
Herbs, perennial. Roots usually thickened, various in shape, carrot-shaped, mostly fleshy. Caudexes often short, sometimes elongated and branched. Stems erect, less frequently ascending. Basal leaves often rosulate, usually long petiolate, cordate; cauline leaves mostly alternate, rarely opposite or verticillate. Flowers in a cyme; cymes sometimes reduced to a branch with 1 terminal flower and 1 to several bracts, sometimes glomerate into a panicle. Calyx epigynous, rarely semi-epigynous, tube various in shape; lobes 5, entire or dentate. Corolla always epigynous, campanulate, funnelform, or tubular, 5-lobed or 5-fid to middle. Stamens 5; filaments much dilated into a lamella at base; lamellae densely ciliate-villous, valvate, enveloping disk; anthers elongate. Disk usually tubular, rarely annular. Ovary inferior, 3-locular; ovules numerous; style with pollen-receiving hairs; stigma 3-lobed, lobes narrow, recurved. Capsule 3-poricidal below persistent calyx lobes. Seeds numerous, ellipsoid, 1-angular.

Sixty-two species: E Asia, south to India and Vietnam, with one species extending into Europe and another endemic to Crimea; 38 species (23 endemic) in China.

1a. Cauline leaves all or mostly verticillate.
2a. Corolla small, less than 11 mm; calyx lobes filiform ................................................................. 38. A. tetraphylla
2b. Corolla larger than 13 mm; calyx lobes lanceolate or subulate.
3a. Calyx lobes toothed; corolla tubular-campanulate, 18–20 mm; style exserted or included. 31. A. pereskiiifolia
3b. Calyx lobes entire; corolla campanulate, 13–20 mm; style exerted or included.
4a. Cauline leaves partially verticillate; inflorescence branches not verticillate; calyx lobes lanceolate,
   3–6 mm ................................................................................................................................. 31. A. pereskiiifolia
4b. Cauline leaves all verticillate; inflorescence branches often verticillate; calyx lobes elliptic-lanceolate, 5–10 mm ......................................................... 32. A. divericata

1b. Cauline leaves all alternate.
5a. Cauline leaves (at least lower ones) petiolar, very rarely subsessile.
6a. Calyx lobes toothed.
7a. Cauline leaves pinnatifid up to over half; capsule columnar, base rounded, only ca. 3 mm wide ............... 34. A. lobophylla
7b. Cauline leaves toothed; capsule ellipsoid, base obtuse, more than 3 mm wide.
8a. Cauline leaves with petioles 2–4 cm, corolla at base; disk ca. 0.7 mm high; style equal to corolla
   in length ................................................................................................................................. 8. A. lilifolia
8b. Cauline leaves with petioles less than 2.5 cm, cuneate or shallowly corolla at base; disk 1.5–2.5 mm;
   style ± exserted.
9a. Inflorescence a pseudoraceme or narrow panicle, without secondary branches; calyx lobes with
   verrucose teeth, or even entire; leaves glabrous adaxially ......................................................... 2. A. remotiflora
9b. Inflorescence a large panicle, with secondary branches; calyx lobes with 1–4 pairs of long
   teeth, rarely verrucose teeth; leaves sparsely scaberulous adaxially ............................................ 20. A. petaninii

6b. Calyx lobes entire, usually ovate to lanceolate, rarely linear-lanceolate, (1–)1.5–4 mm wide.
10a. Cauline leaves all obviously petiolar, base corolla or rounded, not deciduous or shortly deciduous;
    calyx lobes obtuse at apex.
11a. Cauline leaves all cordate, papery; calyx tube (hypanthium) obconic at least at anthesis ............ 1. A. tracheliooides
11b. Cauline leaves rounded or broadly cuneate, only some lower ones shallowly cordate, membranous;
    calyx tube obvoid or obovoid-conical ....................................................................................... 2. A. remotiflora
10b. Cauline leaves only lower ones petiolar, upper ones sessile or shortly cuneate-petiolar; calyx lobes
    acute or acuminate at apex.
12a. Cauline leaves only 2, lower one corolla, upper one much smaller ................................................ 5. A. brevidiscifera
12b. Cauline leaves many, not corollate.
13a. Calyx tube globose, calyx lobes subulate-lanceolate, 8–14 mm; pedicels 1.5–3 cm ..................... 6. A. longipedicellata
13b. Calyx tube obvoid or obconical, calyx lobes usually shorter; pedicels shorter.
14a. Corolla 1.5–2.7 cm, lobes 5–11 mm; calyx lobes ovate to linear-lanceolate, 1.5–4 mm wide ........ 3. A. petiolata
14b. Corolla less than 1.8 cm, lobes less than 5 mm; calyx lobes linear-lanceolate or subulate,
    1–2 mm wide.
15a. Leaves usually sparsely hispidulous, 7–13 × 1.5–3 cm; calyx mostly hairy, occasionally
    glabrous, lobes 1–2 mm wide; corolla ca. 17 mm ................................................................. 4. A. rupincola
15b. Leaves glabrous or hairy along veins, 3–8 cm; calyx glabrous, occasionally scaberulous;
    corolla 13–15 mm.
16a. Leaves often hairy on margins and along veins; calyx tube obvoid or obconical; inflorescence
    narrow panicle or pseudoraceme ........................................................................................... 8. A. lilifolia
16b. Leaves glabrous throughout; calyx tube usually globose, rarely obovoid-globose; inflorescence
a panicle .......................................................... 11. A. sinensis

5b. Cauline leaves sessile, only some individuals of some species (e.g., A. stricta) with lower cauline leaves very
shortly winged-petiolate.

17a. Corolla small, less than 17 mm, constricted at throat and thus corolla urceolate; style strongly exserted,
more than 1.5 x as long as corolla; disk narrowly tubular, 2–7 mm, less than 1 mm wide.

18a. Calyx lobes filiform, 3–20 mm, sometimes with 1 or 2 pairs of verrucose teeth at lower part ................... 37. A. capillaris

18b. Calyx lobes subulate, entire.

19a. Stems and leaves densely scaberulose; corolla 10–17 mm ........................................................... 35. A. stenantha

19b. Stems and leaves glabrous or villous; corolla 8–12 mm .......................................................... 36. A. lilifoliioides

17b. Corolla usually larger, campanulate; style slightly exserted or included, less than 1.5 x as long as corolla;
disk not much longer than broad.

20a. Calyx lobes entire.

21a. Calyx scaberulose; calyx lobes subulate, broadest at base, 6–8 mm; style nearly as long as corolla .......... 10. A. stricta

21b. Calyx mostly glabrous, if hairy then corolla ± constricted at throat; calyx lobes triangular-lanceolate
to linear-lanceolate, 2–6 mm, if more than 6 mm then calyx tube never globose and glabrous; style
obviously exserted or not.

22a. Calyx very short, shorter than 2.5 mm.

23a. Cauline leaf blade linear, ca. 5 cm x 0.8 mm; corolla 18–19 mm .................................................. 14. A. pinifolia

23b. Cauline leaf blade linear to oblong, 1.5–4 x 0.3–1 cm; corolla 12–14 mm ........................................ 15. A. micrantha

22b. Calyx lobes longer than 3 mm, broadest at middle.

24a. Calyx variously hairy; corolla shallowly lobed, ± constricted at throat, lobes less than 1/4 as long
as total length, often reflexed.

25a. Corolla throat slightly constricted, 9–15 mm wide; corolla lobes 4–6 mm .................................... 12. A. polyantha

25b. Corolla throat strongly constricted, 4–7 mm wide; corolla lobes up to 3 mm .............................. 13. A. contracta

24b. Calyx glabrous; corolla more deeply lobed, not constricted at throat, lobes more than 1/4 as long
as total length.

26a. Calyx lobes elliptic, ca. 2 mm wide, middle part broadest, nearly 2 x as broad as base .................... 16. A. palustris

26b. Calyx lobes linear-lanceolate or subulate, base broadest or middle part broadest but not 2 x as
broad as base.

27a. Calyx lobes subulate, base broadest.

28a. Disk broadly tubular, 3–8 mm, up to 3 mm wide; calyx lobes 5–10 mm; inflorescence a
 pseudoraceme .......................................................... 17. A. himalayana

28b. Disk less than 1.5 mm; calyx lobes 3–5 mm; inflorescence a panicule, rarely a pseudoraceme.

29a. Cauline leaves ovate to lanceolate, 5–25 mm wide; corolla 12–21 mm ........................................ 18. A. amurica

29b. Cauline leaves mostly linear to linear-elliptic, less than 5 mm wide; corolla 10–13 mm
 .......................................................... 19. A. gmelinii

27b. Calyx lobes linear-lanceolate, middle part broadest, or at least broadest part not at base.

30a. Corolla 16–28 mm, lobes 6–8 mm; leaves entire or sparsely serrate, 2–13 mm wide; style
usually shorter than or nearly as long as corolla ............................................................ 19. A. gmelinii

30b. Corolla 13–22 mm, lobes 4–6 mm; leaves always crenulate, 5–40 mm wide; calyx lobes
3–6 mm; style exserted or not.

31a. Style included or as long as corolla; leaves 2.5–7 cm; corolla lobes 4–6 mm ......................... 9. A. lamarckii

31b. Style exserted; leaves 6–13 cm; corolla lobes ca. 4 mm ....................................................... 31. A. pereskiifolia

20b. Calyx lobes toothed.

32a. Calyx lobes ovate-triangular, overlapping at lower part, recurved toward lateral side; capsule
subglobose; style included .................................................. 21. A. tricuspidata

32b. Calyx lobes narrower, never overlapping, not recurved; capsule subglobose or not; style exserted
or included.

33a. Cauline leaves aggregated at middle part of stems, glabrous, lanceolate or linear-elliptic .......... 22. A. wilsonii

33b. Cauline leaves evenly distributed or aggregated at lower part of stems, glabrous or hairy.

34a. Cauline leaves linear or linear-elliptic, less than 5 mm wide; calyx lobes subulate, 3–4 mm;
corolla 10–13 mm .......................................................... 23. A. stenophylla

34b. Cauline leaves wider; calyx lobes mostly larger; corolla mostly longer.

35a. Flowers solitary and terminal, or several in a pseudoraceme, very occasionally in a narrow
panicle; corolla 2–3.4 cm, narrowly campanulate .......................................................... 24. A. elata

35b. Flowers several to numerous, in a pseudoraceme or panicle; corolla rarely (except in
A. morrisonensis) more than 2.4 cm, campanulate or broadly campanulate.

36a. Leaves mostly glabrous; stems mostly glabrous, or puberulent.
37a. Calyx lobes narrowly subulate, ca. 0.5 mm wide; style exerted 4–7 mm above corolla ...... 28. *A. hubeiensis*

37b. Calyx lobes 1–2 mm wide; style included, or slightly exerted, less than 4 mm above corolla.

38a. Corolla 28–35 mm; disk less than 1 mm ................................................................. 29. *A. morrisonensis*

38b. Corolla much shorter; disk longer.

39a. Capsule ellipsoid or oblong, more than 3 mm in diam.; calyx lobes 5–7 mm .......... 8. *A. liliifolia*

39b. Capsule narrowly ellipsoid, ca. 3 mm in diam.; calyx lobes 2–4(–6) mm ............. 30. *A. ningxianica*

36. Leaves ± hairy; stems usually hairy.

40a. Leaves mostly aggregated at lower half of stems, upper ones absent or much smaller; calyx lobes 5–20 mm, obviously toothed.

40b. Capsule 3–7 mm.

41a. Calyx lobes 5–8(–10) mm, often gray; corolla lobed to middle or near middle; disk 0.5–1 mm ................................................................. 26. *A. jasionifolia*

41b. Calyx lobes 8–20 mm, green; corolla lobed to 1/3; disk 1.2–3.5 mm .......................... 27. *A. coelestis*

42b. Cauline leaves with numerous teeth, adaxially sparsely scaberulate, hispidulous, or glabrous, abaxially hispid or hispidulous; disk less than 1.4 mm.

43a. Cauline leaves narrowly elliptic or lanceolate, 0.5–2.5 cm; style mostly as long as corolla ................................................................. 18. *A. amurica*

43b. Cauline leaves ovate, 1.5–6.5 cm; style ± exerted ..................................................... 25. *A. khasiana*


**荠苨**

Stems single, 40–120 cm tall, up to 1 cm in diam., often zigzag-twisted, sometimes branched. Cauline leaves alternate; blade ovate or elliptic, 3–13 × 2–8.5 cm, base cordate, truncate, obtuse, or cuneate, margin serrate or doubly serrate, apex obtusely to shortly acuminate; petiole 1–6 cm, sometimes winged. Inflorescence branches mostly long and horizontally spreading, forming a large panicle, less frequently short, forming a narrow panicle. Hypanthium broadly obconic; calyx lobes elliptic or lanceolate 4–13 × 2–4 mm, margin entire (rarely ciliate). Corolla blue, blue-purple, or white, campanulate, 2–2.5 cm; lobes broadly elliptic, 5–7 mm wide, apex acute. Disk tubular, 2–3 mm. Style as long as corolla. Capsule ovoid-conical, ca. 7 × 5 mm. Seeds yellow-brown, black at both ends, narrowly oblong, slightly compressed, 0.8–1.5 mm. Fl. Jul–Aug, fr. Aug–Sep. 2n = 34*, 36*.

- Mountain and hill slopes, grasslands, forest margins; below 2400 m. Anhui (Huang Shan), Hebei, N Jiangsu, Liaoning, Nei Mongol (Ongniu Qi), Shandong, Zhejiang (Hangzhou, Tianmu Shan).


**苏南荠苨**

Stems and leaves usually densely white hispid. Leaves often whitish green abaxially. Calyx and disk typically white hairy. Corolla pale purple.

- Hill slopes; lower elevations. S Jiangsu (Nanjing, Taihu, Zhenjiang).


**薄叶荠苨**


Stems single, 40–100 cm tall, glabrous, usually simple. Cauline leaves long petiolate; blade typically ovate to ovate-lanceolate, rarely ovate-ribicular, 5–13 × 2–7 cm, membranous, glabrous, base mostly truncate, rounded, or obtuse, rarely coriaceous, margin serrate or doubly serrate, apex usually acuminate; petiole up to 3 cm. Flowers often solitary on pedicels, less frequently in several-flowered cymes, forming a pseudoraceme or narrow panicle. Hypanthium obvoid or obvoid-obconic, glabrous; calyx lobes lanceolate, 7–12 × 1.5–2 mm, margin entire. Corolla blue, campanulate, 2–3.5 cm; lobes 7–12 mm. Disk cylindrical, 2.5–3 cm, ca. 1 mm in diam. Capsule obvoid, 5–8 × 4–7 mm. Seeds narrowly oblong, slightly curved, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep. 2n = 34, 36.

Forest margins, forests, meadows; below 1700 m. Heilongjiang (Ning’an, Shangzhi), Jilin (E of Fusong and Jiaohe), SE Liaoning (Benxi, Huanren, Kuandian) [Japan, Korea, Russia (Far East)].

秦岭沙参 qin ling sha shen

Stems 60–120 cm tall, simple, glabrous or sparsely white hispidulous. Cauline leaves usually long petiolate, very rarely almost sessile; blade ovate, 3–15 × 2–5 cm, abaxially glabrous or hispidulous along veins, adaxially sparsely puberulent or glabrous, base broadly cuneate or subtruncate, margin serrate, apex acute to acuminate; petiole winged, up to 8 cm. Inflorescence branches long and horizontally spreading, forming a large panicle, or extremely short, with only 2 or 3 flowers or even a single flower, and thus forming an extremely narrow panicle or even a pseudoraceme; inflorescence racemes and all floral parts glabrous, scaberulose, or puberulent. Hypanthium obconic or obvoid; calyx lobes ovate-lanceolate, or linear-lanceolate, 4–9 × 1.5–4 mm, overlapping at base or not. Corolla blue, pale blue, purple, or white, campanulate, 15–27 mm; lobes ovate-deltoid, 4–11 × 7–9 mm. Disk shortly tubular, (0.5–)1–2.5 mm, glabrous or hairy at apex. Style nearly as long as corolla. Capsule ovoid-ellipsoid or obvoid, 5–8 × 4–6 mm. Seeds yellow-brown, oblong, slightly compressed, 1–1.5 mm, 1-ribbed. Fl. Jul–Sep, fr. Sep–Oct. 2

3a. Adenophora petiolata subsp. petiolata

盘叶沙参 xiang ye sha shen


Cauline leaves mostly petiolate, or at least lower ones petiolate, rarely subsessile. Inflorescence racemes and floral parts often scaberulose. Calyx lobes 2–4 mm wide, ± overlapping at base. Disk 1.5–2.5 mm, mostly hairy. Corolla 1.5–2 cm; lobes 4–7 mm.

● Mountain slopes, grasslands, forest margins; below 2000 m. Changqing, Guangdong (Liannan, Renhua, Ruyuan), Guangxi (Lingchuan, Xing’an, Yangshuo), Guizhou (Kaili), W Henan, Hubei, Hunan, W Jiangxi, Shaanxi (S of Tongchuan), S Shanxi (Jincheng, Lingchuan, Yangcheng), Sichuan.


Huadung沙参 hua duong xiang ye sha shen


Cauline leaves subsessile, only lower ones shortly petiolate; petiole rarely up to 1.5 cm. Calyx lobes 1–2.5 mm wide, never overlapping. Disk (0.5–)1–1.5(–2) mm, mostly glabrous.

● Grassy slopes, forests; below 1900 m. S Anhui, W Fujian (Liancheng, Yong’an), Jiangsu (Liyang, Nanjing), E Jiangxi (including Lu Shan), Zhejiang (Longquan, Taimu Shan).


多毛沙参 duo mao sha shen

Adenophora pubescens Hemsley.

Stems 70–150 cm tall, simple or with branches slender and upright, usually scaberulose, less often subsessile. Lower cauline leaves petiolate, upper ones sessile; blade ovate-lanceolate to elliptic, 6–13 × 1.5–5 cm, both surfaces usually sparsely hispidulous, rarely almost glabrous, base attenuate, margin serrate, apex acuminate; petiole winged. Inflorescences with branches forming a panicle; inflorescence racemes, pedicels, and calyx rather densely puberulent or hispidulous, occasionally glabrous; pedicels short and stout, ca. 5 mm, or rarely elongate. Hypanthium obvoid or obconic; calyx lobes lanceolate to linear-lanceolate, 5–8 × 1–2 mm, very rarely reflexed. Corolla blue-purple or purple, campanulate, ca. 17 mm; lobes deltoid, ca. 5 mm. Disk annular to shortly tubular, 0.5–1.5 mm, glabrous. Style 2–2.2 cm, obviously exerted. Fl. Sep.

● Ravines, grassy slopes; below 1500 m. W Hubei, NW Hunan (Cili), Jiangxi, Sichuan.


短花盘沙参 dian hua pan sha shen

Adenophora brevidiscifera D. Y. Hong.

Stems ascending, slender, ca. 35 cm tall, simple, densely hirsute below, glabrous above. Basal leaves long petiolate, hirsute; blade ovate, ca. 3 cm wide, abaxially sparsely hirsute along

Adenophora brevidiscifera resembles A. jasionifolia, from which it differs in having calyx lobes entire, the lower corolla leaves long petiolate and cordate, and disk shorter.


- **湖北沙参** hu bei sha shen

Stems 1–3 m tall, simple or with slender branches up to 70 cm, glabrous. Basal leaves ovate, base cordate. Cauine leaves (at least lower ones) petiolate; blade ovate-elliptic or lanceolate, 7–12 × 2–5 cm, papery, glabrous or abaxially sparsely hispidulous along veins, base cuneate or obtuse, margin serrate or doubly serrate, apex acuminate. Inflorescences with slender and long branches, forming a large lax panicle, glabrous or puberulent; pedicels slender, 1–3 cm. Hypanthium subglobose or obvoid, glabrous; calyx lobes subulate-lanceolate, 8–14 mm. Corolla white, purple, or pale blue, funnelform, 1.9–2.1 cm; lobes deltoïd, 5–6 mm. Disk annular, ca. 1 mm or shorter, glabrous. Style ca. 2.1 cm, almost as long as or slightly longer than corolla. Fl. Aug–Oct.

- **Forests of Pinus yunnanensis;** 2700–3000 m SW Sichuan (Yanyuan).

Adenophora brevidiscifera resembles A. jasionifolia, from which it differs in having calyx lobes entire, the lower corolla leaves long petiolate and cordate, and disk shorter.


- **湖北沙参** hu bei sha shen

Stems 1–3 m tall, simple or with slender branches up to 70 cm, glabrous. Basal leaves ovate, base cordate. Cauine leaves (at least lower ones) petiolate; blade ovate-elliptic or lanceolate, 7–12 × 2–5 cm, papery, glabrous or abaxially sparsely hispidulous along veins, base cuneate or obtuse, margin serrate or doubly serrate, apex acuminated. Inflorescences with slender and long branches, forming a large lax panicle, glabrous or puberulent; pedicels slender, 1–3 cm. Hypanthium subglobose or obvoid, glabrous; calyx lobes subulate-lanceolate, 8–14 mm. Corolla white, purple, or pale blue, funnelform, 1.9–2.1 cm; lobes deltoïd, 5–6 mm. Disk annular, ca. 1 mm or shorter, glabrous. Style ca. 2.1 cm, almost as long as or slightly longer than corolla. Fl. Aug–Oct.

- **Forests of Pinus yunnanensis;** 2700–3000 m SW Sichuan (Yanyuan).


- **心叶沙参** xin ye sha shen

Caudexes with horizontal branches and alternate membranaceous scales. Stems 1 or 2, erect, ca. 50 cm tall, simple, glabrous or retrorsely hirsute. Basal leaves unknown. Cauine leaf blade orbicular or ovate, 3–7 × 2–6 cm, both surfaces sparsely hirsute or abaxially glabrous, base cuneate with sinus 5–3 mm deep; petiole 2–4 cm, upper ones often shorter and sometimes ± decurrent. Inflorescences with short branches, forming a narrow panicle; pedicels less than 5 mm. Hypanthium obvoid, glabrous; calyx lobes linear-lanceolate, 3–7 × 1–1.5 mm, with 2 or 3 pairs of denticles up to 1 mm. Corolla purple, campanulate, 13–15 mm; lobes ovate-deltoid, ca. 1/2 as long as tube. Disk annular, 0.5–0.7 mm, glabrous. Style as long as corolla. Fl. Jul–Aug.

- **Meadows, scrub, cliffs;** below 2400 m. Chongqing (Fengjie, Nanchuan), Guizhou (Xishui), W Hubei (Laifeng), WC Sichuan.

8. **Adenophora liliifolia** (Linnaeus) A. Candolle, Monogr. Campan. 358. 1830.

- **新疆沙参** xin jiang sha shen


Roots carrot-shaped, 8–10 × 1–2 cm. Stems 50–150 cm tall, simple or branched, glabrous. Cauine leaves sessile or shortly petiolate, blade lanceolate or ovate, 5–13 × 1–5 cm, both surfaces glabrous, rarely sparsely white hirsute abaxially, margin serrate, apex acute to shortly acuminate; petiole (if present) up to 6 mm. Inflorescence a narrow panicle with branches with up to 7 flowers, or rarely only several flowers forming a pseudoraceme; pedicels slender, up to 2.5 cm. Hypanthium obvoid or obconic, glabrous; lobes lanceolate, 5–7 × 1–1.5 mm, mostly reflexed from anthesis, margin usually with a pair of denticles or rarely entire. Corolla blue or pale blue, campanulate, 1.2–2.2 cm; lobes ovate, ca. 1/2 as long as tube, apex acute. Disk shortly tubular, 1.5–2.5 mm, glabrous. Style as long as corolla or slightly exserted. Fl. Jul–Aug. 2n = 34, 102.

- **Forests, scrub, NW Xinjiang (Burqin, Korgas, Toli) [Kazakhstan, Russia (European part); Europe].


- **天山沙参** tian shan sha shen

Adenophora liliifolia (Linnaeus) A. Candolle var. lamarckii (Fischer) Krylov; Campanula lamarckii (Fischer) D. Dietrich.

Roots carrot-shaped, up to 2.5 cm in diam. Stems simple, 30–100 cm tall, glabrous, rarely white pubescent. Cauine leaves sessile; blade ovate-lanceolate, 2.5–7 × 0.5–3 cm, both surfaces glabrous, sometimes hirsutulous abaxially, base cuneate, margin serrate, apex acute or acuminate. Flowers several in a pseudoraceme or inflorescences with short branches of 2–4 flowers, forming a narrow panicle; pedicels less than 1 cm. Hypanthium obvoid or obconic, glabrous; calyx lobes linear-lanceolate or subulate, 3–5 × 1–1.5 cm, widest at base or at lower part, margin usually entire. Corolla blue, campanulate-campanulate, 1.5–2.2 cm; lobes ovate, ca. 1/2 as long as tube, apex acute. Disk shortly tubular, 1–2.5 mm, glabrous. Style nearly as long as or slightly longer than corolla. Fl. Jul–Aug. 2n = 34, 102.

- **Forests, forest margins. N Xinjiang (Fukang, Toli, Wenquan) [Kazakhstan, Korea, N Mongolia, Russia (S Siberia)].


- **沙参** sha shen

Stems 40–80 cm tall, simple, often hirsutulous or villous, rarely glabrous. Basal leaves ovate, base cordate. Cauline leaves sessile (lower ones sometimes with extremely short, winged petiole); blade elliptic or narrowly ovate, 3–11 × 1.5–5 cm, sparsely hirsutulous, hirsute, or subglabrous, base cuneate, apex acute or shortly acuminate. Flowers often in a pseudo-
10a. Adenophora stricta subsp. stricta

10b. Adenophora stricta subsp. sessilifolia

10c. Adenophora stricta subsp. confusa

10d. Adenophora stricta subsp. aurita
blade ovate, lanceolate, or elliptic, occasionally linear-lanceolate, 2–10 × 0.5–2.5 cm, glabrous or hispidulous, margin serrate with teeth distant. Cymes with solitary flowers forming a pseudoraceme, or in a narrow panicle with short inflorescence branches; pedicels usually less than 1 cm. Hypanthium obconic, usually pubescent, rarely glabrous; calyx lobes triangular-lanceolate, 3.5–7 × 1–2 mm, margin entire. Corolla purple or dark blue, campanulate, slightly constricted at throat, 1.4–2.2 cm; lobes often reflexed, short, up to 1/4 as long as whole corolla. Disk tubular, (2–)2.5–4 mm, often sparsely puberulent. Style usually slightly exerted or sometimes as long as corolla. Capsule ovoid-ellipsoid, 5–12 × 4–7 mm. Seeds yellow-brown, usually slightly exserted or sometimes as long as corolla. 

Sunny grassy slopes; below 2000 m. E Liaoning [NW Korea].

12a. Adenophora polyantha

Stems and leaves ± hispidulous. Calyx lobes hispidulous, rarely glabrous; capsule 6–12 mm; stems and leaves ± hispidulous

12a. subsp. polyantha

Stems and leaves glabrous or puberulent. Calyx lobes mostly glabrous or sparsely hispidulous. Capsule 5–7 mm. 2n = 34. Fl. and fr. Aug–Oct.

Sunny grassy slopes; below 2000 m. E Liaoning [NW Korea].

12b. Adenophora polyantha

Stems few to several dozen from a single caudex, erect, 30–40 cm tall, often simple, densely retrorsely hispidulous. Cymes with a terminal flower or with several flowers, forming a narrow panicle; pedicels less than 1 cm. Hypanthium obconic, 1.5–2 mm, glabrous; calyx lobes narrowly triangular, 2–2.5 × 0.7–0.9 mm, margin entire. Corolla blue, tubular-campanulate, 12–14 mm; lobes ovate-deltoid, 3.5–4.5 mm. Stamens much shorter than corolla. Capsule ovoid-globose, 4 × 3.5 mm. Fl. Jul–Aug.

● Grassy or stony slopes. E Nei Mongol.

16. Adenophora palustris


Sunny grassy slopes. W Liaoning, Nei Mongol.

14. Adenophora pinifolia


松叶沙参 song ye sha shen

Roots columnar. Stems erect, densely leafy. Cauine leaves sessile; blade linear, ca. 5 cm × 0.8 mm, slightly fleshy, margin entire, apex acute. Inflorescence a panicule. Hypanthium obconic, ca. 2.5 mm, glabrous; calyx lobes subulate, 1.5–2 mm, margin entire. Corolla campanulate, 18–19 mm; lobes 2–4 × 6–7 mm. Disk ca. 4.5 mm, glabrous. Style as long as corolla. Capsule oblong. Fl. Aug–Sep. 2n = 34*.

● Open grassy slopes. Liaoning (Dafangshen, Dalian, Heishan).

15. Adenophora micrantha


小花沙参 xiao hua sha shen

Adenophora suolannensis P. F. Tu & X. F. Zhao.

Stems few to several dozen from a single caudex, erect, 30–40 cm tall, often simple, densely retrorsely hispidulous. Cauline leaves sessile; blade linear to oblanceolate, 1.5–4 × 0.3–1 cm, both surfaces sparsely scaberulose or subglabrous. Cymes with a terminal flower or with several flowers, forming a narrow panicle; pedicels less than 1 cm. Hypanthium obconic, 1.5–2 mm, glabrous; calyx lobes narrowly triangular, 2–2.5 × 0.7–0.9 mm, margin entire. Corolla blue, tubular-campanulate, 12–14 mm; lobes ovate-deltoid, 3.5–4.5 mm. Stamens much shorter than corolla. Disk large tubular, 2.5–3 mm, sparsely villous at apex. Style ca. 16 mm, obviously exerted. Capsule ovoid-globose, ca. 4 × 3.5 mm. Fl. Jul–Aug.
Stems erect, ca. 1 m tall, simple, glabrous. Cauline leaves sessile; blade oblong or ovate-orbicular, 5–7 × 1.5–3 cm, papyry, lucid, glabrous, base rounded or obtuse, margin crenate or irregularly serrate, apex acute or rounded. Flowers several in a compact pseudoraceme. Hypanthium glabrous; calyx lobes ovate-lanceolate, ca. 5.5 × 2 mm, nearly 2 × as broad at middle as at base, distinctly reticulate veined, margin entire, apex obtuse or acute. Corolla broadly campanulate, ca. 2 cm in diam. Disk ca. 4 × 1.5 mm, glabrous. Style slightly longer than corolla. Capsule obovoid, 7–8 × 4–6 mm. Fl. and fr. Aug. 2n = 102.

17. Adenophora himalayana


喜马拉雅沙参 xi ma la ya sha shen

Roots often thickened, up to 1 cm in diam. Stems often several from one root, 15–60 cm tall, simple, glabrous, less often retrorsely hispidulous or sparsely retrorsely hirsute. Basal leaves petiolate; blade deltoid or ovate. Cauline leaves sessile or lower ones shortly petiolate; blade ovate, lanceolate, narrowly elliptic, or linear, 3–14 × 0.1–2.5 cm, glabrous, very rarely hairy, margin entire or sparsely serrate. Flowers solitary, or several in a pseudoraceme, never in a panicle. Hypanthium obovoid or obovoidal, glabrous; calyx lobes subulate, 5–10 × 1.5–2 mm. Corolla blue or blue-purpl e, campanulate, 1.7–2.2 cm; lobes ovate-deltoid, 4–7 mm. Disk broadly tubular, 3–8 × 2–3 mm. Style nearly as long as or slightly longer than corolla. Capsule obovoid-oblong, 5–10 × 4–7 mm. Fl. Jul–Sep, fr. Aug–Sep.

Meadows or grassy places at forest margins, alpine meadows or scrub; (1200–)2500–4700 m. Hebei, Heilongjiang, NE Jilin, Liaoning, E, N, S, Wu, Shuajingsi, Songpan) [N India].

1a. Calyx lobes entire, very occasionally margin with verrucose denticles; leaves usually broadly linear, less often narrowly elliptic to ovate-lanceolate

................................................................. 17a. subsp. himalayana

1b. Calyx lobes rarely entire, usually margin with verrucose denticles; leaves mostly ovate to ovate-lanceolate, up to 2.5 cm wide, rarely broadly linear

................................................................. 17b. subsp. alpina

17a. Adenophora himalayana subsp. himalayana

喜马拉雅沙参(原亚种) xi ma la ya sha shen (yu yan ya zhong)

Adenophora smithii Nannfeldt; A. smithii f. crispa Nannfeldt.

Leaves usually broadly linear, rarely narrowly elliptic to ovate-lanceolate. Calyx lobes entire, very occasionally with verrucose denticles on margins. Disk 2–3 mm in diam. Style slightly exserted.

Alpine meadows or scrub; 3000–4700 m (1200–3000 m in Xinjiang). C Gansu, E and S Qinghai, NW Sichuan, Xijiang (Tian Shan, Wuqia, Yecheng), Xizang [N India, E Kazakhstan, Kyrgyzstan, Nepal, Tajikistan].


高山沙参 gao shan sha shen


Leaves mostly ovate to ovate-lanceolate, up to 2.5 cm wide, less often broadly linear, abaxially often sparsely hispidulous. Calyx lobes often with verrucose denticles on margins, occasionally entire. Disk 1.5–2.5 mm in diam. Style often included.

Meadows or grassy places at forest margins; 2500–4200 m. SE Gansu (Lintao: Lianhua Shan), Shaanxi (Qin Ling), NW Sichuan (Pingwu, Shuajingsi, Songpan) [N India].

18. Adenophora amurica


阿穆尔沙参 a mu er sha shen

Stems 1–3 from a single root, erect, 35–105 cm tall, simple, densely retrorsely hirsute. Basal leaves long petiolate; blade ovate, base cordate. Cauline leaves sessile; blade narrowly ovate, lanceolate, or elliptic, 4.8–10 × 0.5–2.5 cm, abaxially densely retrorsely hirsute, adaxially glabrous or hispidulous along veins, margin serrate. Cymes with 1–5 flowers, in a narrow panicule or pseudoraceme; pedicels ca. 3 mm. Hypanthium ellipsoid, glabrous or hispidulous; calyx lobes narrowly lanceolate, 5–6 × 0.7–1.5 mm, margin entire or with 1 or 2 sometimes verrucose denticles. Corolla blue or blue-purple, campanulate, 1.2–2.1 cm; lobes broadly ovate-deltoid. Disk shortly tubular, 0.4–1.4 mm. Style as long as corolla. Capsule ellipsoid, 6–10 × 4–5.5 mm. Seeds brown-red, ellipsoid, slightly compressed, 1.4–1.9 mm. Fl. Jul–Aug, fr. Sep. 2n = 68*.

Stony slopes. Heilongjiang (Da Hinggan Ling: Jingtao).


狭叶沙参 xia ye sha shen

Roots up to 40 cm. Stems single or several from one root, up to 80 cm tall, simple, usually glabrous, sometimes hispidulous. Basal leaf blade deltoid or rhombic-ovate, base shallowly cordate, margin crenate. Cauline leaves sessile; blade linear or less often lanceolate, 4.9–9 × 0.2–1.3 cm, glabrous, margin entire or serrate. Cymes single flowered, forming a pseudoraceme, or lower cymes several flowered, forming a very narrow panicule, or rarely with a solitary terminal flower. Hypanthium obovoid-oblong, glabrous or rarely scaberulous; calyx lobes linear-lanceolate, 4–10 × 1.5–2 mm. Corolla blue or pale purple, broadly campanulate, 1.6–2.8 cm; lobes ovate-triangular, 6–8 mm, less often deltoid and only ca. 4 mm. Disk cylindrical, 1.3–3.5 mm, glabrous or sparsely hairy. Style slightly shorter than, rarely as long as corolla. Capsule ellipsoid, 8–13 × 4–7 mm. Seeds yellow-brown, ellipsoid, ca. 1.8 mm. Fl. Jul–Sep, fr. Aug–Oct. 2n = 34, 68.

Forests, thickets, communities of tall herbs, meadows, grassy slopes; below 2600 m. Hebei, Heilongjiang, W Jilin, Liaoning, E, N,
and SE Nei Mongol, C and N Shanxi [Korea, E Mongolia, Russia (Far East, SE Siberia)].

1a. Plants (incl. hypanthium) often hispidulous; leaf blade broadly linear to ovate-lanceolate, adaxially scabrous, margin serrate; stems often single; flowers usually several .............. 19c. subsp. nystroemii

1b. Plants (incl. hypanthium) glabrous, sometimes stems hispidulous at base; leaf blade narrowly linear, narrowly ovate, deltoid-oblanceolate, or obovate, adaxially smooth, margin entire or serrate; stems several; flowers more numerous.

2a. Plants mostly more than 1 m tall, commonly puberulent only on lower part of stems and lower leaves; leaf blade mostly broadly linear to narrowly ovate, serrate; calyx lobes 5–12 × 1.3–3 mm. Fl. and fr. Sep. 2n = 68*.

Communities of tall herbs, thickets, forests. Heilongjiang (Hailin, Huanan, Jiamusi) [Russia (Far East)].


山西沙参 shan xi sha shen


- Grassy slopes, thickets; below 2600 m. Hebei (Neiqiu), SE Nei Mongol (Zhuozi), C and N Shanxi.


泡沙参 pao sha shen

Stems often single, 30–100 cm tall, simple, usually densely, less often sparsely retorsely hispidulous, very rarely subglabrous. Cauline leaves sessile or shortly petiolate; blade obovate, ovate-elliptic, or oblong (occasionally linear-elliptic or linear), 2–7 × 0.5–4 cm, both surfaces hispidulous, base obtuse or cuneate, margin with 2 to several large teeth, apex obtuse, acute, or shortly acuminate. Inflorescences usually with branches at base, forming a panicle, sometimes with only several flowers glomerate into a pseudoraceme; pedicels less than 1 cm. Hypanthium obovoid or globose-obovoid, glabrous, base rounded or ± obtuse; calyx lobes triangular-subulate, 3–9 mm, margin with 1 or 2 pairs of long denticles. Corolla purple, blue, or blue-purple, rarely white, campanulate, 1.5–2.5 cm; lobes obovate-deltoid, 5–8 mm. Disk tubular, 2–2.6 (–3) mm, hairy at least at apex. Style nearly as long as or slightly longer than corolla. Capsule globose-ellipsoid or ellipsoid, 7–11 × 4–6 mm. Seeds brown-yellow, ellipsoid, ca. 1.4 mm, 1-ribbed. Fl. Jul–Oct, fr. Oct–Nov. 2n = 34*, 102*.

- Sunny gravelly slopes, among grasses on shaded slopes, scrub, sparse woods, rocky places or rock crevices, less often forests; below 3100 m. Gansu, Hebei, Henan, SW Liaoning, SE Nei Mongol, Ningxia, E Qinghai, Shaanxi, Shanxi, W Sichuan.

1a. Cauline leaves sessile, lower ones rarely shortly petiolate .................... 20a. subsp. potaninii

1b. Cauline leaves usually petiolate, though sometimes very shortly so

................................................. 20b. subsp. wawreana

20a. Adenophora potaninii subsp. potaninii

泡沙参(原亚种) pao sha shen (yuan ya zhong)

Adenophora bockiana Diels; A. polydentata P. F. Tu & G. J. Xu; A. potaninii var. bockiana (Diels) S. W. Liu.

Cauline leaves sessile, lower ones rarely shortly petiolate.
● Sunny grassy slopes, though sometimes petiole very short; blades varying greatly, from linear to ovate, even on same individual.

● Among grasses on shaded slopes, scrub, sparse woods, mostly in stony places or rock crevices; below 2000 m. Hebei (N to Weichang), Henan (Song Shan), SW Liaoning, SE Nei Mongol (Hohhot, Liang-cheng, Zhaozi), Shanxi (E of Jiaocheng, Wuzhai, Yuncheng).


多歧沙参 duo qi sha shen


Cauline leaves usually petiolate, though sometimes petiole very short; blades varying greatly, from linear to ovate, even on same individual.

- Among grasses on shaded slopes, scrub, sparse woods, mostly in stony places or rock crevices; below 2000 m. Hebei (N to Weichang), Henan (Song Shan), SW Liaoning, SE Nei Mongol (Hohhot, Liang-cheng, Zhaozi), Shanxi (E of Jiaocheng, Wuzhai, Yuncheng).


锯齿沙参 ju chi sha shen

*Campanula tricuspidata* Fischer ex Schultes, Syst. Veg. 5: 158. 1819; *Adenophora communis* Fischer var. *denticulata* (Fischer) Trautvetter; *A. denticulata* Fischer; *A. polymorpha* Ledebour var. *denticulata* (Fischer) Trautvetter ex Herder; *C. denticulata* (Fischer) Sprengel (1824), not Burchell (1822).

Stems single or sometimes 2 from one root, 70–100 cm tall, simple, glabrous. Cauline leaves sessile, glabrous; blade narrowly elliptic or ovate-elliptic, 2.5–8 × 0.6–2 cm, base obtuse or cuneate, margin serrate, apex acute. Inflorescence branches (cymes) extremely short, only 2–3 cm, with 2 to several flowers, several forming a narrow panicule; pedicels very short. Hypanthium globose-obovoid, or globose-oblanceolate, 3–6 × 1–2 mm, overlapping at base, margin with 2 or rarely 3 or 4 pairs of long denticles, apex acuminate. Corolla blue or purple-blue, narrowly campanulate or tubular-campanulate, 1.5–2 cm; lobes obvate-deltoid, ca. 1/2 as long as tube. Disk annular or shortly tubular, less than 1.2 mm, glabrous. Style 2–2.5 mm, ca. 5 mm longer than corolla. Capsule globose-ellipsoid, 7–8 × 4–5 mm. Fl. Aug–Oct, fr. Sep–Oct.

- Thickets, rocks by streams; below 1600 m. Chongqing (Cheng-kou), Gansu (Kangxian, Wenzian), Guizhou (Renhuai), W Hubei (He-feng, Shennongjia), Shaanxi (Nanzheng), Sichuan (Emei Shan, Jiange, Tianquan).


扫帚沙参 sao zhou sha shen

*Adenophora mongolica* A. I. Baranov; *A. stenophylla* var. *denudata* Kitagawa.

Stems numerous from one root, 25–50 cm tall, often with slender branches, densely hispidulous or glabrous. Basal leaf blade ovate-orbicular, base rounded. Cauline leaves sessile; blade needledike to linear-oblong, up to 6 × 0.5 cm, glabrous or hispidulous, margin entire or sparsely serrate. Inflorescence branches slender, erect, forming a narrow panicule, rarely only several flowers in a pseudoraceme; pedicels slender. Hypanthium obovoid-oblong, glabrous; calyx lobes subulate, 3–4 mm, margin entire or with 1 or 2 pairs of verrucose denticles. Corolla blue or purple-blue, campanulate, 8–13 mm; lobes ovate-triangular, 3–3.5 mm. Disk tubular, 1–1.5 mm, glabrous or sparsely puberulent. Style slightly shorter than corolla. Capsule ellipsoid, 4–8 × 2.3–5 mm. Seeds brown-yellow, ellipsoid, slightly compressed, ca. 1 mm. Fl. Jul–Sep, fr. Sep. 2n = 34*.

- Dry grasslands. Heilongjiang (Anda), W Jilin, Nei Mongol (Jarud Qi) [Mongolia].


狭长花沙参 xia chang hua sha shen

*Adenophora vutaensis* Hurusawa.

Root carrotlike, 8–18 × 1.4–2.4 cm. Stems single, 20–120 cm tall, simple, glabrous or sometimes puberulent. Cauline leaves very rarely opposite, sessile or lower leaves sometimes with short winged petiole; blade broadly elliptic, elliptic, narrowly elliptic, lanceolate, or oblancoate, 2–8 × 0.5–2.5 cm, glabrous, base rounded, obtuse, or cuneate, margin crenate or serrate, apex acute or less often acuminate. Flowers usually several in a pseudoraceme, sometimes solitary and terminal, or very rarely with short branches, forming a narrow panicule; pedicels usually less than 1 cm. Hypanthium narrowly obovoid or obconic, glabrous; calyx lobes narrowly triangular, 5–10 × 1–1.5 mm, margin with 1 or 2 pairs of denticles or entire. Corolla blue or purple-blue, narrowly campanulate or tubular-campanulate;
late, less often campanulate, 2–3.5 cm; lobes deltoid, 5–10 mm.
Disk tubular, 1.6–2.8 mm, glabrous. Style shorter than corolla.
Capsule ellipsoid or oblong, 10–14 × 5–7 mm. Seeds yellow-
brown, ellipsoid, ca. 1.5 mm. Fl. Jul–Sep, fr. Sep. 2n = 68*.

- Grassy slopes; 1700–3000 m. W Hebei, SE NE Mongol (Zhuo-
zhi), Shaxi (Wutai Shan).


云南沙参 yun nan sha shen

Campanula khasiana J. D. Hooker & Thomson, J. Proc.
Linn. Soc., Bot. 2: 25. 1857; Adenophora albescens C. Y. Wu;
A. bulleyana Diels; A. bulleyana var. angustifolia C. Y. Wu; A.
chionantha C. Y. Wu; A. dimorphophylla C. Y. Wu; A.
diplodonta Diels; A. likiangensis C. Y. Wu; A. roseiflora C. Y.
Wu.

Root carrotlike, 7–8 × 1.5–1.6 cm. Stems often single or
sometimes 2 from one root, up to 1 m tall, simple, usually his-
sute. Cauline leaves sessile or shortly petiolate; blade ovate-or-
bicular, ovate, obovate, or elliptic, 3–9 × 1.5–6.5 cm, abaxially
rather densely hirsute (sometimes only along veins), adaxi-
ally scaberulous, base cuneate, margin serrate or irregularly biser-
rate, apex acute or acuminate; petiole if present up to 2 cm.
Inflorescence a narrow panicule with short branches or a pseudo-
caceme of several flowers; pedicels short. Hypanthium cam-
panulate, glabrous or rather densely hispidulous; calyx lobes
narrowly triangular, 5–7 × 1–1.5 mm, margin with 1–4 pairs of
denticles. Corolla blue or blue-purple, campanulate, 1.3–4
mm; lobes ovate-deltoid, 6–11 mm, ca. 1/2 as long as tube. Disk
shortly tubular, less than 1 mm. Style slightly longer than corolla to obviously
exserted. Fl. Aug–Oct. 2n = 34.

- Forests, forest margins, glades; 1200–4000 m. SW Sichuan,
Yunnan.

1895.

甘孜沙参 gan zi sha shen

Adenophora atuntzensis C. Y. Wu; A. forrestii Diels; A.
forrestii var. handeliana Nannfeldt; A. forrestii var. intercedens
Pax & K. Hoffmann; A. microcodon C. Y. Wu; A. pumila P. C.
Tsoong.

Root to 1 cm in diam. Caulexes sometimes with hori-
zontal branches. Stems (1 or)2 to several, mostly in lower
half, sparsely villous or rarely glabrous. Cauline leaves ses-
sile or shortly winged-petiolate; blade ovate-orbicular, elliptic,
lanceolate, or linear-lanceolate, 2.8–8 × 0.2–1.8 cm, both surfaces
usually puberulent or rarely glabrous, base cuneate or attenuate,
margin entire, crenulate, or serrate, apex acute or acuminate.
Flowers terminal and solitary, or several in a pseudacaceme;
pedicels short. Hypanthium obconic, base puberulent or sometimes
obtuse, glabrous; calyx lobes narrowly triangular, 5–10 × 1.5–
1.7 mm, margin with several verrucose denticles and sometimes
sparsely ciliate. Corolla blue or purple-blue, bowl-shaped, 1.3–
2.2 cm; lobes deltoid-orbicular, 1/2–2/3 as long as tube. Disk
annular, 0.5–1 mm high. Style 13–15 mm, shorter or sometimes
longer than corolla. Capsule ellipsoid, 8–11 × 5–6.5 mm. Seeds
yellow-brown, ca. 1 mm. Fl. Jul–Sep, fr. Sep. 2n = 34*.

- Meadows, grassy places at forest margins; 3000–4700 m. W
Sichuan, E Xizang (Jinon, Jonma), NW Yunnan (Dêqên, Zhongdian).

burgh 5: 173. 1912.

天蓝沙参 tian lan sha shen

Adenophora bulleyana Diels var. alba C. Y. Wu; A.
coelestis var. stenophylla Diels ex C. Y. Wu; A. huangiae C. Y.
Wu; A. megalantha Diels; A. ornata Diels; A. ornata var. alba
C. Y. Wu; A. pachyrhiza Diels; A. raphanorrhiza C. Y. Wu.

Caudexes sometimes with horizontal branches. Stems 1 or
2 from a rootstock, usually 50–80 cm tall, simple, usually
densely leafy in lower half, glabrous to rather densely hispid.
Cauline leaves sessile or sometimes lower ones shortly petio-
late; blade ovate-homibic, obovate, ovate, or linear-lanceolate,
2–10 × 0.5–3 cm, abaxially often hispidulous along veins, adaxi-
ally sparsely hispidulous, margin irregularly serrate. Flowers in a
pseudacaceme, or sometimes inflorescence with branches of 1 to
several flowers at top; pedicels short. Hypanthium globose-
ovoibod or obovoid-obconic, glabrous; calyx lobes narrowly
triangular, 8–20 × 1–1.5(–2) mm, margin with 1 to several pairs
of denticles. Corolla blue or blue-purple, campanulate, 1.5–4
cm; lobes ovate-deltoid, 6–11 mm, ca. 1/2 as long as tube. Disk
(1.2–)2–3(–3.5) mm, glabrous or sometimes hairy. Style shorter
than corolla. Fl. Aug–Oct. 2n = 102*.

- Forests, forest margins, glades; 1200–4000 m. SW Sichuan,
Yunnan.


鄂西沙参 e xi sha shen

Stems single, erect, 50–120 cm tall, simple, glabrous or
puberulent. Cauline leaves sessile or shortly petiolate; blade
lanceolate or elliptic-lanceolate, 5–12 × 1.5–3 cm, both surfaces
± puberulent or sometimes glabrous, base cuneate or obtuse,
margin serrate, apex acuminate. Inflorescence branches ascend-
ing, long, slender, forming a panicle; pedicels slender, up to
1.5 cm. Hypanthium obovoid or obovoid-ellipsoid, glabrous;
calyx lobes subulate, 4–8 × ca. 0.5 mm, margin with 2 or 3
pairs of denticles. Corolla blue-purple or pale blue, campanu-
late, 13–18 mm; lobes ovate-deltoid, 4–5 mm. Disk tubular,
1.8–3.2 mm, glabrous. Style 20–22 mm, exserted by 4–7 mm.

- Grassy slopes, scrub, rocks in forests; 1900–2600 m. W Hubei
(Shennongjia).

Univ. Tokyo 30(1): 165. 1911.

台湾沙参 tai wan sha shen

Caudexes with horizontal branches bearing alternate mem-
branous scales. Stems 1 to several from one root, 10–30 cm tall,
simple, sometimes branched at middle, glabrous or sparsely hirsute. Basal leaf blade ovate-deltoid, base truncate. Cauline leaves sessile, lower ones with petiole up to 1 cm; blade linear-lanceolate or elliptic, 3–8 × 0.4–2.5 cm, both surfaces glabrous or sparsely puberulent, base cuneate, margin crenate or dentate, apex acuminate. Flowers 1 or 2 and terminal or more in a pseudoraceme, or several pseudoracemes forming a narrow panicule; pedicels elongate, 1.5–3 cm; lobes deltoid, ca. 1/2 as long as tube. Disk annular, less than 1 mm high. Style shorter than corolla. Capsule ellipsoid, 10–16 × 6–7 mm. Seeds yellow-brown, ellipsoid, 1.2–1.5 mm, 1-ribbed. Fl. Jul–Nov, fr. Sep–Nov. 2 Capsule ellipsoid, 10–16 × 6–7 mm. Seeds yellow-brown, ellipsoid, 1.2–1.5 mm, 1-ribbed. Fl. Jul–Nov, fr. Sep–Nov. 2

29a. Adenophora morrisonensis subsp. morrisonensis

台湾沙参 (原亚种) tai wan sha shen (yuan ya zhong)

Plants glabrous or sparsely pubescent. Flowers several to many, in a pseudoraceme or narrow panicule.

- Forest or thicket margins; 700–3000 m. Taiwan.

29b. Adenophora morrisonensis subsp. uehatae (Yamamoto)

玉山沙参 chang bai sha shen


Plants hisrate. Flowers 1 or 2, terminal.

- Shaded scree; 3000–3500 m. Taiwan.


宁夏沙参 ning xia sha shen

Stems several from one root, erect, 30–50 cm tall, simple, glabrous or less often scaberulous. Basal leaves cordate or obovate; cauleine leaves alternate, sessile or with petiole extremely short and cuneate; blade usually lanceolate, less often ovate-lanceolate or linear, 2–5 × 0.2–1.8 cm, both surfaces glabrous, margin dentate or irregularly serrate. Flowers several in a pseudoraceme, or numerous in a large panicule due to having long inflorescence branches; pedicels slender, 0.5–1.5 cm. Calyx glabrous; tube obovoid or obovoid-conical; lobes subulate or subulate-lanceolate, 2–6 × ca. 1 mm, margin mostly with 1 pair of verrucose denticles, very rarely entire. Corolla blue or blue-purple, narrowly campanulate, 1.4–1.6 cm; lobes ovate-deltoid, ca. 3.5 mm. Disk tubular, 2–2.5 mm, glabrous. Style 1.6–1.8 cm, slightly longer than corolla. Capsule narrowly ellipsoid, ca. 8 × 3 mm. Seeds yellow, ellipsoid, ca. 2 mm. Fl. Jul–Aug, fr. Sep.

- Shaded slopes, scrub in ravines, rock crevices; 1600–2400 m. Gansu (?Lanzhou), Nei Mongol (ib Ju Meng: Qianli Shan), Ningxia (Helan Shan).

31. Adenophora pereskiifolia (Fischer ex Schultes) Fischer ex G. Don in Loudon, Hort. Brit. 75. 1830 ["pereskiaefolia"]

Campanula pereskiifolia Fischer ex Schultes, Syst. Veg. 5: 116. 1819 ["pereskiaefolia"]; Adenophora communis Fischer var. latifolia (Fischer) Trautvetter; A. curvidens Nakai; A. latifolia Fischer; A. pereskiifolia subsp. alternifolia (P. Y. Fu ex Y. Z. Zhao) C. X. Fu & M. Y. Liu; A. pereskiifolia var. alternifolia P. Y. Fu ex Y. Z. Zhao; A. pereskiifolia var. angustifolia Y. Z. Zhao; A. pereskiifolia var. curvidens (Nakai) Kitagawa; A. pereskifolia f. puberula Kitagawa; A. pereskifolia subsp. subalpina A. I. Baranov; A. polymorpha Nakai subsp. subalpina (A. I. Baranov) Kitagawa; A. polymorpha Ledebour var. latifolia (Fischer) Trautvetter; A. polymorpha var. pereskiifolia (Fischer ex Schultes) Makino.

Root carrot-shaped, 6–9 × 1.5–1.9 cm. Stems simple, up to 1 m, simple, glabrous, less often retrorsely hispidulous. Cauline leaves (all or some) 3–5-verticillate or -subverticillate, rarely all alternate or nearly so, sessile or shortly petiolate; blade elliptic, ovate, lanceolate, or narrowly lanceolate, 3.5–16 × 0.6–4.2 cm, both surfaces glabrous, base cuneate or obtuse, margin coarsely serrate, apex acute or acuminate. Inflorescence pyramidal, with cymes alternate, short, and suberect, or flowers sometimes relatively few, forming a pseudoraceme. Hypanthium obovoid, obconic, or ellipsoid, glabrous or verrucose; calyx lobes lanceolate or narrowly triangular, 3–6 × 0.8–2 mm. Corolla blue-purple or blue, funnelform-campanulate, 1.3–2 cm; lobes deltoid or depressed triangular, 3–8 × 6–7.5 mm. Disk annular to shortly tubular, 0.5–1.5 mm. Style 1.5–2.4 cm, ± exserted. Capsule obovoid, ellipsoid, or subglobose, 6–8 × 4–5 mm. Seeds dark brown, glossy, ellipsoid, slightly compressed, 1.8–2 mm, smooth. Fl. Jul–Aug, fr. Aug–Sep. 2n = 34, 68, 72.

Meadows, forest margins, grassy places in forests; below 1000 m. Heilongjiang, Jilin [Japan, Korea, E Mongolia, Russia (Far East, Siberia)].


展枝沙参 zhao zhi sha shen


Roots 1.5–3.5 cm in diam. Stems simple, up to 1 m tall, simple, ± white villous, rarely glabrous. Cauline leaves 3–5-verticillate, sessile; blade rhombic, broadly elliptic, elliptic, elliptic-lanceolate, or lanceolate, 3.5–11 × 1.5–6 cm, both surfaces glabrous or hispidulous along veins, base obtuse or

长柱沙参 chang zhu sha shen

Root carrotlike, up to 10 × 0.7–0.8 cm. Stems several, caespitose, 40–120 cm, sometimes branched above, usually finely scaberulous. Basal leaves petiolate; blade cordate or truncate at base, margin deeply and irregularly serrate. Cauline leaves sessile; blade filiform, linear, elliptic, lanceolate, or ovate, 2–10 × 0.1–2 cm, both surfaces scaberulous or subglabrous, margin entire or sparsely serrulate. Inflorescence a pseudoraceme or a panicle. Hypanthium obvoid, elliptoid, or campanulate, glabrous; calyx lobes subulate or narrowly triangular, 1.5–5(–7) mm, margin entire or denticulate. Corolla pale to dark blue, purple, or purple, subtubular or tubular-campanulate, 10–17 × 5–8 mm. Disk narrowly tubular, 4–7 mm, glabrous or villous. Style 1.8–2.2 cm. Capsule ellipsoid, 7–9 × 3–6 mm. Fl. Jul–Sep, fr. Aug–Sep. 2n = 34∗.

Conifer forests, scrub, grasslands, grassy slopes, sandy places; below 4000 m. Gansu, Hebei, W Jilin, Ningxia, NE Qinghai, N Shaanxi, Shanxi [Mongolia, Russia (Far East, S Siberia)].

1a. Calyx lobes 1.5–3(–4) mm; corolla 10–13 mm, subtubular, lobes 1.5–3 mm; style 6–10 mm longer than corolla ......................... 35a. subsp. stenanthina

1b. Calyx lobes 3–5(–7) mm; corolla 12–17 mm, tubular-campanulate, lobes 3–4.5 mm; style 3–7 mm longer than corolla ......................... 35b. subsp. sylvestrica

35a. Adenophora stenanthina subsp. stenanthina

长柱沙参(原亚种) chang zhu sha shen (yuan ya zhong)

Campanula stenanthina Ledebour, Mém. Acad. Imp. Sci. St. Pétersbourg Hist. Acad. 5: 525. 1814; Adenophora collina Kitagawa; A. collina f. latifolia Kitagawa; A. coronata (Ker Gawler) A. Candolle; A. crispatula (Turczaninow ex Kitagawa) Kitagawa; A. marsupiflora (Schultes) Fischer; A. marsupiflora var. crispatula Turczaninow ex Kitagawa; A. marsupiflora var. jaluensis Komarov; A. polymorpha Ledebour var. marsupiflora (Schultes) Franchet; A. pratensis Y. Z. Zhao; A. stenanthina var. angustilanceifolia Y. Z. Zhao; A. stenanthina var. collaris (Kitagawa) Y. Z. Zhao; A. stenanthina f. crispatula (Turczaninow ex Kitagawa) Kitagawa; A. stenanthina var. crispatula (Turczaninow ex Kitagawa) Y. Z. Zhao; A. verticillata Pallas ex Fischer var. marsupiflora (Schultes) Trautvetter; C. coronata Ker Gawler; C. marsupiflora Schultes.

Leaves up to 12 mm wide. Calyx lobes 1.5–3 mm. Corolla subtubular, 10–13 mm, ± constricted at throat; lobes 1.5–3 mm. Style 6–10 mm longer than corolla. Disk glabrous or hairy. Capsule narrowly ellipsoid.
Grassy slopes, sandy places; below 1800 m. Gansu (Huining), Hebei (Kangbao, Longguan, Zhangbei), W Jilin (Zheli), NE Mongolia, Ningxia (Guyuan, Yanchi), N Shaanxi, Shanxi (N of Taigu) [Mongolia, Russia (Far East, S Siberia)].


林沙参 lin sha shen

Leaves linear to ovate or oblong, up to 2 cm wide, entire or sparsely serrulate. Calyx lobes 3–5(–7) mm. Corolla tubular-campanulate, 12–17 mm; lobes 3–4.5 mm. Style only 3–7 mm longer than corolla. Disk all hairy. Capsule ellipsoid.

● Conifer forests, scrub, also among grasses; 2500–4000 m. Gansu (Qilian Shan, Tao He basin), NE Qinghai.


川藏沙参 chuan zang sha shen

Adenophora gracilis Nannfeldt.

Stems often single, 30–100 cm tall, simple, usually hisrute, less often glabrous. Basal leaves long petiolate; blade ovate, base cordate, margin coarsely serrate. Cauline leaves sessile; blade ovate, lanceolate, elliptic, or linear, 2–11 × 0.4–3 cm, abaxially hispidulous but hisrute along major veins (or less often glabrous throughout), axadially glabrous or hispidulous, base cuneate or attenuate, margin entire or sparsely serrate, apex acuminate. Inflorescence a narrow panicule with short branches, sometimes only several flowers in a pseudoraceme. Hypanthium ellipsoid, globose, or ovoid. Fl. Jul–Oct, fr. Sep–Oct.

37a. Adenophora capillaris subsp. capillaris

川沙参 si lie sha shen

Adenophora gracilis var. temuifolia Diels; A. longisepala P. C. Tsoong.


● Forests, forest margins, grasslands; 1400–2800 m. Chongqing, Guizhou, Hebei, Shanxi (S of Qin Ling), Sichuan (Butuo, E of Kangding, Yuexi).


细叶沙参 xi ye sha shen

Adenophora capillaris var. dentata Y. Z. Zhao; A. paniculata var. petiolata Y. Z. Zhao; A. paniculata var. pilosa Kitagawa; A.

37a. Adenophora capillaris subsp. capillaris

丝裂沙参 si lie sha shen (yuan ya zhong)

Adenophora capillaris var. temuifolia Diels; A. longisepala P. C. Tsoong.


● Forests, forest margins, grasslands; 1400–2800 m. Chongqing, Guizhou, Hebei, Shanxi (S of Qin Ling), Sichuan (Butuo, E of Kangding, Yuexi).

paniculata var. psilosa Kitagawa.

Stems glabrous or hirsute. Leaves from linear, lanceolate, or broadly elliptic, 0.2–7.5 cm wide, glabrous, sometimes adaxially sparsely hispidulous, abaxially sparsely hirsute. Calyx lobes (2–)3–5(–7) mm, margin entire. Corolla 10–14 mm. Capsule narrowly obovoid, ellipsoid, or oblong, 7–11 × 3–5 mm. Seeds 1.4–1.6 mm. Fl. Jun–Sep, fr. Aug–Oct.

- Grassy slopes; 1100–2800 m. Hebei (S of Longguan, Wuling Shan), W Henan, SE Nei Mongol (Daqing Shan, Tumd Qi, Xinghe), Shaanxi (Qin Ling), Shanxi.


轮叶沙参 lun ye sha shen

Campanula tetraphylla Thunberg in Murray, Syst. Veg., ed. 14, 211. 1784; Adenophora obtusifolia Merrill; A. polymorpha Ledebour var. rhombifolia H. Léveillé; A. polymorpha var. verticillata Franchet & Savatier; A. radiatfolia Nakai, nom. illeg. superfl.; A. radiatfolia var. abbreviata (H. Léveillé) Nakai; A. radiatfolia var. rhombifolia (H. Léveillé) Nakai; A. tetrphylla var. integrigolfa Y. Z. Zhao; A. triphylla (Thunberg) A. Candolle; A. triphylla f. linearis (Hayata) Kitamura; A. triphylla var. tetrphylla (Thunberg) Makino; A. verticillata Fischer; A. verticillata var. abbreviata H. Léveillé; A. verticillata f. linearis (Hayata) Matsumura; A. verticillata var. linearis Hayata; A. verticillata f. triphylla (Thunberg) Makino; A. verticillata var. triphylla (Thunberg) Regel; Campanula triphylla Thunberg; C. verticillata Pallas (1773), not Hill (1765).

Root carrotlike, 7–16 × 1.5–1.8 cm. Stems up to 1.5 m tall, simple, glabrous, less often white hispidulous. Cauline leaves 3–6-verticillate, sessile or subsessile; blade broadly to narrowly elliptic, linear-lanceolate, or linear, 1.8–10 × 0.2–3.2 cm, both surfaces sparsely puberulent or glabrous, base cuneate or attenuate, margin serrate or serrulate, apex acuminate, acute, or obtuse. Inflorescence a narrow panicle with branches (cymes) mostly verticillate. Hypanthium obconic or campanulate, glabrous; calyx lobes subulate, linear, or linear-triangular, 1.5–4 mm, margin entire. Corolla blue to purple, tubular or narrowly funnelform, sometimes slightly constricted at throat, 7–10 mm; tube 2.5–7 mm in diam.; lobes deltoid, 1–2 mm. Disk narrowly tubular, 2–4 mm. Style 14–20 mm, strongly exserted. Capsule obovoid or broadly obovoid, 5–8 × 3–6 mm. Seeds yellow-brown, oblong, slightly compressed, 1–1.5 mm. Fl. (Feb–)Mar–Nov, fr. May–Nov. 2n = 34, 34+2B*.

Grassy places, scrub; low elevations but up to 2000 m in south. Anhui, Fujian, N Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan (Lushi, Xinyang), Hunan (Xinning, Ziyang), Jiangsu, Jiangxi, Jilin, Liaoning, E Nei Mongol, Shandong (Muping), Shanxi (Lingkong Shan), Sichuan (Ebian, Emei Shan), Taiwan, Yunnan (Yanshan), Zhejiang [Japan (including Ryukyu Islands), Korea, Laos, Russia (Far East, E Siberia), N Vietnam].