straight, ca. 2 mm wide at base, slightly dilated at throat; upper lip oblong, ca. 5×3 mm; lower lip ca. 5×7 mm, middle lobe broadly obcordate, lateral lobes semicircular. Filaments ca. 2 mm; connectives ca. 3.5 mm, upper arms slightly longer than abaxial. Nutlets brown, ellipsoid, ca. 2 mm. Fl. Jul-Aug.

- Riverbanks, rocky slopes, open areas; 1700–1800 m. Hubei, Sichuan.

Close to *Salvia plectranthoides*; separated from it in the original diagnosis by the hirsute annulus of the calyx tube and the spreading white lanate stems.

- 1a. Leaves 3- or 4-pinnate, terminal leaflets or lobules linear 61b. var. *pteridifolia*
- 1b. Leaves 1- (or 2)-pinnate, terminal leaflets ovate to lanceolate 61a. var. *nanchuanensis*

61a. *Salvia nanchuanensis* var. *nanchuanensis*

南川鼠尾草 *nan chuan shu wei cao*

S. nanchuanensis f. *intermedia* Sun.

Leaves 1- (or 2)-pinnately compound, terminal leaflets ovate to lanceolate.

- Rocky riverbanks, open areas; 1700–1800 m. Hubei, Sichuan.

61b. *Salvia nanchuanensis* var. *pteridifolia* Sun, Fl. Reipubl. Popularis Sin. 66: 583. 1977.

蕨叶变种 *jue ye bian zhong*

Leaves 3- or 4-pinnately compound, terminal leaflets or lobules linear.

- Wet rocky slopes. Sichuan.

62. *Salvia grandifolia* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 123. 1916.

大叶鼠尾草 *da ye shu wei cao*

Plants perennial. Stems erect, ca. 1.5 m, robust, densely glandular hispid, much branched. Petiole 7 cm to obsolete, densely rusty tomentose-villous; leaf blade obovate, to 35×25 cm, papery, sparsely villous, base rounded to broadly cuneate,

margin remotely deep undulate-lobulate; lobes rounded, ca. 4 mm wide, apex rounded. Inflorescences densely glandular pilose; verticillasters 2-flowered, widely spaced, forming much-branched terminal panicles; bracts ovate, acuminate, base rounded, to ca. 5 mm. Pedicel 1–5 mm. Calyx campanulate, 1.3–1.7 cm, glandular pubescent, sparsely red-brown glandular, tube 8–10 mm; upper lip shallowly 3-toothed, middle tooth smaller than lateral; lower lip slightly longer than upper, deeply 2-toothed, teeth triangular. Corolla purple-red except yellowish at base, ca. 2.4(–3) cm; tube straight, nearly exerted, gradually dilated upward, apex glandular pilose, without hairy annulus inside; upper lip oblong, ca. 5×4 mm, slightly falcate, densely glandular pilose, lower lip as long as upper, to 1 cm wide; middle lobe obcordate, ca. 4×5 mm; lateral lobes ovate, ca. 3 mm wide. Filaments ca. 4 mm; connectives nearly straight, ca. 1 cm, lower arms shorter than upper. Nutlets brown, ovoid, ca. 4 mm. Fl. and fr. Oct.

- Gorges; 2000–3000 m. Sichuan, Yunnan.

63. *Salvia deserta* Schangin, Bot. Gart. Dorpat., Suppl. 2, 6. 1824.

新疆鼠尾草 *xin jiang shu wei cao*

Plants perennial. Stems erect, to 70 cm, pilose, puberulent. Petiole 0–4 cm; leaf blade ovate to lanceolate-ovate, 4–9×1.5–5 cm, adaxially bullate, scabrous, abaxially pubescent, base cordate, margin irregularly crenate-serrate, apex acute to acuminate. Inflorescences densely puberulent; verticillasters 4–6-flowered, in elongated terminal racemes or panicles; bracts broadly ovate, purple-red, 4–6 mm, base rounded, margin entire, apex caudate-acuminate to acuminate. Pedicel ca. 1.5 mm. Calyx ovoid-campanulate, 5–6 mm, sparsely yellow-brown glandular, finely pilose on veins, 2-lipped to ca. 1/3 its length; upper lip semicircular, ca. 1.5×4 mm, apex 3-denticulate; middle tooth smaller, slightly reflexed; lower lip longer than upper, ca. 3×4 mm, deeply 2-toothed, teeth narrow triangular. Corolla blue-purple to purple, 9–10 mm, finely pilose, yellow-brown glandular; tube ca. 8 mm, ca. 2 mm wide at base, ca. 3 mm wide at throat, straight; upper lip elliptic, ca. 5×3.5 mm; lower lip subcircular, ca. 5×6.5 mm, margin undulate; lateral lobes elliptic, ca. 2 mm wide. Filaments ca. 2 mm; connectives ca. 6.5 mm, upper arms ca. 4.5 mm, lower arms ca. 2 mm. Nutlets black, obovoid, ca. 1.5 mm. Fl. and fr. Jun-Oct.

Waste places, sandy grasslands, streamsides in forests; 300–1800 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia].

A very close relative of the Eurasian *Salvia nemerosa* Linnaeus; the purple-red bracts are distinctive.

64. *Salvia plebeia* R. Brown, Prodr. 501. 1810.

荔枝草 *li zhi cao*

Lumnitzera fastigiata Roth Sprengel; *Ocimum fastigiatum* Roth; *O. virgatum* Thunberg; *Salvia brachiata* Roxburgh; *S. minutiflora* Bunge; *S. plebeia* var. *latifolia* E. Peter.

Herbs annual or biennial. Stems erect, 15–90 cm, robust, much branched, retrorse gray pilose. Petiole 4–15 mm; leaf blade elliptic-ovate to elliptic-lanceolate, 2–6×0.8–2.5 cm, adaxially sparsely minutely hispid, abaxially finely pilose, sparsely yellow-brown glandular, base rounded to cuneate, margin crenate, dentate, or serrate, apex obtuse to acute.

Inflorescences densely pilose; verticillasters 6-flowered, numerous, in racemes or panicles 10–25 cm; bracts lanceolate. Pedicel ca. 1 mm. Calyx campanulate, ca. 2.7 mm, pilose, sparsely yellow-brown glandular, 2-lipped to 1/3 its length; upper lip 3-denticulate; lower lip deeply 2-toothed, teeth triangular. Corolla reddish, purplish, purple, blue-purple, to blue, rarely white, ca. 4.5 mm; tube glabrous, hairy annulate inside; upper lip oblong, ca. 1.8×1 mm, densely puberulent; lower lip ca. 1.7×1 mm, middle lobe broadly obovate. Stamens slightly exerted; filaments ca. 1.5 mm; connectives ca. 1.5 mm, arcuate, arms subequal. Nutlets obovoid, ca. 0.4 mm in diam. Fl. Apr-May, fr. Jun-Jul.

Hillsides, streamsides, wet fields; 0–2800 m. In every province except Gansu, Qinghai, Xinjiang, Xizang [Afghanistan, India, Indonesia, Japan, Korea, Malaysia, Myanmar, Russia, Thailand, Vietnam; Australia].

Used as a folk medicine. Easily recognized by the very small flowers.

65. *Salvia splendens* Ker Gawler, Bot. Reg. 8: t. 687. 1822.

一串红 *yi chuan hong*

Herbs suffruticose, to 90 cm tall. Petiole 3–4.5 cm, glabrous; leaf blade ovate to triangular-ovate, 2.5–7×2–4.5 cm, glabrous, abaxially glandular, base truncate or ± rounded, margin serrate, apex acuminate. Verticillasters 2–6-flowered, in racemes to 20 cm; bracts ovate, red, enveloping flowers in bud, apex caudate-acuminate. Pedicel 4–7 mm, red glandular villous. Calyx red, campanulate, ca. 1.6 cm in flower, dilated to 2 cm after anthesis, red glandular, veins villous, 2-lipped to ca. 1/3 its length; upper lip triangular-ovate, 5–6×10 mm, apex mucronate; lower lip slightly longer than upper, deeply 2-toothed, teeth triangular. Corolla scarlet, 4–4.2 cm, pubescent; tube slightly dilated at throat; upper lip straight, somewhat concave, oblong, 8–9×ca. 4 mm; lower lip shorter than upper. Filaments ca. 5 mm; connectives ca. 1.3 cm. Nutlets dark brown, ellipsoid, ca. 3.5 mm, apex irregularly plicated, margin (or midvein) narrowly winged. Fl. Mar-Oct.

Cultivated in China [South America].

The corolla is purple or even white in different varieties.

66. *Salvia coccinea* Buc'hoz ex Etlinger, De *Salvia* 23. 1777.

朱唇 *zhu chun*

Herbs annual or biennial. Stems erect, to 70 cm, spreading hirsute, retrorse gray pilose. Petiole 0.5–2 cm; leaf blade ovate to triangular-ovate, 2–5×1.5–4 cm, abaxially gray minutely tomentose, base cordate to subtruncate, margin serrate or obtusely serrate, apex acute. Inflorescences densely, retrorse fine white pilose; verticillasters 4- to many flowered, widely spaced, in terminal racemes; bracts ovate, longer than pedicels, margin ciliate. Pedicel 2–3 mm. Calyx tubular-campanulate, 7–9 mm, finely pilose, puberulent, intermixed with yellowish glands; upper lip ovate, ca. 2.5×3 mm, ciliolate, apex mucronate; lower lip nearly as long as upper, deeply 2-toothed. Corolla scarlet or deep red, 2–2.3 cm, pubescent; tube ca. 1.6 cm; upper lip shorter than lower; lower lip ca. 7×8.5 mm. Stamens exerted; filaments ca. 4 mm; connectives ca. 1.5 mm, slender. Nutlets yellow-brown with blackish spots, obovoid, 1.5–2.5 mm. Fl. Apr-Jul.

Cultivated in China and naturalized in Yunnan [South America].

Used as an ornamental and medicinally.

67. *Salvia liguliloba* Sun, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 10: 29. 1935.

舌瓣鼠尾草 *she ban shu wei cao*

Herbs annual. Stems purple-green, erect, 30–40(–70) cm, striate, finely pilose on angles. Petiole 2–3 cm; basal leaf blades oblong, 2–4.5×1.2–3 cm, abaxially purple, glabrous, veins pubescent, base cordate, margin crenulate-serrulate, apex obtuse; stem leaves ca. 3-paired, blade lanceolate, 3–7(–11)×1–2.2(–4.2) cm. Inflorescences glandular villous; verticillasters 2–12-flowered, widely spaced, in second, terminal racemes; bracts linear-lanceolate, ca. 5×0.5 mm. Pedicel ca. 2.5 mm. Calyx campanulate, ca. 7 mm, villous; upper lip triangular, ca. 2×3 mm; lower lip nearly as long as upper, 2-cleft, teeth triangular. Corolla reddish, pilose especially on lips outside; tube conspicuously pilose annulate near base inside, ca. 1.8 cm, gradually dilated upward, to 6 mm wide at throat; upper lip straight, oblong, ca. 4×3 mm; lower lip ca. 4.5×8 mm, middle lobe ligulate, narrowly elliptic, margin entire, ca. 2×1.5 mm; lateral lobes larger than middle, triangular, ca. 2×4 mm. Filaments ca. 2 mm; connectives ca. 4.5 mm, upper arms ca. 2.5 mm. Nutlets brown, ellipsoid, ca. 2×0.8 mm. Fl. Jun.

• Hillside forests; 800 m. Anhui, Zhejiang.

68. *Salvia chienii* E. Peter, Acta Horti Gothob. 10: 62. 1935.

黄山鼠尾草 *huang shan shu wei cao*

Plants rhizomatous, perennial. Stems erect, 20–45 cm, glabrous or densely retrorse pilose. Leaves simple and compound; petiole 1.5–6 cm, petiolules 1–3 mm; leaflets 3, terminal largest, ovate to ovate-lanceolate, 4–14×1.2–4 cm, margin crenate or obtusely serrate, apex acute to acuminate; lateral leaflets 1–4×0.8–2.5 cm; simple leaves sessile, on stem, ovate-lanceolate, 1.5–5.5×0.5–2.5 cm, similar to leaflets. Verticillasters 3–7-flowered, widely spaced, in terminal or axillary second racemes or panicles; bracts lanceolate, ca. 5 mm. Calyx tubular, ca. 6 mm, purple-red, finely glandular pilose; tube ca. 4.5 mm, apex purple-red inside; upper lip broadly triangular, margin entire, 3-veined; teeth triangular, apex acute. Corolla 1–1.3 cm, purple, pubescent; tube obliquely hairy annulate near base, bearded in front at throat inside, ca. 9 mm, straight, gradually dilated to 3 mm wide at throat; upper lip oblong, ca. 2.5×2 mm; lower lip longer than upper, ca. 3×4 mm; middle lobe semicircular to oblong, apex emarginate; lateral lobes oblong. Filaments ca. 1 mm; connectives ca. 2.5 mm, upper arms ca. 2 mm. Nutlets yellow-brown, ca. 2×1 mm. Fl. Jul.

• Hillsides, streamsides; 700 m. Anhui, Jiangxi.

- 1a. Stems, blades, and petioles fine pilose; corolla ca. 1 cm, middle lobe of lower lip semicircular to oblong 68a. var. *chienii*
- 1b. Stems, blades, and petioles glabrous; corolla ca. 1.3 cm, middle lobe of lower lip oblong 68b. var. *wuyuania*

68a. *Salvia chienii* var. *chienii*

黄山鼠尾草 *huang shan shu wei cao*

Salvia anhweiensis Migo.

Stems, blades, and petioles finely pilose. Corolla ca. 1 cm, middle lobe of lower lip semicircular to oblong.

- Hillsides. Anhui.

68b. *Salvia chienii* var. *wuyuania* Sun, Fl. Reipubl. Popularis Sin. 66: 583. 1977.

婺源变种 wu yuan bian zhong

Stems, blades, and petioles glabrous. Corolla ca. 1.3 cm, middle lobe of lower lip oblong.

- Streamsides; 700 m. Jiangxi.

69. *Salvia baimaensis* S. W. Su & Z. A. Shen, Acta Bot. Yunnan. 6: 57. 1984.

白马鼠尾草 bai ma shu wei cao

Plants perennial. Stems erect, few, 40–60 cm, densely retrorse pubescent and pilose. Leaves mostly simple, rarely lower stem leaves ternate; petiole of basal leaves 2–8 cm, petioles of lower stem leaves (0.5–)1–4.5 cm, sessile in upper ones; leaf blades of basal leaves ovate to oblong-ovate, 3–9.5×1.5–7 cm, abaxially glandular pubescent, margin irregularly crenulate; stem leaves (1-) or 2- or 3-paired, blade obovate to elliptic-obovate, (2.5–)4–13×2–8 cm. Verticillasters 6-flowered, widely spaced, in racemes or panicles to 30 cm; rachis densely retrorse white pubescent; bracts lanceolate, 3–10(–20)×1–1.5(–2) mm. Pedicel 2–3 mm, densely pubescent. Calyx green, tubular, 6–7 mm, sparsely pubescent on veins, yellowish glandular; upper lip semicircular-triangular, 0.5–1 mm, 3-denticulate; lower lip 1.5–2 mm, teeth triangular. Corolla white, reddish adaxially on middle lobe of lower lip, ca. 1.1 cm, pubescent or glandular pubescent; tube obliquely pilose annulate inside, ca. 8 mm, straight, 1.5–2 mm wide at base; upper lip ca. 2 mm; middle lobe of lower lip ca. 2×3.5–4 mm, obcordate; lateral lobes subcircular, ca. 1 mm. Stamens somewhat exerted; filaments ca. 0.7 mm; connectives slightly curved, ca. 3.5 mm, upper arms ca. 3 mm, lower arms very short. Nutlets unknown. Fl. May–Jun.

- Hillsides; 600–1400 m. Anhui (Jinzhai Xian).

70. *Salvia substolonifera* E. Peter, Acta Horti Gothob. 9: 138. 1934.

佛光草 fo guang cao

Plants annual. Stems ascending or trailing at base, 10–40 cm, pubescent or puberulent. Basal leaves mostly simple, stem leaves 3-lobed or ternate; petiole 0.6–6 cm, petiolules 1–4 mm; leaf or leaflet blades ovate, 1–3×0.8–2 cm, subglabrous or minutely hirsute on veins, margin crenate; terminal leaflet largest. Inflorescences densely hirtellous, glandular pilose; verticillasters 2–8-flowered, lower widely spaced, upper crowded, in axillary or terminal racemes or panicles 7–15 cm; bracts oblong ovate, 3–5 mm. Pedicel ca. 2 mm. Calyx campanulate, 3–4 mm in flower, to 7 mm in fruit, puberulent, glandular, subglabrous inside; upper lip trapeziform, somewhat longer than abaxial, teeth ovate-triangular. Corolla reddish or purplish, 5–7 mm, sparsely puberulent; tube with or without hairy annulus inside, slightly exerted, 3–4 mm, ca. 1 mm wide at base, dilated to ca. 2 mm wide at throat; upper lip suboblong or obovate, straight. Filaments ca. 1 mm; connectives less than 1 mm, arcuate;

arms equal. Nutlets brownish, ovoid, 1.5×0.7 mm, apex rounded, adaxially ribbed. Fl. Mar–May.

- Streamsides, rocky crevices, forests; 0–900 m. Fujian, Gui-zhou, Hunan, Sichuan, Zhejiang.

Used medicinally.

71. *Salvia scapiformis* Hance, J. Bot. 23: 368. 1885.

地埂鼠尾草 di geng shu wei cao

Plants herbaceous. Stems slender, 20–26 cm, sparsely appressed puberulent or subglabrous. Leaves basal or subbasal, rarely on stem, mostly simple, sometimes 2- or 3-foliolate; petiole 2.5–9 cm; leaf blade cordate-ovate, 2–4.3×1.3–3.6 cm, abaxially violet, glabrous, pubescent on veins, base cordate, margin undulate-crenate; terminal leaflets larger than lateral. Inflorescences puberulent; verticillasters 6–10-flowered, widely spaced, in terminal racemes or panicles 10–20 cm; bracts ovate-lanceolate, 2–5 mm. Pedicel ca. 1.5 mm. Calyx green, tubular, ca. 4.5 mm, abaxially tinged red when dry, subglabrous, sparsely yellowish glandular; upper lip semicircular-triangular, margin entire, apex mucronate; lower lip shallowly 2-toothed, teeth triangular. Corolla purple or white, ca. 7 mm, pubescent; tube finely pilose annulate inside, slightly exerted, ca. 0.8 mm wide, slightly dilated at throat; upper lip straight, lower lip longer. Stamens exerted; filaments ca. 1 mm; connectives 2–4 mm, upper arms ca. 1.5 mm, lower arms ca. 0.9 mm, without apical anther cells, separate. Nutlets brown, narrowly ovoid, ca. 1.3 mm, apex acute. Fl. Apr–May.

Hilltops, valleys, streamsides, waste areas, forests; 100–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Taiwan, Zhejiang [Philippines].

- 1a. Calyx 6–7 mm, campanulate, membranous, yellowish when dry; verticillasters crowded; leaves on stem 71b. var. *carphocalyx*
- 1b. Calyx ca. 4.5 mm, tubular, papery, green, abaxially tinged red when dry; verticillasters widely spaced; at least some leaves basal or subbasal.
 - 2a. Petioles sparsely spreading hirsute 71c. var. *hirsuta*
 - 2b. Petioles glabrous or sparsely puberulent 71a. var. *scapiformis*

71a. *Salvia scapiformis* var. *scapiformis*

地埂鼠尾草 di geng shu wei cao

Leaves mostly basal or subbasal, rarely on stem or basal and on stem; petiole glabrous or sparsely puberulent. Verticillasters remote. Calyx green, ca. 4.5 mm, tubular, papery, dorsally tinged red when dry.

Hilltops, valleys, forests. Fujian, Guangdong, Taiwan [Philippines].

71b. *Salvia scapiformis* var. *carphocalyx* E. Peter, Acta Horti Gothob. 10: 63. 1935.

钟萼变种 zhong e bian zhong

Leaves tufted toward stem base or inserted on procumbent stem. Verticillasters congested. Calyx 6–7 mm, campanulate, membranous, yellowish when dry.

- Streamsides in forests; 600–700 m. Guangdong, Hunan, Jiangxi.

71c. *Salvia scapiformis* var. *hirsuta* E. Peter, Acta Horti Gothob. 10: 63. 1935.

硬毛变种 ying mao bian zhong

Basal leaves numerous, stem leaves 2–4, simple or 3–5-foliolate; petiole sparsely patent hirsute; leaf blade cordate or ovate-lanceolate, apex rounded to subacute, subglabrous.

• Hills, waste areas near villages, sparse forests; 100–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Zhejiang.

72. *Salvia japonica* Thunberg, Syst. Veg., ed. 14, 72. 1784.

鼠尾草 shu wei cao

Plants annual. Stems erect, 40–60 cm, sparsely villous along angles or subglabrous. Leaves 1–3-pinnate; petiole 7–9 cm; leaf blade 6–13×5–9 cm; upper stem leaves 1-pinnate, short petiolate; terminal leaflet lanceolate or rhombic, to 10×3.5 cm, pilose or glabrous, base long cuneate, margin obtusely serrate; lateral leaflets subsessile, ovate-lanceolate, 1.5–5×0.8–2.5 cm, base obliquely rounded. Verticillasters 2–6-flowered, in terminal racemes or panicles; rachis densely glandular pilose or pilose; bracts and bracteoles lanceolate, 2–5×0.5–1 mm, glabrous, margin entire. Pedicel 1–1.5 mm, pubescent. Calyx tubular, 4–6 mm, sparsely glandular pilose, white hirsute annulate on throat inside, 2-lipped to ca. 1/3 its length; upper lip triangular or nearly semicircular, ca. 2×3 mm; teeth narrowly triangular, apex long acuminate. Corolla reddish, purplish, bluish, to white, ca. 1.2 cm, densely villous; tube obliquely pilose annulate inside, ca. 9 mm, exserted, ca. 2 mm wide at base, to 3.5 mm wide at throat; upper lip elliptic to ovate, ca. 2.5×2 mm; lower lip ca. 3×4 mm, margin crenulate. Stamens exserted; filaments ca. 1 mm; connectives ca. 6 mm, straight or slightly curved. Nutlets brown, ellipsoid, ca. 1.7×0.5 mm. Fl. Jun-Sep.

• Hillsides, grasslands, wet areas, riverbanks, thickets, forests; 200–1200 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

- 1a. Lower stem leaves 2- or 3-pinnately compound, leaflets numerous, variable; middle lobe of lower corolla lip 2-lobulate, lobules divaricate, conspicuously dentate 72b. var. *multifoliolata*
1b. Lower stem leaves 1- or 2-pinnately compound, leaflets few; middle lobe of lower corolla lip obcordate, apex emarginate, margin crenulate 72a. var. *japonica*

72a. *Salvia japonica* var. *japonica*

鼠尾草 shu wei cao

Salvia chinensis Benth. f. *alatopinnata* Matsumura & Kudô; *S. fortunei* Benth.; *S. japonica* f. *alatopinnata* (Matsumura & Kudô) Kudô; *S. japonica* var. *fortunei* (Benth.) Kudô; *S. japonica* var. *lanuginosa* (Franchet) E. Peter.; *S. japonica* var. *ternata* Franchet.

Lower stem leaves 1- or 2-pinnately compound, leaflets few. Middle lobe of lower corolla lip obcordate, margin crenulate, apex emarginate.

• Hillsides, shady grasslands, wet areas, forests; 200–1100 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Jiangsu, Jiangxi, Taiwan, Zhejiang.

72b. *Salvia japonica* var. *multifoliolata* E. Peter, Acta Horti Gothob. 10: 68. 1935.

多小叶变种 duo xiao ye bian zhong

Salvia szechuanica Yamazaki.

Lower stem leaves 2- or 3-pinnately compound, leaflets numerous, variable. Middle lobe of lower corolla lip 2-lobulate, lobules divaricate, conspicuously dentate.

• Grassy hillsides, riverbanks, thickets; 700–1200 m. Guangdong, Sichuan.

73. *Salvia chinensis* Benth. Labiat. Gen. Spec. 725. 1835.

华鼠尾草 hua shu wei cao

Salvia japonica Thunberg var. *chinensis* (Benth.) E. Peter; *S. japonica* var. *integrifolia* Franchet & Savatier; *S. tashiroi* Hayata.

Plants annual. Stems erect or prostrate at base, 20–60 cm, pubescent or villous. Leaves simple or 3-foliolate toward stem base; petiole 0.1–7 cm; leaf blade of simple leaves ovate to ovate-elliptic, 1.3–7×0.8–4.5 cm, subglabrous except for pubescent veins, base cordate to rounded, margin crenate or obtusely serrate; terminal leaflet 2.5–7.5 cm, petiolule 0.5–1.7 cm. Inflorescences pubescent; verticillasters 6-flowered, lower widely spaced, upper crowded, in pubescent terminal racemes or panicles 5–24 cm; bracts lanceolate, 2–8×0.8–2.3 mm. Pedicel 1.5–2 mm. Calyx campanulate, 4.5–6 mm, purple, veins villous, throat densely hirsute annulate; tube 4–4.5 mm; upper lip ± semicircular, ca. 1.5×3 mm, apex 3-mucronate; lower lip longer than upper, ca. 2×3 mm; teeth narrowly triangular, apex acuminate. Corolla blue-purple or purple, ca. 1 cm, exserted, pubescent; tube obliquely pilose annulate inside, ca. 6.5 mm, to 3 mm wide at throat; upper lip oblong, ca. 3.5×3.3 mm, spreading; lower lip ca. 5×7 mm, middle lobe obcordate, curved downward, ca. 4×7 mm, margin crenulate, apex emarginate; lateral lobes semicircular, ca. 1.3 mm wide. Stamens nearly exserted; filaments ca. 1.8 mm; connectives ca. 4.5 mm, upper arms ca. 3.5 mm. Nutlets brown, ellipsoid-ovoid, ca. 1.5×0.8 mm. Fl. Aug-Oct.

• Forests, tufts of grass on hillsides or plains; 100–500 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Zhejiang.

Used medicinally.

74. *Salvia chunganensis* C. Y. Wu & Y. C. Huang, Fl. Reipubl. Popularis Sin. 66: 584. 1977.

崇安鼠尾草 chong an shu wei cao

Herbs annual. Stems erect, 32–44 cm, purple, glabrous, subterete toward base. Stem leaves 3–5-foliolate; petiole 2–9(–10) cm, adaxially spreading villous, abaxially glabrous, petiolule 2–15 mm; leaflets ovate, 1.2–4×0.7–3 cm, lateral leaflets ± oblique, adaxially minutely hispid or subglabrous, abaxially subglabrous or pilose along veins, glandular, margin serrate. Verticillasters 2–6-flowered, 1–2.5 cm apart, in racemes or panicles to 19 cm; bracts lanceolate, lower much longer than flowers, gradually shorter upward to almost as long as pedicels, abaxially conspicuously glandular. Pedicel 2–3 mm, glandular pilose. Calyx campanulate, 5–6 mm, glandular pilose, with 2 rows of hairs on middle of upper lip inside, tube ca. 4.5 mm; upper lip triangular, ca. 1.5×2.5 mm; lower lip slightly longer than upper, ca. 1.8×2.5 mm, shallowly 2-toothed; teeth triangular, apex spinescent; fruiting

calyx slightly dilated. Corolla purplish blue or reddish white, 9–10 mm, glandular pilose; tube imperfectly pilose annulate inside, tubular, ca. 1 mm wide, gradually dilated to 2 mm wide at throat; upper lip nearly straight, oblong, ca. 3×2.2 mm; lower lip slightly longer than upper lip, lobes circular, subequal. Stamens exerted; filaments ca. 1.5 mm; connectives ca. 4 mm, upper arms ca. 3 mm. Nutlets brown, ellipsoid, ca. 1.8 mm, adaxially ribbed. Fl. and fr. Aug.

- Tufts of grass. Fujian (Chong'an Xian).

Related in the original description to *Salvia scapiformis*.

75. *Salvia adoxoides* C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 584. 1977.

五福花鼠尾草 wu fu hua shu wei cao

Plants perennial, rhizomatous. Stems ca. 11 cm, red, glandular pilose, sparsely so to glabrescent basally. Leaves mostly basal, 3–7-foliolate, finely minutely hirsute; stem leaves 1-paired, much reduced; petiole slender, 1–2.5 cm, petiolule 1–3 mm; leaflets subcircular to ovate, less than 9×8 mm, abaxially sparsely yellowish glandular, subglabrous or finely minutely hirsute, veins conspicuously elevated abaxially. Inflorescences densely glandular pilose; verticillasters 2-flowered, widely spaced; racemes to 9 cm, pedunculate; bracts narrowly ovate to lanceolate, densely glandular pilose. Pedicel 1–2 mm. Calyx campanulate, ca. 6.5 mm, veins glandular pilose; tube ca. 4 mm, throat hirsute annulate; upper lip nearly semicircular, ca. 1.5×4 mm, apex 3-mucronate; lower lip ca. 2.5×3 mm, teeth 2, lanceolate, apex acuminate. Corolla white, ca. 9 mm, subglabrous; tube imperfectly pilose annulate inside, nearly included, ca. 6 mm, slightly constricted at hairy annulus; upper lip straight, subcircular, ca. 3×3 mm; lower lip almost as long as upper, to 4 mm wide; middle lobe obcordate, 2-lobulate. Upper staminal arms ca. 3×as long as lower; lower arms sterile, separate; staminodes short clavate. Nutlets obovoid, ca. 2×1 mm, apex rounded, adaxially ribbed, blackish brown. Fl. Mar, fr. Apr.

- Hillside fields; 200 m. Guangxi (Tian'e Xian).

Apparently a very close ally of *Salvia japonica* but very dwarf.

76. *Salvia filicifolia* Merrill, Lingnan Sci. J. 13: 47. 1934.

蕨叶鼠尾草 jue ye shu wei cao

Salvia japonica Thunberg var. *filicifolia* (Merrill) Metcalf & E. Peter.

Plants perennial. Stems erect or slightly ascending. Leaves 3- or 4-pinnate; petiole 7–10 cm; leaf blade broadly ovate, ca. 7×7 cm; lobes numerous, narrowly elliptic to linear-lanceolate or oblanceolate, margin entire or few lobulate, 8–15×2–4 mm, abaxially glabrous. Verticillasters 6–10-flowered, in pedunculate racemes or panicles 10–23 cm; rachis gray puberulent, glandular pilose; bracts linear-lanceolate, 4–7 mm. Pedicel 1.5–2 mm, puberulent. Calyx tubular, ca. 7 mm, glandular strigose along veins outside; tube ca. 4 mm, sparsely villous annulate at throat inside; upper lip triangular or semicircular, ca. 2.5×3.5 mm, margin entire; lower lip ca. 2.8×3.5 mm, shallowly 2-toothed; teeth triangular, apex spinescent. Corolla yellow, densely pilose; tube imperfectly pilose annulate inside, ca. 8 mm, ca. 1.5 mm wide at base; upper lip oblong, ca. 2.2×1.8 mm; lower lip ca. 2.5×4 mm. Stamens exerted; filaments ca. 2 mm; connectives 6–8 mm,

glabrous, upper arms ca. 5 mm, lower ca. 1.8 mm. Nutlets brown, ellipsoid, ca. 1.5 mm. Fl. May–Sep.

- Rocky and sandy areas. Guangdong, Hunan.

77. *Salvia appendiculata* E. Peter, Acta Horti Gothob. 10: 65. 1935.

附片鼠尾草 fu pian shu wei cao

Plants perennial. Stems erect, 17–55 cm, pubescent or subglabrous. Leaves basal; petiole longer than blade, rarely shorter; leaf blade ovate to elliptic, 3–9.5×2–6 cm, abaxially purple, glandular, finely pilose on veins, margin coarsely crenate. Inflorescence densely fine pilose; verticillasters 4–6-flowered, widely spaced, in racemes or panicles 8.5–16 cm; bracts lanceolate, purplish. Pedicel 1–2 mm. Calyx purple-red, tubular, 5–7 mm, sparsely pubescent glandular, tube 4–6 mm; upper lip broadly triangular to subtruncate, apex entire or 3-denticulate; lower lip slightly longer than upper, teeth triangular. Corolla purple or dark red, 8–10 mm, pilose; tube pilose annulate inside; upper lip oblong, ca. 2.5×2 mm, slightly falcate; lower lip ca. 4×6 mm, lateral lobes circular, ca. 1 mm wide. Filaments ca. 1 mm; connectives slightly curved, ca. 6 mm, lower arms with a membranous subulate appendage at junction. Nutlets brown, oblong, ca. 2 mm. Fl. May.

- Open streamsides, thickets, forests. Guangdong.

Characterized by the subulate appendage at the junction of connective and filament.

78. *Salvia kiangsiensis* C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 584. 1977.

关公须 guan gong xu

Herbs annual. Stems ca. 45(–60) cm, puberulent. Leaves mostly basal; petiole 3–10 cm; leaf blade oblong-ovate to lanceolate, 4–13.5×(1–)2–4(–5.5) cm, abaxially purple, glabrous or veins sparsely puberulent; stem leaves 2-paired, petiole to 1 cm. Inflorescence densely puberulent; verticillasters 2–6-flowered, widely spaced, in terminal or axillary racemes or panicles 7–14 cm; bracts lanceolate, shorter to longer than calyx; bracteoles 1–2 mm. Pedicel 1–2 mm. Calyx tubular-campanulate, 8–9 mm, purple, veins sparsely pilose, tube ca. 6 mm; upper lip semicircular, ca. 2×3 mm, apex obtuse; lower lip slightly longer than upper, ca. 3×3 mm, 2-cleft; teeth triangular, apex acuminate. Corolla purple, ca. 1.2 cm, pubescent; tube pilose annulate inside, tubular, ca. 9 mm; upper lip erect, ovate, ca. 2.5×2 mm; lower lip ca. 3.5×4.5 mm, middle lobe obcordate, lateral lobes circular. Stamens exerted; filaments ca. 1 mm; connectives ca. 5 mm, upper arms ca. 4×as long as lower. Nutlets unknown. Fl. May.

- Valleys, forests. Fujian, Hunan, Jiangxi.

Used medicinally.

Closely allied to *Salvia scapiformis*.

79. *Salvia qimenensis* S. W. Su & J. Q. He, Acta Bot. Yunnan. 6: 55. 1984.

祁门鼠尾草 qi men shu wei cao

Herbs perennial or biennial. Stems erect, 40–60 cm, retrorse pilose. Leaves simple; petiole of basal leaves 2–6 cm, reduced upward to sessile, densely pubescent; leaf blade oblong to ovate-lanceolate, abaxially purple, pubescent on

veins, margin irregularly crenulate; stem leaves 2- or 3-paired, blade of upper leaves ovate-lanceolate to lanceolate, (8-)10-18×2-3.5(-5) cm, base subtruncate to shallowly cordate, sometimes hastate, apex long acuminate. Inflorescences densely glandular pilose; verticillasters 6-flowered, widely spaced, in racemes or panicles; bracts linear-lanceolate, 0.5-1.5(-2)×2-3 cm, margin glandular pilose. Pedicel 2-4 mm. Calyx tubular, upper lip triangular, 1-2×ca. 3 mm, apex 3-mucronate; lower lip almost as long as upper lip, teeth triangular, apex acute. Corolla purple to white, ca. 1.5 cm, glandular pilose except at base, tube pilose annulate inside, 1.1-1.3 cm, straight, 1.5-2 mm wide at base, gradually dilated to apex, ca. 3 mm wide at throat; upper lip ca. 2 mm; lower lip slightly longer than upper, middle lobe 1.5-2.5 mm, oblong to triangular, lateral lobes triangular-ovate. Stamens slightly exerted; filaments ca. 1 mm; connectives slightly curved, ca. 3 mm, upper arms ca. 2 mm. Style slightly exerted, retrorse pubescent. Nutlets gray-brown, ellipsoid, ca. 2×1 mm. Fl. May-Jun.

- Hillsides. Anhui (Qimen Xian).

80. *Salvia hayatae* Makino ex Hayata, Icon. Pl. Formos. 8: 96. 1919.

阿里山鼠尾草 a li shan shu wei cao

Herbs annual. Stems 20-45 cm, retrorse puberulent. Leaves mostly basal, 1- or 2-pinnate; petiole 1-2.5 cm; terminal leaflet 0.8-2.5×0.7-2 cm, ± membranous, adaxially finely strigose, abaxially glabrous, pubescent along veins, base obliquely cuneate to shallowly cordate, margin irregularly lobulate to coarsely crenate, apex acute to obtuse; lateral leaflets subsessile, subcircular, much smaller. Inflorescences densely glandular pilose; verticillasters 2-5-flowered, lower ones widely spaced, upper crowded, in terminal racemes or panicles ca. 14 cm; bracts lanceolate, shorter than pedicels. Pedicel 2-3 mm. Calyx tubular, ca. 5 mm, to 6-6.5 mm in fruit, puberulent on veins or subglabrous, glabrous inside, tube ca. 3.3 mm, upper lip broadly subtriangular; lower lip 2-cleft, teeth narrowly triangular, apex acuminate. Corolla ca. 6.5 mm, slightly exerted, sparsely pubescent; tube pilose annulate inside, ca. 4.5 mm, ca. 1 mm wide at base, slightly constricted at hairy annulus, gradually dilated above hairy annulus, to 1.5 mm wide at throat; upper lip straight, ca. 1 mm; lower lip elongated, ca. 2.5×3.5 mm, lateral lobes ovate. Stamens nearly exerted; filaments ca. 1.5 mm; connectives ca. 3 mm, lower arms ca. 1/2 as long as upper arms. Style included. Nutlets brownish, oblong, ca. 1.5×0.5 mm. Fl. and fr. Apr-May.

- Foothills. Taiwan.

1a. Leaves 2-pinnately compound 80a. var. *hayatae*
1b. Leaves 1-pinnately compound 80b. var. *pinnata*

80a. *Salvia hayatae* var. *hayatae*

阿里山鼠尾草 a li shan shu wei cao

Salvia arisanensis Hayata; *S. scapiformis* Hance var. *arisanensis* (Hayata) Kudô; *S. scapiformis* var. *pinnata* Hayata f. *gracilis* Hayata; *S. scapiformis* var. *pinnata* f. *hirsuta* Hayata.

Leaves 2-pinnately compound.

- Foothills. Taiwan.

80b. *Salvia hayatae* var. *pinnata* (Hayata) C. Y. Wu, Fl. Reipubl. Popularis Sin. 66: 192. 1977.

羽叶变种 yu ye bian zhong

Salvia scapiformis Hance var. *pinnata* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 22: 312. 1906; *S. keitaoensis* Hayata; *S. scapiformis* f. *keitaoensis* (Hayata) Kudô.

Leaves 1-pinnately compound.

- Taiwan.

81. *Salvia adiantifolia* E. Peter, Acta Horti Gothob. 10: 64. 1935.

铁线鼠尾草 tie xian shu wei cao

Plants perennial. Stems 1 to few, ascending or erect, 30-60 cm, slender, finely retrorse pilose or puberulent. Leaves mostly basal, 1-3-pinnate; petioles 3.5-6.5 cm; leaflets sessile or short petiolate, variable; terminal leaflet largest, flabellate to ovate, 0.5-4 cm, adaxially sparsely strigose, abaxially sparsely fine pilose on veins, base cuneate-attenuate to rounded, margin crenate-serrate or 1- or 2-lobulate at base, apex obtuse to short acuminate; stem leaves 1-paired, petiole ca. 1 cm. Inflorescences finely pilose; verticillasters 4-10-flowered, 0.8-2 cm apart, mostly in panicles; bracts lanceolate, margin entire, subglabrous, slightly shorter than pedicels. Pedicel 1-2 mm. Calyx campanulate, 4-5.5 mm, sparsely puberulent on veins, 2-lipped to ca. 1/4 its length; upper lip semicircular, apex mucronate; lower lip strongly 2-toothed, teeth triangular, apex spinescent. Corolla sky blue to white-purple, 7-8 mm, glandular pubescent; tube obliquely pilose annulate inside, throat white pilose, included, gradually dilated to 2 mm wide at throat; upper lip ca. 2 mm, reflexed or nearly straight; lower lip somewhat shorter than upper lip. Filaments ca. 1 mm; connectives ca. 4 mm, upper arms ca. 2×as long as abaxial, fertile. Fl. Jun.

- Foothills, forests. Fujian, Guangdong, Guangxi, Hunan, Jiangxi.

82. *Salvia fragarioides* C. Y. Wu, Fl. Yunnan. 1: 689. 1977.

草莓状鼠尾草 cao mei zhuang shu wei cao

Plants perennial. Stems ascending to suberect, 20-30 cm, densely retrorse puberulent, apex leafless or with reduced leaves. Leaves basal or subbasal, 3-foliolate; petiole 4.5-9.5 cm, densely retrorse puberulent, petiolule of terminal leaflet 5-10 mm, petiolules of lateral leaflets 2-3 mm; terminal leaflets rhombic-ovate, 3-4×1.5-2 cm, strigose especially on veins, base cuneate, margin coarsely and sometimes double crenate-serrate, apex obtuse to acute; lateral leaflets ovate, 1.5-2.5×1-1.5 cm. Inflorescences densely pubescent; racemes terminal, 10-18 cm, pedunculate; verticillasters 4-6, 2- to many flowered, widely spaced; bracts and bracteoles linear, 1.5-2 mm. Pedicel 1.5-2.5 mm. Calyx tubular, 5-8 mm, glandular pilose along veins; upper lip triangular, margin entire, apex 3-mucronate; teeth of lower lip narrowly triangular, apex acuminate. Corolla sparsely puberulent. Filaments slightly shorter than connectives, upper arms ca. 2×as long as lower, with united anther cells. Nutlets unknown. Fl. Oct.

- Rocky riverbanks; 800 m. Yunnan.

Apparently a close ally of *Salvia japonica* only differing in the exannulate calyx and corolla.

83. *Salvia weihaiensis* C. Y. Wu & H. W. Li, Fl. Reipubl. Popularis Sin. 66: 585. 1977.

威海鼠尾草 wei hai shu wei cao

Herbs. Stems erect, ca. 25 cm, densely pilose. Petiole of basal leaves 2–2.5 cm; leaf blade simple, oblong, 6.5–7×3.2–3.7 cm, subglabrous, sparsely pilose on veins, base subtruncate, margin irregularly undulate-crenate, apex obtuse to rounded; stem leaves subsessile, broadly ovate, ca. 3×2.7 cm. Inflorescences densely pilose; verticillasters 2–8-flowered, in terminal racemes or panicles; bracts broadly ovate to subcircular, ca. 5×4 mm, margin ciliate, apex spinescent, ca. 1.5 mm. Pedicel 1–1.5 mm. Calyx tubular-campanulate, 5.5–6 mm, pilose; upper lip semicircular, ca. 2×3 mm, apex ± 3-mucronate; lower lip slightly longer than upper, ca. 3 mm; teeth 2, narrowly triangular, apex spinescent. Corolla included or slightly exserted, sparsely puberulent, glandular on limb, glabrous inside; tube gradually dilated, to ca. 2 mm wide at throat; upper lip ca. 2 mm. Filaments ca. 1 mm; connectives ca. 3.2 mm, upper arms ca. 2 mm, lower arms ca. 1.2 mm. Style subequally 2-cleft. Nutlets unknown. Fl. Jun.

- Seashores. Shandong (Weihai Shi).

Related to *Salvia japonica* but with simple oblong leaves and exannulate calyx and corolla.

84. *Salvia piasezkii* Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint Pétersbourg 11: 304. 1881.

秦岭鼠尾草 qin ling shu wei cao

Herbs erect, viscid-villous. Stems ca. 18 cm, spreading villous at base, apex glandular pilose. Leaves pinnate, with petiolulate incised-serrate leaflets; basal leaves 3-foliolate, terminal leaflet ca. 1.2×1.1 cm, base truncate to rounded, lateral leaflets ovate, ca. 6×5 mm, apex obtuse; mid stem leaves 5-foliolate, terminal leaflets subrhombic, ca. 1.8×1.2 cm, lateral leaflets ca. 1.5×0.6 cm. Verticillasters 6-flowered, widely spaced, in few-branched panicles; bracts lanceolate, slightly shorter than pedicels. Pedicel ca. 1/3 as long as calyx. Calyx tubular, ca. 5 mm in flower, subcampanulate, ca. 7 mm in fruit, densely glandular hairy, finely 10-veined; upper lip broadly triangular, margin entire, apex acute; lower lip longer than upper lip, teeth narrowly triangular, apex mucronate. Corolla purple, ca. 7 mm, slightly exserted; tube included, without hairy annulus inside; upper lip entire, short falcate; lower lip pilose, middle lobe ca. 2×as long, ca. 1.5×as wide as lateral lobes, circular, concave. Stamens included; filaments longer than arcuate connectives, lower arms ca. 1/3 as long as upper. Style exserted. Nutlets dark green, oblong-ellipsoid, less than 2 mm, adaxially ribbed, smooth, shiny (specimens not seen).

- Gansu, Shaanxi.

