
梅花草属 mei hua cao shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Ulla-Maj Hultgärd

Herbs perennial, glabrous. Rhizome sympodial, robust. Stems (scapes) 1 to several, 1- or 2- or several leaved, rarely leafless. Basal leaves 2 or several, forming a rosette; stipules membranous; petiole usually long; leaf blade entire. Cauline leaves 1 to several or absent, often sessile and semiamplexicaul. Flower solitary, terminal; hypanthium free or fused with ovary proximally. Sepals 5, usually imbricate. Petals 5, imbricate, white or yellowish, rarely greenish, margin fimbriate, erose, or entire. Stamens 5, inserted opposite sepals, a few species with anther connective projected into a lanceolate appendage; staminodes 5, inserted opposite petals, terete and entire or flat and divided into lobes or filiform rays, apically somewhat glandular or with a distinct, globose gland. Pistil 1; ovary superior or semi-inferior, 1-loculed; placentation parietal; ovules numerous. Fruit a capsule, superior or semi-inferior, sometimes longitudinally angled, loculically dehiscent on abaxial suture into 3 or 4 valves. Seeds numerous, brown, obovoid or oblong, very small, 1–2 mm; testa thin, membranous, reticulate, smooth; endosperm thin or absent.

About 70 species: temperate regions of the N hemisphere, mainly in S and SE Asia; 63 species (49 endemic) in China.

Key 1

1a. Staminodes 3–5- or 7–23-branched, branches with globose glands at apex.

2a. Staminodes 7–23-branched .................................................................................................. 63. P. palustris

2b. Staminodes 3- or 5-branched.

3a. Staminodes 3-branched; cauline leaves 2 or more.

4a. Leaf blade broadly oblanceolate to narrowly ovate; petals rhomboid, margin subentire or undulate 53. P. rhombipetala

4b. Leaf blade reniform; petals not rhomboid, margin fimbriate proximally or throughout.

5a. Petal margin fimbriate proximally; cauline leaves 3–6 ......................................................... 54. P. amoena

5b. Petal margin fimbriate throughout; cauline leaves 2–8.

6a. Petals oblanceolate or oblong, marginal fimbriae turgid at apex, becoming clavate; cauline leaves usually 2–5 .......................................................... 55. P. noemiae

6b. Petals ovate or triangular-ovate, marginal fimbriae not turgid at apex; cauline leaves usually more than 3 .................................................................................................................. 56. P. foliosa

3b. Staminodes (3–)5(or 7)–branched; cauline leaf 1.

7a. Petal margin fimbriate throughout; staminodes divided for 1/3–1/2 their length.

8a. Leaf blade ovate-cordate, thick textured, base cordate ............................... 61. P. perciliata

8b. Leaf blade ovate or reniform, thin textured, base often truncate or subcordate 62. P. davidii

7b. Petal margin slightly undulate, or fimbriate proximally and undulate or entire distally; staminodes divided for up to 1/2 their length or more.

9a. Petal margin slightly undulate; basal leaf blade ovate to oblong-ovate 57. P. guilinensis

9b. Petal margin fimbriate proximally, undulate or entire distally; basal leaf blade ovate-cordate to broadly orbicular.

10a. Basal leaf blade broadly orbicular, obviously wider than long ............................ 60. P. longshengensis

10b. Basal leaf blade ovate-cordate, about as long as wide.

11a. Staminodes divided nearly to base ............................................................... 58. P. gansuensis

11b. Staminodes divided for ca. 1/2 their length .......................................................... 59. P. simaoensis

1b. Staminodes terete and divided at apex or not, or flat and 5–7-dentate or 2- or 3- or 5-lobed at apex, apex usually eglandular.

12a. Staminodes terete, apex divided or not.

13a. Staminodes terete, apex 2-lobed and ± 2-labiate.

14a. Basal leaf blade 6–15 mm, broadly obovate, broadly ovate, or broadly rhomboid-ovate; staminodes 2-lobed, posterior lobes 2- or 3-lobed ........................................... 11. P. faberi

14b. Basal leaf blade 2–3 mm, rhomboid, ovate-rhomboid, or suborbicular; staminodes 2-lobed, posterior lobes 2–5-lobed ........................................................................................................... 12. P. labiata

13b. Staminodes terete, apex entire, rounded or discoid.

15a. Basal leaves numerous, forming a rosette.

16a. Petals broadly elliptic; staminodes knoblike at apex; sepals oblong; cauline leaf borne near middle of stem ................................. 9. P. petitmenginii
16b. Petals narrowly obovate-spatulate; staminodes sublingulate at apex; sepals lanceolate; cauline leaf
borne near apex of stem ................................................................. 10. *P. esquirolii*

15b. Basal leaves few, 3–5(–8), not forming a rosette.
17a. Basal leaf blade reniform or deeply cordate, rarely cordate at base; petals green.
18a. Plants 15–30 cm tall; petals lanceolate to oblong-lanceolate, 14.5–22.5 × 4.5–5.5 mm; leaf blade
2–6 × 5–9.5 cm .................................................................................. 1. *P. longipetala*
18b. Plants 5–11 cm tall; petals broadly obovate, 4–8 × 3–6 mm; leaf blade 0.8–2.5 × 1.3–3 cm  2. *P. tenella*

17b. Basal leaf blade ovate-cordate, ovate-reniform, or ovate-triangular, cordate or attenuate at base;
petals white or green.
19a. Petals green or yellow-green.
20a. Petals yellow-green; cauline leaf cordate-reniform; basal leaf blade ovate-reniform  5. *P. longipetaloides*
20b. Petals green; cauline leaf oblong or ovate-lanceolate; basal leaf blade ovate-cordate or
ovate-reniform.
21a. Petals densely purple-brown punctate; staminodes rounded at apex; basal leaf blade ±
ovate-cordate ...........................................................................................................  3. *P. angustipetala*
21b. Petals not punctate; staminodes truncate or emarginate at apex; basal leaf blade mostly
ovate-reniform .............................................................................................................  4. *P. yulongshanensis*

19b. Petals white or yellowish.
22a. Petals minutely purple-brown punctate, often emarginate at apex; staminodes often
indistinctly 3-crenate at apex or entire ............................................................................. 6. *P. yunnanensis*
22b. Petals not punctate, acute or rounded at apex; staminodes rounded at apex.
23a. Staminodes broad and flat; basal leaf blade ovate-cordate, base cordate; cauline leaf borne
near apex of stem, much smaller than basal leaves; petals yellowish ............................. 7. *P. yanyuanensis*
23b. Staminodes thin and long; basal leaf blade ovate-triangular, base attenuate; cauline leaf
borne near base of stem, slightly smaller than or subequaling basal leaves; petals white ......  8. *P. humilis*

12b. Staminodes flat, apex 5–7-dentate or (2 or)3(–5)-lobed, usually eglandular.
24a. Staminodes 5–7-dentate at apex.
25a. Petals broadly spatulate or obovate, margin erose or subentire, base with a claw ca. 1 mm wide;
leaf blade cuneate or subcordate at base ................................................................. 13. *P. degeensis*
25b. Petals triangular-ovate, margin long fimbriate proximally, base with a long claw; leaf blade
deply cordate at base ...........................................................................................................  14. *P. farreri*

24b. Staminodes (2 or)3(–5)-lobed at apex.
26a. Staminodes 2- or 5-lobed at apex.
27a. Staminodes 2-lobed at apex, lobes subequal; cauline leaves 2 ............................................. 46. *P. bifolia*
27b. Staminodes 5-lobed at apex, lobes equal or unequal; cauline leaf 1.
28a. Petal margin sparsely and shortly fimbriate throughout; stem not more than 10 cm .... 52. *P. omeiensis*
28b. Petal margin long fimbriate proximally; stem more than 10 cm. 53.
29a. Staminodes 5-lobed or 5-parted at apex, lobes unequal.
30a. Petals yellow-white; leaf blade reniform ............................................................. 50. *P. yiliangensis*
30b. Petals white; leaf blade ovate-cordate ............................................................. 51. *P. chengkouensis*
29b. Staminodes 5-lobed to middle, lobes subequal.
31a. Basal leaf blade oblong-cordate or broadly cordate ............................................ 49. *P. monochoriifolia*
31b. Basal leaf blade broadly cordate, broadly orbicular, or suborbicular.
32a. Basal leaf blade broadly orbicular, rarely suborbicular, usually wider than long, rarely
as wide as long; cauline leaf broadly ovate or reniform ............................................. 48. *P. dilatata*
32b. Basal leaf blade reniform, broadly cordate, or broadly ovate, about as wide as or wider
than long; cauline leaf similar in shape to basal ones ...................................................... 47. *P. wightiana*

26b. Staminodes 3(–5)-lobed at apex, lobes usually eglandular, rarely inconspicuously glandular at
apex.

33a. Connective of anther apically projected into a lanceolate appendage.
33b. Connective of anther not apically projected.
34a. Basal leaf blade ovate-cordate or ovate; staminodes 3-lobed for 1/4–1/3 their length, central lobe narrower than lateral ones; styles usually short, not exserted beyond staminodes, occasionally longer ......................................................... 43. *P. brevistyla*
34b. Basal leaf blade reniform or suborbicular; staminodes 3-lobed or -parted, lobes subequal; styles usually long, exserted beyond staminodes, rarely shorter.
35a. Staminodes 3-lobed to middle or almost so; basal leaf blade reniform or suborbicular 44. *P. delavayi*
35b. Staminodes 3-parted beyond middle; basal leaf blade reniform .......................... 45. *P. leptophylla*

36a. Cauline leaves absent.
36b. Cauline leaves 1 or 2.
37a. Staminodes lobed for ca. 1/3 their length, lobes narrow; petals yellow, apex emarginate or 2-lobulate; leaf with 3 parallel veins .......................................................... 15. *P. lutea*
37b. Staminodes lobed for ca. 1/5 their length, lobes short and broad, central one longer than lateral ones; petals white, apex rounded-obtuse; leaf usually with 5 parallel veins .......... 16. *P. scaposa*

38a. Cauline leaves 2 .............................................................. 42. *P. lijiangensis*
38b. Cauline leaf 1.
39a. Staminodes 3(–5)-lobed at apex, lobes unequal.
39b. Staminodes 3-lobed at apex, lobes unequal.
40a. Central lobe of staminode much shorter than lateral ones; petals greenish, narrowly oblong, margin sparsely and shortly fimbriate; cauline leaf borne distally on stem .......... 39. *P. cooperi*
40b. Central lobe of staminode longer than lateral ones; petals white, obovate, rarely subpatulate, margin entire; cauline leaf borne near base of stem ........................................... 40. *P. laxmannii*

41a. Petal margin long fimbriate proximally.
41b. Petal margin entire or shortly fimbriate and erose proximally.
42a. Basal leaf blade obovate or oblong-obovate .................................................. 41. *P. obovata*
42b. Basal leaf blade reniform, orbicular, broadly ovate- orbicular, ovate-cordate, or occasionally other shapes.
43a. Basal leaf blade ovate-cordate, 2–4.5 × 1.8–3.5 cm, thick textured, subleathery 19. *P. crassifolia*
43b. Basal leaf blade reniform, orbicular, or broadly ovate- orbicular, rarely ovate-cordate.
44a. Basal leaf blade orbicular or broadly ovate- orbicular, base cordate with a deep sinus, apex obtuse and apiculate; cauline leaf much smaller than basal ones; petals ob lanceolate, with 2 green, oblong glands near base, apex acute ....................... 17. *P. yui*
44b. Basal leaf blade reniform, rarely ovate-cordate, apex rounded, rarely subobtuse or emarginate; cauline leaf about as large as basal ones; petals obovate, eglundular, apex emarginate ................................................................. 18. *P. chinensis*

45a. Petal margin short fimbriate proximally.
45b. Petal margin entire or shortly fimbriate and erose proximally.
45a. Sepals and petals purple-brown punctate; petals 5–6 × 3–4 mm; basal leaf blade 9–10 × 8–9 mm .................................................................................. 21. *P. venusta*
45b. Sepals and petals not punctate; petals 7.8–9.5 × 5.2–6.1 mm; basal leaf blade 1–1.5 cm × 9–14 mm ........................................................................ 20. *P. epunctulata*

46a. Basal leaf blade oblong or elliptic, truncate or cuneate at base.
46b. Basal leaf blade oblong, 8–9 × 4–5 mm; petals spatulate ......................... 23. *P. filchneri*
47a. Ovary superior.
47b. Ovary inferior.
48a. Basal leaf blade ovate-reniform, -cordate, -oblong, or broadly ovate, cordate at base.
49a. Basal leaf blade oblong, 1.8–6 × 1–2.5 cm; petals suborbicular or elliptic 24. *P. xinganensis*
49b. Basal leaf blade elliptic, 1.8–6 × 1–2.5 cm; petals suborbicular or elliptic 24. *P. xinganensis*

50a. Petals green, lanceolate, margin minutely and densely purple punctate, densely erose, apex acuminate ...................................................... 25. *P. lanceolata*
50b. Petals white, obovate, margin sparsely erose or entire, apex rounded or cleft.
51a. Basal leaf blade ovate-reniform; plants not more than 4 cm tall .... 26. *P. kangdingensis*
51b. Basal leaf blade ovate-cordate, ovate-oblong, or broadly ovate, cordate at base.
52a. Basal leaf blade ovate-cordate, ovate-oblong, or broadly ovate, cordate at base.
52b. Basal leaf blade ovate-reniform, -cordate, -oblong, or broadly ovate, cordate at base.
52b. Basal leaf blade ovate-cordate, ovate-oblong, or broadly ovate, cordate at base.
52b. Basal leaf blade ovate-reniform; plants not more than 4 cm tall .... 26. *P. kangdingensis*

52b. Petals rounded at apex; staminodes shallowly 3-lobed for ca. 1/6 their length.
53a. Plants 16–27 cm tall; basal leaf blade ovate-oblong or broadly ovate, deeply
cordate at base, 2–9-veined; staminodes 3(-6)-lobed, lobes truncate at apex, central one narrower than lateral ones ............................... 28. P. submysorensis
53b. Plants 7–10 cm tall; basal leaf blade ovate, densely brown punctate, with
5–7 arcuate veins; staminodes 3-lobed, lobes rounded at apex ......  29. P. cacuminum

47b. Ovary semi-inferior.
54a. Basal leaf blade ovate-cordate to reniform, base usually cordate.
55a. Stem usually more than 28 cm; basal leaf blade ovate-cordate, 3–4.1 cm, deeply
cordate at base ...........................................................................................................  30. P. cordata
55b. Stem usually 2–8 cm, occasionally to 20 cm; basal leaf blade not more than 2 cm.
56a. Petals pale yellow-green ....................................................................  22. P. qinghaiensis
56b. Petals white.
57a. Basal leaf blade reniform, rarely ovate-cordate; cauline leaf borne near
middle of stem; staminode lobes lanceolate .............................................................. 31. P. pusilla
57b. Basal leaf blade ovate-cordate; cauline leaf borne near base of stem;
staminode lobes oblong.
58a. Petals broadly obovate, purple punctate; stem less than 6 cm; basal leaf
petiole ca. 1 cm, leaf blade usually cordate at base ......................... 35. P. subscaposa
58b. Petals obovate, not or indistinctly punctate; stem 8–20 cm; basal leaf
petiole (1.5–)3–6 cm, leaf blade usually truncate at base ................. 36. P. deqenensis
54b. Basal leaf blade oblong, base not cordate.
59a. Stem relatively low; basal leaves small.
60a. Petals white; basal leaf petiole 8–15(–40) mm, leaf blade usually cuneate at
base ........................................................................................................... 37. P. trinervis
60b. Petals green; basal leaf petiole (1–)15–25 mm, leaf blade usually subcordate at
base ........................................................................................................  38. P. viridiflora
59b. Stem relatively tall; basal leaves large.
61a. Staminodes 3-parted for ca. 2/3 their length, lobes parallel, to 3.2 mm . 32. P. oreophila
61b. Staminodes 3-lobed for 1/5–1/4 their length.
62a. Staminodes broad, lobes linear, ca. 1 mm; petals yellow ......................... 33. P. tibetana
62b. Staminodes narrow, lobes lanceolate or ovate-lanceolate, ca. 1.5 mm; petals
white ..................................................................................................... 34. P. nubicola

Key 2
1a. Cauline leaves absent.
2a. Petals yellow, emarginate or 2-lobulate at apex; leaf blade with 3–5 parallel veins; staminodes 3-lobed
for ca. 1/3 their length, lobes equal, narrow .......................................................................... 15. P. lutea
2b. Petals white, rounded-obtuse at apex; leaf blade usually with 5 parallel veins; staminodes 3-lobed for
ca. 1/5
their length, central lobe longer than lateral ones ................................................................. 16. P. scaposa
1b. Cauline leaves 1–3 or more.
3a. Cauline leaves 2 or 3 or more.
4a. Cauline leaves 2- or 3-lobed and eglandular at apex.
5a. Staminodes 2-lobed at apex; stem 10–50 cm ........................................................................ 46. P. bifolia
5b. Staminodes 3-lobed at apex; stem 4–6 cm .........................................................................  42. P. lijiangensis
4b. Cauline leaves 3 or more; staminodes branched, branches with globose glands at apex.
6a. Petals rhomboid, margin subentire or undulate ............................................................ 53. P. rhombipetala
6b. Petals not rhomboid, margin fimbriate proximally or throughout.
7a. Petal margin fimbriate proximally .................................................................................. 54. P. amoena
7b. Petal margin fimbriate throughout.
8a. Petals oblanceolate or oblong, marginal fimbriae turgid at apex; staminode branches not
parallel; cauline leaves usually 2–5 ................................................................................. 55. P. noemiae
8b. Petals ovate or triangular-ovate, marginal fimbriae not turgid at apex; staminode branches
parallel;
cauline leaves usually more than 3 ........................................................................ 56. P. foliosa
b. Cauline leaf 1.

9a. Basal leaves 10 or more, cespitose.

10a. Staminodes entire and rounded at apex.

11a. Petals broadly elliptic; sepals oblong; cauline leaf borne near middle of stem ..........  9. P. petitmenginii

11b. Petals broadly oblanceolate; sepals lanceolate; cauline leaf borne near apex of stem ....  10. P. esquirolii

10b. Staminodes 2-lobed and 2-labiate at apex.

12a. Basal leaf blade broadly obovate, broadly ovate, or broadly rhomboid-ovate, 6–15 mm ......  11. P. faberi

12b. Basal leaf blade rhomboid, ovate-rhomboid, or suborbicular, 2–3 mm .........................  12. P. labiata

9b. Basal leaves usually 3–5(–12), not cespitose.

13a. Anther connective apically projected into a lanceolate appendage.

14a. Basal leaf blade ovate-cordate or ovate; staminodes 3-lobed for 1/4–1/3 their length, central lobe narrow, lateral ones wider; style short, not exserted beyond staminodes, occasionally longer .................................................................  43. P. brevistyla

14b. Basal leaf blade reniform or suborbicular; staminodes 3-lobed for 1/2 their length or slightly more:

15a. Staminodes divided for 2/5–1/2 their length; basal leaf blade reniform or suborbicular . 44. P. delavayi

15b. Staminodes divided for ca. 2/3 their length, basal leaf blade reniform .......................  45. P. leptophylla

13b. Anther connective not apically projected.

16a. Basal leaf blade elliptic, obovate, or broadly orbicular.

17a. Basal leaf blade elliptic or ovate.

18a. Basal leaf blade elliptic, rarely obovate-elliptic; staminodes 3-cleft at apex ............  24. P. xinganensis

18b. Basal leaf blade ovate or oblanceolate; staminodes 5-branched, branches globose glandular at apex ..........................................................................................................................  57. P. guilinensis

17b. Basal leaf blade obovate or broadly orbicular.

19a. Basal leaf blade densely purple-brown punctate, broadly orbicular, apex emarginate  60. P. longshengensis

19b. Basal leaf blade not punctate, obovate, oblanceolate, broadly orbicular, or suborbicular.

20a. Basal leaf blade obovate or oblanceolate, 2–4 × 1.5–2.6 cm; staminodes 3- or 4(or 5)-lobed for ca. 1/3 their length .................................................................  41. P. obovata

20b. Basal leaf blade broadly orbicular or suborbicular, 1.2–2 × 1.4–2.5 cm; staminodes (3 or)4- or 5-lobed for 1/3–1/2 their length .................................................................  48. P. dilatata

16b. Basal leaf blade reniform, ovate-reniform, or ovate-cordate.

21a. Staminodes terete, entire, apex rounded or discoid.

22a. Basal leaf blade reniform, base deeply cordate; petals green.

23a. Stem 15–30 cm; petals lanceolate or oblanceolate, 10–20 × ca. 5 mm; basal leaf blade 3–6 × 5–9.5 cm .................................................................  1. P. longipetala

23b. Stem 5–11 cm; petals flabellate, 4–8 × 3–6 mm; basal leaf blade 5–25 × 13–30 mm .... 2. P. tenella

22b. Basal leaf blade ovate-cordate; basal leaf blade ovate-cordate or ovate-reniform.

24a. Petals green or yellow-green.

25a. Petals yellow-green; cauline leaf ovate-reniform; basal leaf blade ovate-reniform; staminodes indistinctly 3–6-dentate at apex ......................................................  5. P. longipetaloides

25b. Petals green; cauline leaf oblong or ovate-lanceolate; basal leaf blade ovate-cordate or ovate-reniform.

26a. Petals densely purple-brown punctate; staminodes rounded at apex; basal leaf blade usually ovate-cordate .................................................................  3. P. angustipetala

26b. Petals not punctate; staminodes truncate or emarginate at apex; basal leaf blade usually ovate-reniform .................................................................  4. P. yulongshenensis

24b. Petals white or yellowish.

27a. Petals distinctly purple-brown punctate, obovate-oblong, often emarginate at apex; staminodes often indistinctly 3-crenate at apex, or entire ......................................................  6. P. yunnanensis

27b. Petals indistinctly purple punctate, oblong or narrowly oblanceolate, acute or rounded at apex; staminodes rounded at apex.

28a. Basal leaf blade ovate-cordate, base cordate; cauline leaf borne near apex of stem, much smaller than basal leaves; petals yellowish ......................................................  7. P. yanyuanensis
28b. Basal leaf blade ovate-triangular, base not cordate; cauline leaf borne near base of stem, about as large as basal leaves; petals white .............................................................. 8. *P. humilis*

21b. Staminodes branched, or flat with apex dentate or lobed.

29a. Staminodes branched.

30a. Staminodes 7–23-branched ................................................................. 63. *P. palustris*

30b. Staminodes (3 or)5(or 7)–branched.

31a. Petal margin fimbriate proximally, entire or undulate distally.

32a. Staminodes divided almost to base ..................................................... 58. *P. gansuensis*

32b. Staminodes divided for ca. 1/2 their length ........................................... 59. *P. simaoensis*

31b. Petal margin fimbriate throughout; staminodes divided for 1/3–1/2 their length.

33a. Basal leaf blade ovate-cordate, thick textured, base cordate ...................... 61. *P. perciliata*

33b. Basal leaf blade reniform, thin textured, base subcordate or truncate ........... 62. *P. davidii*

29b. Staminodes flat, apex dentate or lobed.

34a. Staminodes (3–)5–7-dentate at apex.

35a. Cauline leaf borne near base of stem ................................................... 22. *P. qinghaiensis*

35b. Cauline leaf borne near middle of stem or distally.

36a. Petals broadly spatulate or obovate, base broadly and shortly clawed (claw ca. 1 mm), margin erose or subentire; basal leaf blade cuneate or subcordate at base .......... 13. *P. degeensis*

36b. Petals triangular-ovate, base long clawed (claw 2–2.5 mm), margin long fimbriate proximally; basal leaf blade deeply cordate at base ........................................ 14. *P. farreri*

34b. Staminodes 3- or 5-lobed at apex.

37a. Staminodes 5–lobed at apex.

38a. Petal margin sparsely and shortly fimbriate throughout; stem less than 10 cm . 52. *P. omeiensis*

38b. Petal margin long fimbriate proximally; stem more than 10 cm.

39a. Staminode lobes subequal.

40a. Basal leaf blade broadly cordate, about as long as wide, 2.5–4.5(–5) × 3.8–5.5 cm; petals shortly clawed ................................................................. 47. *P. wightiana*

40b. Basal leaf blade oblong-cordate, nearly 2 × as long as wide, to 7 cm; petals long clawed ................................................................. 49. *P. monochoriifolia*

39b. Staminode lobes unequal.

41a. Central 3 staminode lobes ca. 3 × as long as lateral ones; petals yellow-white; basal leaf blade reniform ........................................................................ 50. *P. yiliangensis*

41b. Staminode lobes subequal, central 3 parted, lateral ones very shallowly lobed; petals white; basal leaf blade ovate-cordate ........................................ 51. *P. chengkouensis*

37b. Staminodes 3-lobed at apex.

42a. Staminode lobes unequal.

43a. Central staminode lobe much shorter than lateral ones; petals greenish, narrowly oblong, margin sparsely and shortly fimbriate; cauline leaf borne distally on stem ...... 39. *P. cooperi*

43b. Central staminode lobe ca. 0.6 mm longer than lateral ones; petals white, obovate, rarely subspatulate, margin entire; cauline leaf borne near base of stem ...... 40. *P. laxmannii*

42b. Staminode lobes subequal.

44a. Petal margin long fimbriate proximally.

45a. Basal leaf blade ovate-cordate, larger, thick textured ................................. 19. *P. crassifolia*

45b. Basal leaf blade reniform, orbicular, or broadly ovate-orbicular, occasionally ovate-cordate, thin textured.

46a. Pets oblong glands near base, apex acute; basal leaf blade 1.2–2.4 × 1.2–2.4 cm, much larger than cauline leaf ...................................................... 17. *P. yui*

46b. Pets broadly obovate, eglandular, apex emarginate; basal leaf blade 6–11 × 7.5–14 mm, subequaling cauline leaf ...................................................... 18. *P. chinensis*

44b. Petal margin shorty fimbriate or erose proximally, or entire.

47a. Petal margin shortly fimbriate proximally.

48a. Sepals and petals purple-brown punctate; petals 5–6 × 3–4 mm; basal leaf blade 9–10 × 8–9 mm ................................................................. 21. *P. venusta*
48b. Sepals and petals not punctate; petals 7.8–9.5 × 5.2–6.1 mm; basal leaf blade 1–1.5 cm × 9–14 mm ......................................................... 20. *P. epunctulata*

47b. Petal margin erose or entire.

49a. Ovary superior.

50a. Basal leaf blade broadly elliptic, attenuate into petiole at base; petals yellow, spatulate or spatulate-oblancoate ........................................ 23. *P. filechneri*

50b. Basal leaf blade ovate-reniform or ovate-cordate, cordate at base; petals white or green, obovate or lanceolate.

51a. Petals green, minutely purple punctate, lanceolate, margin densely erose, apex acuminate ......................................................... 25. *P. lanceolata*

51b. Petals white, obovate, margin sparsely erose or entire, apex rounded or 2-lobed.

52a. Basal leaf blade ovate-reniform; stem to 4 cm ........................... 26. *P. kangdingensis*

52b. Basal leaf blade ovate-cordate; stem usually more than 4 cm.

53a. Petals 2-lobed or emarginate at apex; staminodes 3-lobed for ca. 1/3 their length ............................................................... 27. *P. mysorensis*

53b. Petals rounded at apex; staminodes shallowly 3(-6)-lobed for ca. 1/6 their length.

54a. Stem 7–10 cm; basal leaf blade densely brown punctate, ovate, with 5–7 arcuate veins, base cordate; staminode lobes rounded at apex, subequal 29. *P. cacuminum*

54b. Stem 16–27 cm; basal leaf blade not distinctly punctate, obovate-oblong, 7–9-veined, base deeply cordate; staminode lobes truncate at apex, central one narrower than lateral ones ......................... 28. *P. submysorensis*

49b. Ovary semi-inferior.

55a. Basal leaf blade ovate-cordate or reniform.

56a. Basal leaf blade ovate-cordate or reniform, longer than wide base cordate 31. *P. pusilla*

56b. Basal leaf blade ovate-cordate, about as long as wide, base deeply cordate.

57a. Stem 8–13 cm; basal leaf blade 5–15 × 7–15 mm, cordate or subcordate at base ................................................................. 27. *P. mysorensis*

57b. Stem 23–32 cm; basal leaf blade 3–4.1 × 3–4.1 cm, deeply cordate at base 30. *P. cordata*

55b. Basal leaf blade ovate-oblong.

58a. Stem (13–)17–40 cm; basal leaf blade ovate-oblong or ovate-triangular, truncate, subcordate, or sometimes decurrent at base.

59a. Staminode lamina 3-parted for (1/2–)2/3 its length ......................... 32. *P. oreophila*

59b. Staminode lamina 3-lobed for 1/5–1/4(–1/2) its length.

60a. Staminodes ca. 3.2 mm, lobes shortly linear; petals yellow ............. 33. *P. tibetana*

60b. Staminodes 4–5 mm, lobes lanceolate or ovate-lanceolate; petals white 34. *P. nubicola*

58b. Stem 6–21 cm; basal leaf blade ovate-cordate, not truncate at base.

61a. Petals obovate or broadly so.

62a. Petals purple punctate, broadly obovate; stem less than 6 cm; basal leaf petiole ca. 1 cm, leaf blade usually cordate at base ............... 35. *P. subscaposa*

62b. Petals not or indistinctly punctate, obovate; stem 8–21 cm, rarely shorter; basal leaf petiole (1.5–)3.5–6 cm, leaf blade usually truncate at base 36. *P. deqenensis*

61b. Petals lanceolate or oblong-lanceolate.

63a. Petals white; basal leaf petiole 8–15 mm, occasionally to 4 cm ...... 37. *P. trinervis*

63b. Petals green; basal leaf petiole (1–)5–25 mm ............................... 38. *P. viridiflora*

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长瓣梅花草  chang ban mei hua cao

Stems 1 or 2, 12–30 cm, often with 1 leaf near middle.
Basal leaves usually 1, rarely 2; petiole 4–11 cm; leaf blade abaxially greenish, adaxially deep green, reniform, 3–6 × 5–9.5 cm, inconspicuously arcuate veined abaxially, base deeply cordate, apex rounded. Cauline leaf sessile, reniform, 0.8–2 × 1.5–3.5 cm, base sometimes with a few rusty brown, hairlike appendages.

Flower 2.5–3.2 cm in diam.; hypanthium turbinate. Sepals semiorbicular or ovate, 4–6 × 2–4 mm, margin serrulate, apex obtuse. Petals green, lanceolate or narrowly oblong-lanceolate, (1–)1.5–2.5 cm × 4–5.5 mm, base cuneate into a claw 2–2.5 mm, margin densely serrulate or shortly fimbriate, apex acute. Anthers oblong, ca. 1.2 mm; filaments 5–6 mm; staminodes dark purple, terete, discoid, 3.5–4 mm, shorter...
than stamens, stalk ca. 2 × 1 mm, apex of lamina rounded, entire, occasionally indistinctly dentate. Ovary superior, depressed globose, with 3 or 4 slightly thickened angles; style ca. 1.5 mm; stigma 3-lobed, lobes spreading, obovate. Capsule depressed globose. Seeds brown, glossy, oblong. Fl. Jul, fr. Aug.

- *Tsuga* forests, forest margins, *Rhododendron* scrub, alpine meadows; 2400–3900 m. SE Xizang, NW Yunnan.

   - Stem 15–30 cm. Basal leaf blade 3–6 × 5–9.5 cm.
   - *Tsuga* forests, forest margins, alpine meadows; 2400–3900 m. SE Xizang, NW Yunnan.

   - Stem 12 cm. Basal leaf blade relatively small. Petals to 1 cm.
   - Forest margins, alpine meadows; ca. 2900 m. SW Sichuan (Muli Zang Zu Zizhixian).

In habit, this species resembles the two varieties of *Parnassia yunnanensis*. However, *P. yunnanensis* differs in having white, obovate petals; var. *longistipitata* differs in having longer-stalked staminodes; and var. *yunnanensis* differs in having apically inconspicuously 3-dentate staminodes.

   - Forest margins, alpine meadows; ca. 2000 m. SW Sichuan (Muli Zang Zu Zizhixian).

In habit, this species resembles the two varieties of *Parnassia yunnanensis*. However, *P. yunnanensis* differs in having white, obovate petals; var. *longistipitata* differs in having longer-stalked staminodes; and var. *yunnanensis* differs in having apically inconspicuously 3-dentate staminodes.

   - Alpine meadows; 4100–5300 m. NW Yunnan (Lijiang Naxi Zu Zizhixian).
reniform, 4.5–6.5 × 4.1–7 mm, 3-veined abaxially, base
cordate, apex obtuse. Cauline leaf sessile, amplexicaul,
cordate-reniform, 4–6 × 4–5 mm, base sometimes with
a few rusty brown appendages. Flower 3.5–5.5 mm in
diam.; hypanthium campanulate. Sepals erect at
anthesis, ovate-elliptic, 2.5–3 × 1.9–2 mm, 3-veined,
base with several rusty brown appendages, margin
entire, apex obtuse. Petals yellow-green or brown-green,
oblung or lanceolate, 3.2–4.1 × 1.5–2 mm, base
abruptly contracted into a claw ca. 1 mm, sometimes
with several rusty brown, hairlike appendages, margin
indistinctly erose proximally, apex acute. Anthers
ellipsoid, ca. 0.8 mm; filaments ca. 3 mm; staminodes
terete, ca. 1.5 mm, stalk ca. 0.5 × 0.6 mm, lamina
apicly disoid, disc 0.8 mm in diam., rim indistinctly
4–6-dentate. Ovary mostly superior; style ca. 0.5 mm;
• Alpine meadows; 3600–4200 m. NW Yunnan (Eryuan Xian,
Lijiang Naxi Zu Zizhixian).

6a. Parnassia yunnanensis var. yunnanensis

云南梅花草 yun nan mei hua cao

Plants cespitose. Stems 1–3, 4–8 cm, with 1 leaf distally
or near apex. Basal leaves 3–5, forming a rosette;
petiole 0.5–2 cm; leaf blade abaxially greenish,
glaucous, and densely purple-brown punctate, adaxially
deep green, broadly ovate, 6–11 × 6–11 cm, base
deeperly cordate, apex obtuse. Cauline leaf sessile,
semiamplexicaul, ovate or semioblong, 2–3 mm, base
sometimes with a few rusty brown appendages. Flower
0.7–1.4 cm in diam.; hypanthium hemispheric. Sepals
oblung or semioblong, ca. 4 × 2 mm, margin
sometimes shallowly erose, apex rounded. Petals white
or whitish green, densely purple-brown punctate or not,
oblung-oblong, ca. 7 mm, margin densely erose or
shortly fimbriate, apex emarginate. Anthers oblong,
0.5–1 mm; filaments 3–4 mm; staminodes terete, 1–1.5
mm, stalk 0.7–1 mm, lamina apically disoid, disc ca.
1.2 mm in diam., rim undulate. Ovary superior, globose;
fr. Sep.
• Forests, marshy meadows, grassy slopes; 3300–4300
m. W Sichuan, NW Yunnan.

6b. Parnassia yunnanensis var. longistipitata Z. P. Jien,


云南梅花草 chang bing yun nan mei hua cao

Petals whitish green, densely purple-brown punctate.
Staminodes ca. 1 mm, stalk ca. 0.7 mm.
• Forests, grassy slopes, streamside; 3500–4000 m. NW Yunnan.

6b. Parnassia yunnanensis var. longistipitata Z. P. Jien,


云南梅花草 chang bing yun nan mei hua cao

Petals whitish green, not punctate. Staminodes ca. 1.5 mm,
stalk ca. 1 mm.
• Marshy meadows, grassy places; 3300–4300 m. Sichuan
(Kangding Xian, Qianning).

7. Parnassia yanyuanensis


云南梅花草 yan yuan mei hua cao

Stems 1(or 2), 3–4 cm, with 1 leaf distally or near apex.
Basal leaves 4–7; petiole 1.5–2.8 cm; leaf blade
abaxially greenish, adaxially deep green, ovate-cordate,
6–11 × 6–9 mm, inconspicuously 3-veined abaxially at
base, base cordate, apex obtuse. Cauline leaf very
shortly petiolate; leaf blade ovate-lanceolate, ca. 7 × 4
mm, base truncate or subcordate, often with several
rusty brown appendages. Flower ca. 1 cm in diam.;
hypanthium shortly campanulate. Sepals long elliptic,
2.5–2.8 × ca. 2 mm, base often with 2 or 3 rusty brown
appendages, margin entire, apex obtuse. Petals
yellowish, inconspicuously purple punctate, obovate-
oblung, 4–4.8 × ca. 2 mm, base attenuate into a claw ca.
1 × 0.8 mm, margin entire or indistinctly erose, apex
rounded. Anthers oblong, ca. 0.8 mm; filaments 3–4
mm; staminodes terete, discoid, ca. 1.1 × 0.2 mm,
shorter than stamens, stalk ca. 0.2 × 0.8 mm, lamina ca.
0.7 × 0.2 mm, apex rounded. Ovary superior, ovoid;
• Rock fissures on mountain slopes; ca. 4000 m. SW Sichuan
(Yanyuan Xian).

In habit, this species resembles both Parnassia angustipetala and P.
yulongshanensis. However, the former species differs in having sepal
oblung or ovate-lanceolate, and petals green, densely purple-brown
punctate, spathulate or ovate-lanceolate. The latter species differs in
having green petals and apically truncate or emarginate staminodes.

8. Parnassia humilis


矮小梅花草 ai xiao mei hua cao

Stems 1–3, 3–5 cm, with 1 leaf near base. Basal leaves
7–9, forming a rosette; petiole ca. 0.5 × 1 cm; leaf blade
abaxially greenish, adaxially deep green, ovate-
triangular, 0.8–1.4 cm × 6–9 mm, conspicuously brown
3–5-veined abaxially, base attenuate, apex acuminate.
Cauline leaf similar to basal ones but often smaller, base
sometimes with a few caducous, rusty brown
appendages. Flower ca. 1 cm in diam.; hypanthium
shortly campanulate. Sepals oblong-lanceolate, 2.5–4.8 ×
ca. 2 mm, base with 3 or 4 rusty brown
appendages. Flower ca. 1 cm in diam.;
hypanthium shortly campanulate. Sepals oblong,
2.5–3.8 × ca. 2 mm, base often with 2 or 3 rusty brown
appendages, margin entire, apex obtuse. Petals
yellowish, inconspicuously purple punctate, obovate-
oblong, 4–4.8 × ca. 2 mm, base attenuate into a claw ca.
1 × 0.8 mm, margin entire or indistinctly erose, apex
rounded. Anthers oblong, ca. 0.8 mm; filaments 3–4
mm; staminodes terete, discoid, ca. 1.1 × 0.2 mm,
shorter than stamens, stalk ca. 0.2 × 0.8 mm, lamina ca.
0.7 × 0.2 mm, apex rounded. Ovary superior, ovoid;
• Forests, marshy meadows, grassy slopes, streamside; 3300–4300
m. W Sichuan, NW Yunnan.

Inhabit, this species resembles both Parnassia angustipetala and P.
yulongshanensis. However, the former species differs in having sepal
oblung or ovate-lanceolate, and petals green, densely purple-brown
punctate, spatulate or ovate-lanceolate. The latter species differs in
having green petals and apically truncate or emarginate staminodes.

Stems 3–12, slender, to 6 cm, with 1 leaf near apex. Basal leaves 12–25, forming a rosette; petiole 1–2 cm; leaf blade orbicular- or obovate-spatulate or spatulate, 0.7–1.5 cm × 5–9 mm, base attenuate, apex rounded. Cauline leaf subulate, apiculate. Petals white, broadly elliptic, veined, margin entire. Anthers white, subglobose; staminodes brown, ca. 1/2 as long as stamens, margin entire. Ovary conical.

11. Parnassia faberi Oliver, Hooker’s Icon. Pl. 18: t. 1778. 1888.

Stems 2 or 3, short or occasionally branched and elongate, 5–8 cm, with 1 leaf near middle. Basal leaves numerous; petiole 5–8 mm; leaf blade abaxially 

• Riverside meadows; ca. 5000 m. EC Xizang (Amdo Xian).

In habit, this species resembles both Parnassia angustipetala and P. yunnanensis. However, the former species differs in having basal leaf blades usually ovate-cordate, with a cordate, sometimes truncate base, and petals green, densely purple-brown punctate, spatulate or obovate-lanceolate. The latter species differs in having basal leaf blades broadly ovate, with a deeply cordate base, and petals white or whitish green, often densely purple-brown punctate, obovate-oblong.


Guizhou (Longchang).

7 mm, 5(–7)-veined abaxially, base cuneate or subcordate, apex rounded. Cauline leaf sessile, semilamplexicaul, ovate, ca. 2 mm, base sometimes with a few rusty brown appendages. Flower 6–8 mm in diam.; hypanthium shortly turbinate. Sepals oblong, ca. 4 × 2.5 mm, margin entire, apex rounded. Petals green, densely purple-brown punctate, broadly spatulate or obovate, 7–8 × 3.5–4 mm, brownish 5–7-veined with veins confluent apically, base attenuate into a claw ca. 1 mm, margin erose or subentire, apex rounded. Anthers oblong, ca. 0.8 mm; filaments ca. 8 mm; staminodes flat, ca. 2.8 mm, stalk ca. 1.2 mm, lamina undulate or 5–7-dentate at apex. Ovary ovoid; style 0.8–1 mm; stigma 3-lobed, lobes spreading, semiobovate. Capsule unknown. Fl. Aug.

• Rock fissures. NW Sichuan (Dêgê Xian).


长爪梅花草 chang zhao mei hua cao

Stems 1 or 2, slender, 4–10 cm, with 1 leaf near middle or distally. Basal leaves 2 or 3(–5); petiole slender, 1–3 cm; leaf blade abaxially greenish, densely brown punctate, adaxially deep green, orbicular, rarely reniform, 2–9(–14) × 2–9(–14) mm, base deeply cordate, apex rounded, rarely obtuse. Cauline leaf sessile or subsessile, purple-brown punctate, ovate-triangular or ovate, ca. 4 × 3.5 mm, base not cordate, often with a few rusty brown appendages, apex acute. Flower 8–11 mm in diam.; hypanthium turbinate. Sepals purple-brown punctate, ovate or oblong, ca. 2.5 × 1.8 mm, margin entire, apex obtuse or acute. Petals white, densely purple-brown punctate, triangular-ovate, 4.5–6 × ca. 2 mm, base abruptly contracted into a claw 2–2.5 × ca. 0.5 mm, margin long fimbriate proximally, entire or undulate distally, apex rounded-obtuse. Anthers ellipsoid, 0.5–1 mm; filaments 2–2.5 mm; staminodes broadly spatulate, flat, ca. 0.8 × 1.2 mm, stalk ca. 0.5 × 1.2 mm, margin dentate or undulate distally, apex rounded. Ovary superior, broadly ovoid; style ca. 0.8 mm; stigma 3-lobed, lobes oblong, round. Capsule depressed ovoid. Seeds brown, glossy, oblong. Fl. Aug.–Sep. Fl. Oct.

Forests, valleys, rock fissures; 3000–3400 m. NW Yunnan (Gongshan Drung-Nu Zu Zizhixian) [Myanmar].


黄花梅花草 huang hua mei hua cao

Stems 1–3(–7), 13–20 cm, leafless. Basal leaves 2–4; petiole 1.2–2.5(–4) cm, with 3 brownish striations; leaf blade ovate or oblong-ovate, 0.8–1.3(–2.5) cm × 5–9(–15) mm, 3 (–5)-veined with veins prominent abaxially and impressed adaxially, base attenuate or subcordate, apex rounded. Flower 1.8–2.3 cm in diam.; hypanthium shortly turbinate. Sepals lanceolate, ca. 7 × 2–5 mm, 3(–5)-veined, margin entire, apex obtuse or subacute. Petals deep yellow, obovate, 1.2–1.4 cm × 5–8 mm, base contracted into a claw ca. 4 × 1.5 mm, curved 5-veined with veins branched, margin entire, apex rounded and cleft. Anthers oblong, ca. 1.5 mm; filaments ca. 4 mm; staminodes flat, ca. 3.5 mm, 3-lobed at apex, lobes linear, ca. 1.2 mm, rounded and slightly thickened at apex. Ovary semi-inferior, long ovoid; style very short; stigma 3-lobed, lobes spreading, oblong, nearly equaling style. Capsule ovoid, 3-valved. Seeds brown, glossy, oblong. Fl. Jul.–Aug., fr. Aug.

• Scrub, alpine meadows, under rocks; 3500–4100 m. NE Qinghai.


白花梅花草 bai hua mei hua cao

Parnassia aphylla T. C. Ku.

Stem usually 1, 10–20 cm, leafless. Basal leaves 4 or 5; petiole 5–14(–23) cm; leaf blade elliptic or obovate, 1.2–2.5 × 0.8–1.3 cm, 3- or 5-veined with veins prominent abaxially and impressed adaxially, base attenuate, apex rounded. Flower 1.8–2.5 cm in diam.; hypanthium shortly turbinate. Sepals obovate-lanceolate, ca. 8 × 2.5 mm, distinctly 3-veined, margin entire, apex obtuse. Petals white or white-yellow, obovate, ca. 1.4 cm × 7–8 mm, base cuneate into a claw ca. 2.5 × 2 mm, apex rounded or emarginate. Anthers ellipsoid, ca. 1.5 mm; filaments ca. 4 mm; staminodes flat, ca. 3.5 mm, stalk ca. 2.8 × 1 mm, lamina divided for 1/5–1/3 its length into 3 lobes, central lobe linear, ca. 0.6 mm, longer than lateral ones, apex truncate, slightly thickened. Ovary semi-inferior, ovoid; style short; stigma 3-lobed. Capsule unknown. Fl. Aug.

• Scrub, alpine meadows; 3700–4500 m. S Qinghai, W Sichuan, S Xizang (Gongbo’gyamda Xian).


俞氏梅花草 yu shi mei hua cao

Stems 1 or 2(–4), 6–14 cm, usually with 1 leaf near middle. Basal leaves usually 2; petiole slender, 1.5–3 cm; leaf blade abaxially greenish, adaxially deep green, orbicular or broadly ovate-ovorbicular, 1.2–2.4 × 1.2–2.4 cm, arcuate 7-veined, base deeply cordate, apex rounded-obtuse, distinctly apiculate. Cauline leaf sessile or subsessile, ovate or triangular, very small, 1–4 mm, base truncate or broadly cuneate, often with several rusty brown appendages ca. 1 mm. Flower 0.8–1.3 cm in diam.; hypanthium shortly turbinate. Sepals brown punctate on both surfaces, oblong-lanceolate, ca. 3 × 1.2 mm, 3-veined, margin entire, apex subobtuse, acute, acuminate. Petals white, purple-brown punctate on both surfaces, oblanceolate, 4.5–6 × 1.8–2.5 mm, 1- or 3-veined, base attenuate into a claw 1–1.5 mm, with 2 green, oblong glands, margin fimbriate proximally, apex acute to acuminate. Anthers oblong, 0.5–1 mm; filaments ca. 3 mm; staminodes flat, ca. 2 × 2.4 mm, 3-lobed, central lobe narrower than lateral ones. Ovary ovoid, proximally sunken into hypanthium for ca. 1/4 its length; style 1–1.2 mm; stigma 3-lobed, lobes

Beneath bamboo; ca. 3000 m. NW Yunnan (Gongshan Drung-Nu Zu Zizhixian).


中国梅花草 zhong guo mei hua cao
Stems 1–4, 8–16 cm, with 1 leaf near middle. Basal leaves usually 3–8; petiole 1.5–3.5(–5) cm; leaf blade abaxially gray-green, purple punctate, adaxially brown-green, usually reniform or ovate-reniform, occasionally ovate-cordate, 0.6–1.1 × 0.75–1.4 cm, distinctly 3–5-veined abaxially, base deeply cordate, apex rounded, sometimes obtuse or emarginate. Cauline leaf sessile, semiamplexicaul, abaxially densely purple-brown punctate, ovate-cordate, 4–9 × 4–8 mm, base often with several rusty brown appendages. Flower 1–1.4 cm in diam.; hypanthium turbinate. Sepals densely purple punctate, ovate or oblong, 3–5 × 2.5–3.5 mm, margin subentire, apex acute. Petals white, brown punctate, broadly obovate, 1–1.15 cm × ca. 6 mm, base attenuate into a claw 1.2–2 mm, margin densely long fimbriate or lacerate-fimbriate proximally, entire, undulate, or irregularly crenate distally, apex emarginate. Anthers oblong, ca. 0.8 mm; filaments 4–6 mm; staminodes broadly spatulate, flat, ca. 2.5 mm, stalk ca. 1.5 × 1.2 mm, lamina ca. 1 × 1.8 mm, 3-lobed at apex. Ovary depressed globose, apex abruptly contracted into style; style ca. 1.2 mm; stigma 3-lobed. Capsule unknown. Fl. Jul.–Aug.

Scrub, alpine meadows, slopes; 3600–4200 m. C Sichuan, SE Xizang, NW Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].

18a. Basal leaf blade reniform, occasionally ovate-cordate; petal margin long fimbriate proximally, basal claw 1.5–2 mm 18a. var. chinensis

18b. Basal leaf blade ovate-reniform; petal margin lacerate-fimbriate proximally, basal claw ca. 1.2 mm ......... 18b. var. sechuanensis

18a. Parnassia chinensis var. chinensis

中国梅花草(原变种) zhong guo mei hua cao (yu bian zhong)
Basal leaf blade reniform, occasionally ovate-cordate. Petal margin long fimbriate proximally, basal claw 1.5–2 mm.

Scrub, alpine meadows, slopes; 3600–4200 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].


四川梅花草 si chuan mei hua cao
Basal leaf blade ovate-reniform. Petal margin lacerate-fimbriate proximally, basal claw ca. 1.2 mm.

C Sichuan (Baoxing Xian, Emei Shan).


鸡心梅花草 ji xin mei hua cao
Stem l(or 2), 17–55 cm, with 1 leaf near middle. Basal leaves 2–4(–or 5); petiole (4–)7–12 cm; leaf blade abaxially greenish, densely brown punctate, adaxially deep greenish, ovate-cordate, 2–4.5 × ca. 3.5 cm, leathery, midvein conspicuous, base cordate or subcordate, apex acute or acuminate. Cauline leaf sessile, semiamplexicaul, densely purple-brown punctate, ovate-cordate, 1.3–2.1 cm, base cordate, often with several rusty brown appendages. Flower 1.5–2.5 cm in diam.; hypanthium turbinate. Sepals densely purple-brown punctate, broadly ovate, 5–6 × 2–4 mm, margin entire or erose proximally, apex obtuse or acute. Petals white, densely purple-brown punctate, broadly spatulate, 1–2 × 6–8 mm, 3-veined, base with a claw 3–3.5 mm, margin entire or long fimbriate proximally, erose distally, apex rounded. Anthers ellipsoid, ca. 1.8 mm; filaments ca. 8 mm; staminodes flat, ca. 5 mm, 3-lobed to middle, lobes linear, ca. 3 mm, apex rounded. Ovary densely purple-brown punctate, ovoid; style short; stigma 3-lobed. Capsule ovoid, with 3 thickened, longitudinal angles. Seeds brown, glossy, oblong. Fl. Jul.–Aug, fr. Sep.

• Streamsides, moist places in valleys; 2500–3300 m. W Sichuan, N Yunnan.

In habit, this species resembles Parnassia wightiana, which differs in having thinner, subtriangular-ovate, ovate-cordate, broadly cordate, or reniform basal leaf blades and 5-lobed staminodes.


无斑梅花草 wu ban mei hua cao
Stems 1–3(–5), 9–13 cm, with 1 leaf proximally. Basal leaves 3–5(–8); petiole 1.5–3.2 cm; leaf blade abaxially greenish, adaxially deep green, cordate, rarely ovate-cordate, 1.5 × 0.9–1.4 cm, midvein conspicuous, base deeply cordate, apex rounded or subobtuse. Cauline leaf sessile, semiamplexicaul, ovate-cordate, 6–11 × 6–7 mm, base with a few rusty brown appendages. Flower 1.5–1.9 cm in diam.; hypanthium shallow. Sepals erect at anthesis, oblong, 3–4 × 1.5–2 mm, 3-veined with veins confluent apically, base with a few rusty brown appendages, margin entire, apex subobtuse. Petals white, spatulate-ovate, 7.8–9.5 × 5.2–5.4 mm, base attenuate into a claw ca. 1.7 mm, margin shortly fimbriate proximally, undulate or dentate distally, apex rounded or emarginate. Anthers oblong, 0.8–1.2 mm; filaments ca. 3 mm; staminodes spatulate, flat, 3-lobed to middle, lobes sometimes unequal, stalk ca. 1.5 × 1 mm. Ovary ovoid; style ca. 0.8 mm; stigma 3-lobed. Capsule unknown. Fl. Jul.

• Alpine meadows; 3400–3800 m. NW Yunnan.

In habit, this species resembles Parnassia mysorensis, which differs in having petals with margin entire, erose, or serrate proximally and apex emarginate or 2-cleft, and staminodes with subequal lobes.


娇媚梅花草 jiao mei mei hua cao
Stem usually 1, 3–8 cm, with 1 leaf near middle or distally. Basal leaves 3–5(–8); petiole slender, 1.5–3.5
cm; leaf blade abaxially greenish, adaxially deep green, reniform, 9–10 × 8–9 mm, arcuate 3–5 veined, base deeply cordate, apex rounded-obtuse, apiculate. Cauline leaf sessile, semiamplexicaul, ovate-cordate or ovata-trianguler, ca. 3 mm, base often with a few caducous, rusty brown appendages. Flower 6–10 mm in diam.; hypanthium shortly turbinate. Sepals spreading, brown punctate, ovate-oblong or oblollng, 3–4 × 1.5–2 mm, 1-veined, base attenuate, apex obtuse. Petals white, brown punctate, obovate-lanceolate, 5–6 × 3–4 mm, base contracted into a claw 1–1.2 mm, margin shortly fimbriate proximally, entire or erose distally, apex rounded-obtuse, sometimes emarginate or indistinctly crenate. Anthers ellipsoid, ca. 0.8 mm; filaments ca. 2 mm; staminodes broadly spatulate, 2–2.2 × 0.9 mm, stalk ca. 1.2 mm, margin densely and acutely serrulate, apex obtuse. Stigma 3-lobed. Capsule opening when ripe to expose seeds in an ovate-cordate reniform, 9–10 × 8–9 mm, arcuate 3–5 veined, base attenuate, apex obtuse. Petals yellow, spatulate or spatulate-lanceolate, 5–6 × 2.5 mm, apex obtuse. Anthers ellipsoid, ca. 0.5 mm; filaments filiform; staminodes broadly spatulate, ca. 2.5 mm, 3-lobed at apex, lobes short, truncate at apex.

Stems 2–8, 6–15 cm, with 1 leaf near base. Basal leaves 8 or 9; petiole 8–10 mm, base broadened into a membranaceous sheath, brown margin ciliate; leaf blade brown punctate, cordate-reniform, 4–6 × 5–8 mm, leathery, glabrous, base cordate, apex obtuse. Cauline leaf petiolate; petiole to 1 mm, margin brown ciliate; leaf blade subcordate, 3.3–3.5 mm, glabrous. Hypanthium ca. 2 mm. Sepals brown punctate, sub-ovate, 3–3.3 × 2–2.5 mm, 5- or 6-veined with veins apically confluent, glabrous on both surfaces, apex obtuse. Petals pale yellow-green, obovate, 4.3–5 × 3–3.5 mm, base truncate to auriculate, with a claw adnate to hypanthium and staminodes, margin erose, apex retuse. Stamens to 4.3 mm; filaments subulate, base adnate to hypanthium; staminodes subspatulate, 2–2.2 × 0.8–1 mm, apex 3–5-dentate. Ovary semi-inferior, ovoid, ca. 2.5 mm; style to 1.5 mm; stigma 3-lobed. Capsule opening when ripe to expose seeds in an apparent splash cup.

Stems ca. 4 cm, with 1 leaf near base. Basal leaves long petiolate; petiole ca. 1 cm; leaf blade oblong, 8–9 × 4–5 mm, 3-veined, base attenuate. Cauline leaf sub.sessile, amplexicaul, ca. 1 cm. Flower ca. 7 mm in diam.; hypanthium turbinate, ca. 3 mm. Sepals ca. 3.5 mm, narrowly ovate, apex obtuse. Petals yellow, spatulate or spatulate-lanceolate, 5–6 × 2.5 mm, apex obtuse. Anthers ellipsoid, ca. 0.5 mm; filaments filiform; staminodes broadly spatulate, ca. 2.5 mm, 3-lobed at apex, lobes short, truncate at apex.

The present authors have seen no specimens of this species; the above description is based on the protologue.

Stems 2–8, 6–15 cm, with 1 leaf proximally or near middle. Basal leaves 4 or 5(–11); petiole 1.5–8.5 cm; leaf blade abaxially greenish, brown punctate, adaxially deep green, elliptic, rarely obovate-elliptic, 1.8–7 × 1–2.5 cm, 5-veined basally, midvein prominent, base rounded or cuneate, apex acute, obtusely apiculate. Cauline leaf ovate or ovate-triangular, 1–1.8 × 0.5–1.1 cm, base rounded or cuneate, with several rusty brown appendages. Flower 1.5–2 cm in diam.; hypanthium shortly turbinate. Sepals elliptic or ovate, rarely obovate, 4–5 × 2.5–3.5 mm, 5-veined, margin entire, apex rounded. Petals spreading, white, elliptic, 9–10 × 7–8 mm, 5-veined basally, base attenuate into a claw ca. 2 mm, margin entire, apex rounded. Anthers ellipsoid, ca. 1 mm; filaments ca. 5 mm; staminodes flat, 3–3.5 mm, stalk ca. 1.8 × 0.5 mm, lamina ca. 1.5 mm wide, 3-lobed, lobes lanceolate. Ovary superior, ovoid; style ca. 1.5 mm; stigma 3-lobed, lobes oblong. Capsule unknown. Fl. Jul.–Aug.

Stems 1, 3–7 cm, with 1 leaf near middle. Basal leaves 3–5; petiole 1.5–3.5 cm; leaf blade abaxially greenish, purple punctate, adaxially deep green, ovate-reniform or ovate-cordate, 4–14 × 5–12 mm, base cordate, apex acuminate. Cauline leaf petiolate, semiamplexicaul, similar to basal leaves but smaller, base often with a few rusty brown appendages. Flower 5–6 cm in diam.; hypanthium shortly turbinate. Sepals purple punctate on both surfaces, lanceolate, 2–2.5 × 0.8–1 mm, margin entire, apex obtuse. Petals green, densely purple-brown, ovate-reniform or ovate-cordate, 4–14 × 5–12 mm, base cordate, apex acuminate. Cauline leaf sessile, semiamplexicaul, ca. 1 cm. Flower ca. 7 mm in diam.; hypanthium turbinate, ca. 3 mm. Sepals ca. 3.5 mm, narrowly ovate, apex obtuse. Petals yellow, spatulate or spatulate-lanceolate, 5–6 × 2.5 mm, apex obtuse. Anthers ellipsoid, ca. 0.5 mm; filaments filiform; staminodes broadly spatulate, ca. 2.5 mm, 3-lobed at apex, lobes short, truncate at apex.

The present authors have seen no specimens of this species; the above description is based on the protologue.

In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*

25a. *Parnassia lanceolata* var. *lanceolata*


27a. *Parnassia mysorensis* var. *mysorensis*


In habit, this species resembles *Parnassia angustipetala*, which differs in having terete, discoid staminodes rounded and entire at the apex.

1a. Petals lanceolate, apex acuminate  25a. var. *lanceolata*
1b. Petals oblong, apex obtuse  25b. var. *oblongipetala*
• Among shrubs in forests, shaded slopes; 3400–3600 m. NW Yunnan (Zhongdian Xian).


高山梅花草 gao shan mei hua cao
Parnassia cacuminum f. yushuensis T. C. Ku.

Stem 1, (4–)7–10 cm, with 1 leaf near apex. Basal leaves numerous, usually 5–7; petiole 1.5–3 cm; leaf blade abaxially greenish, densely brown punctate, adaxially deep green or brown-green, ovate or ovate-cordate, 1–1.5 cm × 8–11 mm, arcuate (5–)7-veined, base cordate, apex rounded. Cauline leaf sessile, semiamplexicaul, ovate–, 5–8 mm, often with several rusty brown appendages at base. Flower 1.1–1.5 cm in diam.; hypanthium shallowly campanulate. Sepals densely purple-brown or indistinctly punctate on both surfaces, broadly oblong or ovate, 5–6 × ca. 3.5 mm, margin entire, apex rounded. Petals white, yellow-green, or whitish green, densely purple-brown punctate or indistinctly punctate on both surfaces, spatulate, 8–9 × 3–4 mm, base cuneate into a short claw ca. 1 mm, margin erose, apex rounded. Anthers oblong, 0.5–1 mm; filaments ca. 4.5 mm; staminodes green, flat, 3-lobed, central lobe slightly longer than lateral ones, lateral lobes truncate at apex. Ovary superior, long ovoid, apex abruptly contracted into a short style; stigma 3-lobed. Capsule unknown. Fl. Jun–Jul.

• Moist grassy places in or at margins of scrub, shaded moist places near streams; 3400–4300 m. S Qinghai (Yushu Xian), W Sichuan.


心叶梅花草 xin ye mei hua cao
Parnassia cucumin var. yushuensis T. C. Ku.

Stem 1, (4–)7–10 cm, with 1 leaf near apex. Basal leaves numerous, usually 5–7; petiole 1.5–3 cm; leaf blade abaxially greenish, densely brown punctate, adaxially deep green or brown-green, ovate or ovate-cordate, 1–1.5 cm × 8–11 mm, arcuate (5–)7-veined, base cordate, apex rounded. Cauline leaf sessile, semiamplexicaul, ovate–, 5–8 mm, often with several rusty brown appendages at base. Flower 1.1–1.5 cm in diam.; hypanthium shallowly campanulate. Sepals densely purple-brown or indistinctly punctate on both surfaces, broadly oblong or ovate, 5–6 × ca. 3.5 mm, margin entire, apex rounded. Petals white, yellow-green, or whitish green, densely purple-brown punctate or indistinctly punctate on both surfaces, spatulate, 8–9 × 3–4 mm, base cuneate into a short claw ca. 1 mm, margin erose, apex rounded. Anthers oblong, 0.5–1 mm; filaments ca. 4.5 mm; staminodes green, flat, 3-lobed, central lobe slightly longer than lateral ones, lateral lobes truncate at apex. Ovary superior, long ovoid, apex abruptly contracted into a short style; stigma 3-lobed. Capsule unknown. Fl. Jun–Jul.

• Moist grassy places in or at margins of scrub, shaded moist places near streams; 3400–4300 m. S Qinghai (Yushu Xian), W Sichuan.


类三脉梅花草 lei san mai mei hua cao

Stem usually 1, 4–10 cm, with 1 leaf near middle or distally. Basal leaves 2–4; petiole 7–9 cm; leaf blade abaxially purple-brown punctate, reniform or ovate-cordate, 4–7 × 3–5 mm, (3–)5-veined abaxially, base cordate, margin entire, apex rounded-obtuse. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base sometimes with a few rusty brown appendages. Flower 6–8 mm in diam.; hypanthium turbinate. Sepals oblong, ca. 1.5 × 1.2 mm, midvein conspicuous, base often with 1 or 2 rusty brown appendages, apex rounded. Petals white, brownish punctate on both surfaces, obovate, 5–6 (–8) × ca. 3.5 mm, midvein conspicuous, base cuneate into a claw ca. 0.1 mm, margin sparsely and shortly fimbriate proximally, erose or undulate distally, apex rounded. Anthers subglobose, ca. 0.3 mm; filaments ca. 1.7 mm; staminodes flat, ca. 1.5 mm, shortly stalked, 3-lobed at apex, lobes lanceolate. 0.3–0.4 mm, central one somewhat narrower than lateral ones. Ovary semi-inferior, ovoid; style short; stigma 3-lobed. Capsule unknown. Fl. Jul–Aug.

S Xizang [Bhutan, N India, Nepal, Sikkim]. The original material of Parnassia affinis is heterogeneous, also including plants identifiable as P. mysorensis var. mysorensis.


细叉梅花草 xi cha mei hua cao
Parnassia setchnenensis Franchet.

Stems (1 or)2–9 or more, 17–30 cm, with 1 leaf proximally or near middle. Basal leaves 2–8; petiole 2–5 (–10) cm; leaf blade ovate-oblong or triangular-ovate, 2.3–5 × 1–1.8 cm, conspicuously 3–5-veined with veins prominent abaxially, base often truncate or subcordate, sometimes attenuate, apex rounded, sometimes apiculate. Cauline leaf sessile, semiamplexicaul, cordate, 2–3 cm, base with several rusty brown appendages. Flower 2–2.5 cm in diam.; hypanthium campanulate. Sepals oblong, ca. 6 × 4 mm, conspicuously arcuate 7-veined, margin entire, apex obtuse. Petals white, purple-veined, densely punctate, obovate-oblong, 1.3–1.5 cm × 8–10 mm, base cuneate, margin shortly fimbriate or erose in proximal 1/3, entire in distal 2/3, apex rounded. Anthers oblong, 0.8–1.4 mm; filaments ca. 7 mm; staminodes flat, ca. 3 mm, stalk ca. 1.5 × 1.3 mm, lamina 3-lobed to middle, lobes lanceolate. Ovary semi-inferior, ovoid; style ca. 2 mm; stigma 3-lobed, lobes oblong. Capsule depressed globose, ca. 1 cm in diam. Seeds brown, glossy. Fl. Jul–Aug, fr. Sep.

Alpine meadows; 3200–4100 m. NW Yunnan (Bijiang Xian) [India]. Parnassia cordata was originally described by Drude (loc. cit.) as a variety of P. nubicola. However, the present authors treat P. cordata as a distinct species because it strongly differs from P. nubicola in having slender stems and ovate-cordate basal leaf blades with a deeply cordate base.


类三脉梅花草 lei san mai mei hua cao

Stem usually 1, 4–10 cm, with 1 leaf near middle or distally. Basal leaves 2–4; petiole 7–9 cm; leaf blade abaxially purple-brown punctate, reniform or ovate-cordate, 4–7 × 3–5 mm, (3–)5-veined abaxially, base cordate, margin entire, apex rounded-obtuse. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base sometimes with a few rusty brown appendages. Flower 6–8 mm in diam.; hypanthium turbinate. Sepals oblong, ca. 1.5 × 1.2 mm, midvein conspicuous, base often with 1 or 2 rusty brown appendages, apex rounded. Petals white, brownish punctate on both surfaces, obovate, 5–6 (–8) × ca. 3.5 mm, midvein conspicuous, base cuneate into a claw ca. 0.1 mm, margin sparsely and shortly fimbriate proximally, erose or undulate distally, apex rounded. Anthers subglobose, ca. 0.3 mm; filaments ca. 1.7 mm; staminodes flat, ca. 1.5 mm, shortly stalked, 3-lobed at apex, lobes lanceolate. 0.3–0.4 mm, central one somewhat narrower than lateral ones. Ovary semi-inferior, ovoid; style short; stigma 3-lobed. Capsule unknown. Fl. Jul–Aug.

S Xizang [Bhutan, N India, Nepal, Sikkim]. The original material of Parnassia affinis is heterogeneous, also including plants identifiable as P. mysorensis var. mysorensis.

- Alpine meadows at forest margins, moist slopes, roadsides; 1600–3000 m. Gansu, Hebei, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.


西藏梅花草 xi zang mei hua cao
Stems 1 or 2, ca. 12 cm, with 1 leaf proximally. Basal leaves usually 2 or 3(or 4); petiole ca. 1.5 cm; leaf blade abaxially greenish, adaxially brown-green, ovate-oblong, 1.5–2.3 × 1–1.4 cm, base truncate or broadly cuneate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones, often with several rusty brown appendages at base. Flower ca. 1 cm in diam.; hypanthium campanulate. Sepals ovate, ca. 6 × 3 mm, 5-veined, margin entire, apex rounded. Petals yellow, obovate or oblong, 8–10 × 5–6 mm, 5–7-veined, margin entire, apex rounded. Anthers oblong, 0.5–1 mm; filaments flat; staminodes flat, ca. 3.2 mm, stalk ca. 1.2 mm, lamina ca. 2 × 2.8 mm, 3-lobed for 1/5–1/4(or 1/2) its length, lobes shortly linear, apex truncate or rounded. Ovary ovoid; styles ca. 1 mm, 3-lobed at apex. Capsule unknown. Fl. Aug.

- Tsuga forests; ca. 3700 m. S Xizang.


云南梅花草 yun mei hua cao
Stems 3 or 4(or 5), (5–)13–40 cm, with 1 leaf near base. Basal leaves 3–8; petiole ca. 3–7(or 13) cm; leaf blade abaxially greenish, adaxially deep green or brown-green, elliptic or ovate-oblong, rarely oblong, 2.3–7.5 × 1.5–2.8 mm, thick textured or thin and papery, base subcuneate, sometimes truncate, apex acute or shortly acuminate. Cauline leaf similar to basal ones but smaller, often with a few rusty brown appendages at base. Flower 2.8–3.4 cm in diam.; hypanthium shortly turbinate. Sepals oblong or ovate-oblong, ca. 1.1 × 1.5 mm, base often with several rusty brown appendages, margin entire, apex rounded. Petals white, densely purple punctate, broadly obovate, ca. 8 × 5 mm, 5-veined, base cuneate, occasionally sparsely and shortly fimbriate, margin sparsely erose, apex truncate, emarginate, or indistinctly cleft. Anthers ellipsoid, ca. 1 mm; filaments unequal; staminodes flat, ca. 1.6 mm, stalk ca. 0.5 mm, lamina ca. 1.1 mm, 3-lobed to middle, lobes oblong. Ovary semi-inferior, ovoid; style ca. 0.5 mm; stigma 3-lobed, lobes obovate, becoming reflexed. Capsule unknown. Fl. Aug.

- Grassy slopes; ca. 4200 m. NW Yunnan (Dêqên Xian).

In habit, this species most closely resembles Parnassia trinervis, which differs in having taller stems, 7–20(–30) cm, a sessile cauline leaf, and oblanceolate petals, rounded and entire at the apex.


倒卵瓣梅花草 dao nuan bai mei hua cao
Stem 1, ca. 6 cm, with 1 leaf near base. Basal leaves 2–4; petiole 5–11 mm; leaf blade densely purple-brown punctate, ovate-cordate, ca. 1 cm × 3–8 mm, arcuate 5-veined, base cordate, apex rounded-obtuse. Cauline leaf shortly petiolate or semiamplexicaul, similar to basal ones but much smaller, base often with several rusty brown appendages. Flower ca. 1.6 cm in diam.; hypanthium turbinate. Sepals oblong or ovate-oblong, ca. 3.1 × 1.5 mm, base often with several rusty brown appendages, margin entire, apex rounded. Petals white, densely purple punctate, broadly obovate, ca. 8 × 5 mm, 5-veined, base cuneate, occasionally sparsely and shortly fimbriate, margin sparsely erose, apex truncate, emarginate, or indistinctly cleft. Anthers ellipsoid, ca. 1 mm; filaments unequal; staminodes flat, ca. 1.6 mm, stalk ca. 0.5 mm, lamina ca. 1.1 mm, 3-lobed to middle, lobes oblong. Ovary semi-inferior, ovoid; style ca. 0.5 mm; stigma 3-lobed, lobes obovate, becoming reflexed. Capsule unknown. Fl. Aug.

- Moist places in scrub, meadows in glacial valleys; 3000–3900 m. SE Xizang (Zayü Xian), NW Yunnan (Dêqên Xian).
densely purple-brown punctate, obovate, ca. 8 × 4 mm, 3-veined, base attenuate, margin sparsely erose. Anthers ellipsoid, ca. 0.8 mm; filaments (0.6–)4 mm; staminodes flat, ca. 2 mm, stalk ca. 1 × 0.5 mm, lamina ca. 1 mm wide, 3-lobed to middle, lobes oblong. Ovary ovoid; style ca. 1.5 mm; stigma ca. 3-lobed, lobes capitate. Capsule unknown. Fl. Jul–Aug.

37. **Parnassia trinervis** Drude, Linnaea 39: 322. 1875.

三脉梅花草 san mai mei hua cao

Stems (1 or)2–4(–8), 7–20(–30) cm, with 1 leaf near base. Basal leaves 7–9; petiole brown- striate, 0.8–1.5(–4) cm; leaf blade oblong, oblong-lanceolate, or ovate-oblong, 0.8–1.5 cm × 5–12 mm, arcuate 3–5-veined with veins prominent abaxially, base subcordate, truncate, or attenuate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but slightly smaller, occasionally with a few rusty brown, hairlike appendages at base. Flower ca. 1 cm in diam.; hypanthium turbinate. Sepals lanceolate or oblong-lanceolate, ca. 4 × 1.5 mm, 3-veined abaxially, margin entire, apex obtuse. Petals white, oblong-lanceolate, ca. 7.8 × 2 mm, 3-veined, base cuneate into a claw ca. 1.5 mm, margin entire, apex rounded, whole. Anthers ellipsoid; filaments 1.5–2 mm; staminodes flat, ca. 2.5 mm, stalk ca. 1 × 0.7 mm, lamina ca. 1.3 mm wide, 3-lobed, lobes shortly clavate. Ovary semi-inferior, oblong; style ca. 0.5 mm; stigma 3-lobed. Capsule 3-valved. Seeds brown, glossy, oblong. Fl. Jul–Aug., fr. Sep.

• Moist places in valleys, marshy meadows, river beaches; 3100–4500 m. Gansu, Qinghai, Sichuan, Xizang.


绿花梅花草 lu hua mei hua cao

*Parnassia laxmannii* var. *viridiflora* (Batalin) Pallas var. *viridiflora* (Batalin) Diels; *P. runcifolia* Brieger ex Limpricht; *P. trinervis* Drude var. *viridiflora* (Batalin) Handel-Mazzetti.

Stems 1–5, 9.5–20.5 cm, with 1 leaf near base. Basal leaves (1 or)2–4(–5); petiole (1–)1.5–2.5 cm; leaf blade purple punctate or not, ovate-elliptic or triangular-ovate, rarely ovate-cordate, 1.2–1.5 cm × 0.6–1.5 mm, arcuate 5–7-veined with veins prominent abaxially, base broadly cuneate, subtruncate, or attenuate, apex obtuse or subacute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but much smaller, sometimes with a few rusty brown appendages at base. Flower 1.3–1.8 cm in diam.; hypanthium turbinate. Sepals inconspicuously minutely brown punctate abaxially, ovate-lanceolate or oblong-lanceolate, 3.5–5 × 1.5–1.8 mm, 3-veined abaxially, margin entire, apex obtuse. Petals green, purplish veined, occasionally purple punctate, oblong-lanceolate or narrowly oblong, 7–8 × 2–2.5 mm, 5-veined, base attenuate into a claw 1.5–2 mm, margin entire, apex rounded. Anthers ellipsoid, ca. 1 mm; filaments ca. 3.5 mm; staminodes flat, ca. 2.5 mm, stalk ca. 1 × 0.8 mm, lamina ca. 1.5 × 1.5 mm, 3-lobed, lobes truncate at apex. Ovary semi-inferior, ellipsoid; style ca. 0.5 mm; stigma 3-lobed, lobes obolate. Capsule elliptoid. Seeds brown, glossy, oblong. Fl. Aug. and fr. Sep.

• Alpine meadows, grassy slopes; 2900–4200 m. SE Xizang, NW Yunnan.


指裂梅花草 zhi lie mei hua cao

Stems 1–4, 14–19 cm, with 1 leaf distally. Basal leaves 2 or 3; petiole 5–9 cm; leaf blade abaxially greenish, adaxially brown-green, reniform or ovate-cordate, 1.6–3.5 × 2.5–4 cm, arcuate 7–9-veined, base deeply cordate, apex rounded, obtusely apiculate. Cauline leaf sessile, semiamplexicaul, ovate-cordate, 1.2–2.9 × 1–2.5 cm, base deeply cordate, sometimes with a few rusty brown appendages. Flower 2.5–5 cm in diam.; hypanthium shallowly campanulate. Sepals adaxially purple punctate, ovate-lanceolate or lanceolate, 6–7 × 2.5 mm, midvein distinct abaxially, margin entire, apex rounded. Petals white or yellowish green, narrowly lanceolate, 1.2–1.5 cm × (2–)3–3.8 mm, 3-veined, base with a distinct claw 2.5–4 mm, margin sparsely long fimbriate, apex acuminate. Anthers oblong, ca. 1.2 mm; filaments 6–7 mm; staminodes flat, stalk ca. 1.8 × 1.1 mm, lamina 3-lobed, lateral lobes lanceolate, to 1.5 mm, 2–3 × as long as central lobe. Ovary superior; style ca. 1.8 mm; stigma 3-lobed. Capsule obconical-ovoid, trigonous, 3-valved. Seeds black-brown, glossy, oblong. Fl. Jul–Aug., fr. Sep.

Tsuga forests on slopes, sandy banks; 2400–2800 m. SE Xizang (Mêdog Xian) [Bhutan, Sikkim].

40. **Parnassia laxmannii** Pallas ex Schultes in Roemer & Schultes, Syst. Veg. 4: 696. 1820.

新疆梅花草 xin jiang mei hua cao

*Parnassia subacaulis* Karelín & Kirilov.

Stems 2 or 3(–5), 7.5–25 cm, with 1 leaf near base. Basal leaves (2–)3; petiole 0.5–1.8 cm; leaf blade abaxially greenish, adaxially deep green, ovate or long ovate, 1–2.5 × 0.6–1.5 cm, conspicuously 3–5-veined abaxially, base truncate, subcordate, or attenuate, apex obtuse. Cauline leaf sessile, semiamplexicaul, similar to basal ones but slightly smaller, occasionally with a few caducous, rusty brown, hairlike appendages at base. Flower ca. 2 cm in diam.; hypanthium campanulate. Sepals lanceolate, ca. 3.5 × 1.5 mm, 3-veined, margin entire, apex obtuse. Petals white, brown veined, obovate, rarely spatulate, 0.6–1.3 cm × 5–6 mm, 5-veined, base attenuate into a claw ca. 1.5 mm. Anthers oblong, ca. 1.2 mm; filaments ca. 3 mm; staminodes


倒卵叶梅花草 dao nuan ye mai hua cao
Stems (2 or)3(or 4), 20–22 cm, with 1 leaf near middle or distally. Basal leaves 3–6, in a rosette; petiole 5–11 cm; leaf blade abaxially greenish, adaxially deep green, oblong-obovate, 4 × 2.5–6 cm, 5–7-veined with veins parallel in proximal 2/3, prominent abaxially, and impressed adaxially, base cuneate, apex rounded, often obtusely apiculate. Cauline leaf sessile, semiamplexicaul, ovate or broadly ovate, 1.2–2 × 1.5–2.4 cm, base subcordate, often with several rusty brown appendages. Flower of this species is similar to the species mentioned above, but differs in having the central staminode lobe ca. 0.6 cm, longer than the lateral ones, with the apex truncate or rounded.


丽江梅花草 li jiang mei hua cao
Stems usually 1 or 2, slender, 4–6 cm, with 2 leaves near middle. Basal leaves 3–5; petiole 4–10 mm; leaf blade abaxially greenish, adaxially deep green, ovate-cordate or broadly ovate, 5–8 × 4–9 mm, base subcordate, apex rounded or obtuse. Cauline leaves sessile, semiamplexicaul, similar to basal ones but smaller, often with several caducous, rusty brown appendages at base. Flower 1–1.3 cm in diam.; hypanthium turbinate. Sepals abaxially densely brown punctate, oblong, ca. 3 × 1.3 mm, inconspicuously 3-veined, margin entire, apex rounded-obtuse. Petals white, densely brown punctate on both surfaces, oblong-obovate, ca. 5 × 3 mm, 3–5-veined, base attenuate, margin entire, apex 2-lobulate or emarginate. Anthers oblong; filaments ca. 2.5 mm; stamnodes flat, ca. 2.7 mm, stalk ca. 1 mm, lamina 3-lobed to middle, rarely irregularly 4- or 5-lobed, lobes linear. Ovary superior, obovoid, depressed at apex; style ca. 8 mm; stigma 3-lobed, lobes oblong. Capsule unknown. Fl. Aug.
• NW Yunnan (Lijiang Naxi Zu Zizhixian).


短柱梅花草 duan zhu mei hua cao
Parnassia delavayi Franchet var. brevistyla Brieger ex Lindl., loc. cit., p. 108. 1922; P. appendiculata A. Batalin; P. souliei Franchet ex Nekrassova.
Stems 1–5, 11–23 cm, with 1 leaf near middle or distally. Basal leaves 2–6; petiole 3–14 cm; leaf blade abaxially greenish, adaxially deep green, ovate-cordate or ovate, 1.8–2.5 × 1.5–3.5 cm, 5–7(–9)-veined abaxially, base deeply cordate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but usually smaller, base often with several rusty brown appendages sometimes connate into small lamellae. Flower 1.8–3(–5) cm in diam.; hypanthium shallow. Sepals adaxially often purple-brown punctate, oblong, ovate, or ovate-oblong, 4–11 × 3–8 mm, midvein conspicuous, margin entire, apex rounded. Petals white, purple veined, densely brown punctate, broadly obovate or oblong-obovate, 1–1.5(–2.5) × 0.5–1 cm, 5–7-veined, base attenuate into a claw 1.8–4 mm, margin shortly fimbriate in proximal 1/3, irregularly erose in distal 2/3, apex rounded. Anthers ellipsoid, ca. 2 mm, connective projected at apex into a lanceolate appendage ca. 5 mm; filaments ca. 5 mm; stamnodes flat, 2.5–4 mm, stalk 2.5–4 mm, lamina ca. 4.5 mm wide, 3-lobed, lobes lanceolate or oblong, lateral one often 2-lobulate. Ovary superior, ovoid; style short; stigma 3-lobed, lobes short. Capsule obovoid-globose. Seeds brown, glossy, oblong. Fl. Jul.–Aug. fr. Sep.
base deeply cordate, apex rounded, apiculate, or obtusely apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, rarely larger, often with 2 or 3 caducous, rusty brown appendages at base. Flower 3–3.5 cm in diam.; hypanthium obconical. Sepals densely brown punctate, oblong, ovate, or obovate, 6–8 × 4–6 mm, 3–5(–7)-veined, margin entire, apex rounded-obtuse. Petals white, purple veined, densely purple-brown punctate, oblong- or spatulate-ovobvate, (1–)1.2–2.5 × 0.6–0.9 cm, 5-veined, base attenuate, margin sparingly and shortly fimbriate in proximal 1/3, apex rounded or acute. Anthers ellipsoid, connective projected at apex into a lanceolate appendage, to 5 mm; filaments 1–5.5 mm; staminodes flat, 3.5–4 mm, 3-lobed, lobes 1.5–1.8 mm. Ovary superior, depressed globose; style ca. 1.8 mm; stigma 3-lobed, lobes 1.5–1.8 mm. Anthers ellipsoid, connective projected at apex into a lanceolate appendage, to 5 mm; filaments 1–5.5 mm; staminodes flat, 3.5–4 mm, 3-lobed, lobes 1.5–1.8 mm. Ovary superior, depressed globose; style ca. 1.8 mm; stigma 3-lobed, lobes 1.5–1.8 mm.


细裂梅花草 xi lie mei hua cao
Stems 1–3, 11–28 cm, with 1 leaf distally. Basal leaves 2–4; petiole 4–14 cm; leaf blade purple-brown punctate, reniform, 2–5.5 × 2.5–7 cm, 7–9-veined with veins prominent abaxially, base deeply cordate, apex rounded, apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, sometimes with 2 or 3 caducous, rusty brown appendages at base. Flower 2.5–3.5 cm in diam.; hypanthium shallow. Sepals adaxially brownish punctate, oblong or obovate-oblong, 6–12 × 4–8 mm, 3–5-veined, margin entire, apex rounded. Petals white, brownish veined, purple punctate, obovate-obvate, 1.5–2 cm × 7–9 mm, 5-veined, base cuneate, margin shortly fimbriate in proximal 1/3, irregularly erose distally, apex acuminate. Anthers ellipsoid, ca. 1.5 mm, connective projected at apex into a lanceolate appendage to 5 mm; filaments 1.5–6.5 mm; staminodes flat, 5 × 3.5 mm, 3-lobed for ca. 2/3 their length, central lobe lanceolate, lateral ones falcate, narrower than central one. Ovary superior, globose; style ca. 1 mm; stigma 3-lobed, lobes short. Capsule unknown. Fl. Jul–Aug.  


双叶梅花草 shuang ye mei hua cao
Stem 1(or 2), 10–50 cm, with 2 leaves proximally or near middle. Basal leaves 2–7, sometimes forming a rosette; petiole 3–7 cm; leaf blade abaxially greenish, densely purple-brown punctate, adaxially deep green, oblong-ovate, 1.5–3.5 × 1–2.1 cm, 5(–7)-veined with veins prominent abaxially and impressed adaxially, base subcordate or subtruncate, apex rounded-obtuse, sometimes apiculate. Cauline leaves alternate, sessile or mostly shortly petiolate, inconspicuously brown punctate, similar to basal ones but (0.6–)1–2.9 × (0.5–)1.5 cm, 3–5-veined, with 2 or 3 caducous, rusty brown appendages at base. Flower 2–2.9 cm in diam.; hypanthium turbinate. Sepals purple-brown punctate, lanceolate, 7–9 × 2–2.5 mm, 5(–7)-veined, margin entire, apex acuminate. Petals erect, white, spatulate, 1.4–1.7 cm × 6–8 mm, base cuneate into a claw ca. 2 mm, margin entire, apex rounded. Anthers ellipsoid, ca. 1.5 mm; filaments 5–6 mm; staminodes deep brown, flat, ca. 5 mm, stalk ca. 1.5 × 1 mm, lamina 3–3.5 × ca. 2 mm, 2-lobed, lobes lanceolate or oblong, 1.5–2 mm. Ovary ovoid-globose; style short; stigma 3-lobed, lobes short. Capsule unknown. Fl. Jul–Aug. fr. Aug. 

Forests, shaded slopes, streamsides; 2200–2800 m. Xinjiang [Russia].
This species is used medicinally.


宽叶梅花草 kuan ye mei hua cao

Stems 2–4, 8–10 cm, with 1 leaf proximally. Basal leaves several; petiole slender, 2–4 cm; leaf blade abaxially greenish, densely brown punctate, adaxially deep green, broadly orbicular, rarely suborbicular, 1.2–2 × 1.4–2.5 cm, conspicuously 5–7-veined on both surfaces, base truncate, apex truncate, apiculate. Cauline leaf sessile, semiamplexicaul, broadly ovate or reniform, ca. 1 × 1.5 cm, base truncate or subcordate, often with several rusty brown appendages. Flower ca. 1.5 cm in diam.; hypanthium turbinate. Sepals densely purple-brown punctate on both surfaces, oblong or ovate, ca. 4.5 × 3 mm, margin entire, apex obtuse. Petals white, densely purple-brown punctate, spatulate, ca. 8 × 4 mm, base cuneate, margin long fimbriate in proximal 2/3, apex rounded or obtuse. Anthers subglobose, ca. 2 mm; filaments ca. 5.5 mm; staminodes flat, ca. 4.5 mm, (3 or) 4- or 5-lobed, lobes often with inconspicuous, globose glands at apex. Ovary ovoid; style ca. 2 mm; stigma 3-lobed, lobes short. Capsule unknown. Fl. Aug–Sep.

• Moist streamsides on slopes; 1800–1900 m. NE Yunnan (Yiliang Xian).


大叶梅花草 da ye mei hua cao

Stems 2–4, ca. 24 cm, with 1 leaf near middle. Basal leaves petiolate; leaf blade abaxially greenish, adaxially deep green, oblong-ovate, to 7 cm, 7-veined abaxially, base cordate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but much smaller. Flower ca. 3 cm in diam.; hypanthium inconspicuous. Sepals unequal, larger ones to 1.2 cm. Petals white, spatulate, base attenuate into a long claw, margin fimbriate with fimbriae capitae at apex, apex rounded. Staminodes 5-lobed, lobes narrowly oblong. Style inconspicuous; stigma spreading.

• NE Yunnan (Yanjin Xian).

The present authors have seen no specimens of this species; the above description is based on the protologue and a photograph of the type specimen.


彝良梅花草 yi liang mei hua cao

Stems ca. 3, ca. 10 cm, with 1 leaf proximally. Basal leaves ca. 6; petiole 2.5–3.5 cm; leaf blade abaxially greenish, densely purple punctate, adaxially deep green, reniform, 1.5–2.5 × 1.8–3 cm, conspicuously arcuate 7–9-veined abaxially, base deeply cordate, apex rounded, apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base sometimes with a few caducous, rusty brown appendages. Flower ca. 1.8 cm in diam.; hypanthium inconspicuous. Sepals oblong, ca. 5 × 2.5 mm, conspicuously parallel veined adaxially, margin entire, apex rounded. Petals white, spatulate, ca. 1.1 cm × 5 mm, base cuneate into a claw ca. 1.2 mm, margin long fimbriate in proximal 2/3, entire or repand in distal 1/3, apex rounded. Anthers oblong, ca. 2 mm; filaments 1.6–5.5 mm; staminodes flat, ca. 4 mm, 5-parted, 3 central lobes ca. 2.5 mm, 2 lateral ones ca. 0.8 mm. Ovary superior, densely purple punctate, obovoid; style ca. 1.8 mm; stigma 3-lobed, lobes short. Capsule unknown. Fl. Aug–Sep.

• Moist streamsides on slopes; 1800–1900 m. NE Yunnan (Yiliang Xian).


城口梅花草 cheng kou mei hua cao

Stems 3 or 4, 14–20 cm, with 1 leaf proximally or near middle. Basal leaves 3 or 4; petiole 5–10 cm; leaf blade abaxially pale green, inconspicuously brown punctate, adaxially brown-green, ovate-cordate, 2.5–4.4 × 2.5–4.2 cm, 7–9-veined, base deeply cordate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base cordate, sometimes with a few rusty brown appendages. Flower ca. 1.5 cm in diam.; hypanthium shortly turbinate. Sepals densely brown punctate, oblong-lanceolate, ca. 5 × 3 mm midvein conspicuous, margin entire, apex acuminate. Petals white, obovate-oblong, ca. 9 × 3.5 mm, base attenuate into a claw ca. 1 mm, margin long fimbriate in proximal 2/3, entire in distal 1/3. Anthers oblong, 0.5–1 mm; filaments ca. 5 mm; staminodes flat, ca. 3 mm, (3–)5-lobed, lobes unequal, with inconspicuous glands at apex. Ovary ovoid; style ca. 1.8 mm; stigma 3-lobed, lobes ovate. Capsule ovoid. Seeds brown, glossy, oblong. Fl. Aug–Sep, fr. Sep.

• Grasslands. NE Sichuan (Chengkou Xian).

In habit, this species resembles Parnassia crassifolia, which differs in having a larger flower, 1.5–2.5 cm in diam., and staminodes 3-lobed to the middle. In leaf shape, P. chengkouensis is similar to P. perciliata, which differs in having a larger flower, 1.5–3 cm in diam., and petal margins long fimbriate throughout.


金顶梅花草 jin diang mei hua cao

Stems 1 or 2, ca. 10 cm, with 1 leaf proximally. Basal leaves 6 or 7; petiole 2.5–3.5 cm; leaf blade abaxially greenish, purple-brown punctate, adaxially brown-green, cordate, rarely ovate-cordate, 6–7 × 6–7 mm, base deeply cordate, apex acuminate. Cauline leaf similar to
basal ones but smaller, abaxially densely brown punctate, base often with several rusty brown appendages sometimes conuate into small lamellae. Flower ca. 1.3 cm in diam.; hypanthium inconspicuous. Sepals oblong, 3.5–4 × 1.8–2 mm, 5-veined abaxially, margin entire, apex rounded-oblute. Petals white, densely purple-brown punctate on both surfaces, broadly obovate, 6 × 4 mm, 5-veined on both surfaces, base cuneate, margin sparingly and shortly fimbriate, apex rounded. Anthers ellipsoid, ca. 1.8 mm; filaments ca. 4 mm; staminodes deep purple, flat, ca. 1.8 mm, 5-lobed, lobes unequal. Ovary superior, ovoid; style short; stigma 3-lobed, lobes obvolute. Capsule unknown. Fl. Aug.

- Shaded and moist places on grassy slopes; ca. 3100 m. C Sichuan (Emei Shan). In habit, this species most closely resembles *Parnassia chinensis var. sechuanensis*, which is easily distinguished by its apically 3-lobed staminodes.


叙永梅花草 xu yong mei hua cao

Stems 2–5, 8–12 cm, with 3 or 4 leaves. Basal leaves 2 or 3; petiole 2.5–9 cm; leaf blade abaxially greenish, adaxially brown-green, broadly obovate, 5.5 × 1.2–3 cm, 7-veined abaxially, base narrowed or subtruncate, apex acute. Cauline leaves sessile, not amplexicaul, lanceolate, ca. 1/2 as long as basal leaves, base with sparse, rusty brown appendages. Flower 1–1.5 cm in diam.; hypanthium inconspicuous. Sepals brown punctate, oblong or narrowly ovate, 6–7 × ca. 4 mm, 3-veined, margin entire, apex obtuse. Petals white, brown punctate, oblong, 1–1.2 × ca. 1 cm, many veined, base cuneate into a claw ca. 1 mm, margin subentire or undulate. Anthers oblong, ca. 1 mm; filaments 4–5 mm; staminodes 3–4 mm, divided into 3 filiform rays with globose glands at apex. Ovary superior; style short; stigma 4-lobed. Capsule unknown. Fl. Jul–Aug.

- Shaded moist grassy slopes; 2000–2500 m. C and NE Sichuan (Baoshan Xian, Chengkou Xian). The present authors have not seen the type specimen of *Parnassia rhombipetala*, and the above description is translated from the protologue. It is noteworthy that this species has some peculiar morphological characters, e.g., oblongate or narrowly ovate basal leaf blades and rhomboid petals subentire or undulate at the margin.


南川梅花草 nan chuan mei hua cao

Stems 1–5, 10–20 cm, with 3–6 leaves. Basal leaves 3–5, forming a rosette; petiole slender, 2.5–4.5 cm; leaf blade abaxially greenish, adaxially deep green, reniform, 1.1–2.3 × 1.2–2.6 cm, 5–7-veined with veins prominent abaxially, base deeply cordate, apex rounded, apiculate. Cauline leaves subreniform or suborbicular, subequare, ca. 5 × 8–10 mm, smaller than basal ones, base deeply cordate, sometimes with a few rusty brown appendages. Flower 1–1.6 cm in diam.; hypanthium inconspicuous. Sepals purple punctate, oblong or long elliptic, 3.5–5 × 2–2.2 mm, 3-veined, margin entire, apex rounded-obtuse. Petals snow white, purple punctate, oblong-lanceolate or ovate-oblanceolate, ca. 7.5 × 2.5 mm, 3-veined, base cuneate, margin long fimbriate in proximal 2/3, apex rounded, sometimes sparsely erose. Anthers ellipsoid, ca. 1 mm; filaments ca. 4.5 mm; staminodes ca. 9 mm, divided for 2/5 their length into 3 filiform rays with globose glands at apex. Ovary superior, subglobose; style ca. 0.4 mm; stigma 3- or 4-lobed. Capsule depressed globose. Seeds brown, glossy, oblong. Fl. Aug–Sep. fr. Sep.


棒状梅花草 bang zhuang mei hua cao

Stems 1–3, 15–20 cm, with 2–5 leaves. Basal leaves 2–4; petiole slender, 3–5.5 cm; leaf blade abaxially greenish, adaxially deep green, reniform, 1.2–2.2 × 1.8–3 cm, 7-veined abaxially, base deeply cordate, apex rounded, apiculate. Cauline leaves reniform or suborbicular, 0.4–1.8 × 0.6–1.8 cm, base deeply cordate, sometimes with a few caducous, rusty brown appendages. Flower ca. 1.5 cm in diam.; hypanthium inconspicuous. Sepals lanceolate or ovate-lanceolate, ca. 3.5 × 1.5 mm, 3-veined, margin entire, apex acuminate. Petals white, obovate or oblong, ca. 5.5 × 1.2 mm, base attenuate, margin fimbriate throughout with fimbriae turgid at apex and becoming clavate, apex rounded. Anthers ellipsoid, ca. 1.2 mm; filaments ca. 5 mm; staminodes 3–4 mm, divided into 3 rays or narrowly linear lobes 1.2–1.5 mm with globose glands at apex. Ovary superior, ovoid; style very short; stigma 3- or 4-lobed. Capsule densely purple punctate, depressed globose. Seeds brown, glossy, oblong. Fl. Jul–Aug, fr. Sep.

- Moist rocks in forests; 1500–1800 m. SE Sichuan (Nanchuan Xian).
ca. 6.5 mm; staminodes 4–5 mm, divided proximally into 3 filiform rays with globose glands at apex. Ovary superior, depressed ovoid or ovoid-globose; style ca. 2 mm; stigma 3-lobed. Capsule depressed globose, 3- or 4-valved. Seeds brown, glossy, oblong. Fl. Aug–Sep, fr. Sep.

Slopes, stream sides, moist road sides; 1100–2000 m. S Anhui (Huang Shan), W Fujian (Jiangning Xian), N and W Jiangxi (Lu Shan, Wugong Shan), NW Zhejiang (Tianmu Shan) [N India, Japan].

This species is used medicinally.


桂林梅花草 gui lin mei hua cao

Stems 1 or 2, 10–20 cm, usually with 1 leaf near middle. Basal leaves (7 or)8(–13); petiole 1–9 cm; leaf blade abaxially gray-white, adaxially green, ovate to obovate-ovate, (1–)2.5–4.5(–5.5) × (0.8–)1.5–2.5(–3) cm, inconspicuously 5–7-veined on both surfaces, base rounded or subtruncate, apex obtuse or acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller. Flower ca. 2 cm in diam.; hypanthium inconspicuous. Sepals green, ovate, ca. 5 × 4 mm. Petals white, broadly obovate, ca. 1.2 cm × 8 mm, base with a claw ca. 3 mm, margin slightly undulate, apex emarginate. Anthers ellipsoid; filaments 2–7 mm; staminodes ca. 3 mm, 5-branched to middle, branches globose glandular at apex. Ovary superior, yellowish, ovoid, ca. 1.5 cm; styles ca. 1 mm; stigma slightly cleft. Fl. Aug.

• Streamsides; ca. 600 m, NE Guangxi (Xing'an Xian).

The present authors have seen no specimens of this species; the above description is based on the protologue.


甘肃梅花草 gan su mei hua cao

Stems 1–8, 10–20 cm, usually with 1 leaf near middle. Basal leaves 2 to several; petiole slender, 2–9 cm; leaf blade abaxially greenish, occasionally purple punctate, adaxially deep green, ovate-cordate, 1–2.2 × 1.3–2 cm, arcuate 5–7-veined abaxially, base deeply cordate, apex acute. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base with rusty brown, filiform appendages sometimes adnate to blade. Flower 1.5–2.1 cm in diam.; hypanthium shortly turbinate. Sepals reflexed and persistent after anthesis, densely purple punctate, obovate or oblong, 3–6 × 3–4 mm, 1–3-veined, margin entire, apex rounded. Petals white, obovate-lanceolate or oblong-lanceolate, ca. 1 cm × 5 mm, base attenuate, margin fimbriate proximally, entire or undulate distally, apex rounded. Anthers ellipsoid, ca. 2 mm; filaments ca. 8 mm; staminodes 4–9 mm, divided almost to base into 5 filiform rays with globose glands at apex. Ovary slightly sunken into hypanthium, ovoid, ca. 5 mm; style 1.5–2 mm; stigma 3-lobed, lobes ovate. Capsule unknown. Fl. Jul–Aug.

• Streamsides, shaded and moist places; 1300–3500 m. S Gansu.


思茅梅花草 si mao mei hua cao

Stem 1, 8–22 cm, with 1 leaf proximally. Basal leaves 5–12; petiole 1–3 cm; leaf blade abaxially green, adaxially gray-green, conspicuously punctate on both surfaces, ovate-cordate, 0.7–2 × 0.6–1.9 cm, (5–)7-veined basally, base deeply cordate, apex acute. Cauline leaf sessile, amplexicaul, similar to basal ones but smaller, base often with several rusty brown appendages. Flower 1.8–2.2 cm in diam.; hypanthium shortly turbinate. Sepals reflexed and persistent after anthesis, pale green, brown punctate, ovate, 3–5 × 2–3 cm, 1–3-veined, margin fimbriate proximally, apex rounded. Petals white, brownish punctate, obovate or narrowly so, 6–12 × 3–6 mm, base attenuate into a claw ca. 1 mm, margin long fimbriate proximally, sparsely fimbriate to undulate distally, apex rounded. Anthers ellipsoid; 2–2.5 mm; staminodes 3.5–4 mm, divided for ca. 1/2 their length into 5 filiform rays, apex with globose glands. Ovary slightly sunken into hypanthium, ovoid, 3–4 mm; style 2–2.5 mm; stigma 3-lobed, lobes oblong. Capsule depressed trigonous when young. Fl. Sep–Nov, fr. Oct–Nov.

• Bogs; ca. 1400 m. S Yunnan (Simao Xian).

The present authors have seen no specimens of *Parnassia simaoensis*; the above description is based on the protologue, in which it was compared with *P. gansuensis*, which differs in having staminodes divided almost to the base.


龙胜梅花草 long sheng mei hua cao

Stems 5 or 6, 15–28 cm, with 1 leaf near middle or distally. Basal leaves often 6–8, forming a rosette; petiole slender, 9.5–13 cm; leaf blade abaxially greenish, adaxially deep green, broadly orbicular, 2–3 × 2.7–4.5 cm, arcuate 7–9-veined with veins prominent abaxially and inconspicuous adaxially, base subcordate, apex concave and apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal ones but smaller, base often with several rusty brown appendages sometimes connate into small lamellae. Flower 2.2–3.3 cm in diam.; hypanthium very short. Sepals reflexed and persistent after anthesis, densely purple punctate, oblong, 6–7 × 3–5 mm, midvein conspicuous, margin entire, apex obtuse, sometimes apiculate. Petals white, densely purple punctate, obovate-lanceolate, 1–1.2 cm × 4–5 mm, 3–5-veined, base attenuate, margin long fimbriate in proximal 2/3, undulate in distal 1/3. Anthers ellipsoid, ca. 2 mm; filaments ca. 7.5 mm; staminodes 4–5 mm, divided for up to 1/2 their length into 5 branches with globose glands at apex. Ovary slightly sunken into hypanthium, trigonous; style ca. 1.8 mm; stigma 3-

- Woods, moist places, rocks by streams. NE Guangxi (Longsheng Ge Zu Zizhixian, Xiang Xian).

In habit, this species somewhat resembles *Parnassia dilatata*, which differs in having smaller basal leaf blades, 1.2–2 × 1.4–2.5 cm, with shorter petioles, 2–4 cm, and flat, (3 or) 4- or 5-lobed staminodes, with inconspicuous, globose glands at the apex.


**厚叶梅花草**  hou ye mei hua cao

Stems 3–5, robust, slightly curved, 18–30 cm, with 1 leaf distally. Basal leaves 3–5, forming a rosette; petiole robust, 8–19 cm; leaf blade sparsely purple punctate, densely along veins, ovate-cordate, 3.5–6.5 × 2.5–5.5 cm, 7-veined adaxially with midvein prominent abaxially, base deeply cordate, apex acuminate, often apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal ones but 2.2–4 × 2–3 cm, base often with rusty brown appendages sometimes conuate into small lamellae. Flower 1.5–3 cm in diam.; hypanthium very short. Sepals reflexed and persistent after anthesis, brown punctate on both surfaces, oblong or oblong-lanceolate, ca. 1 cm × 5 mm, 1-veined, margin with sparse, rusty brown appendages proximally, entire distally, apex obtuse. Petals white, purple veined, sparsely purple punctate, obovate-oblong or oblong, 0.8–1.3 cm × 5–8 mm, 3-veined, base abruptly contracted into a claw, margin long fimbriate throughout, apex rounded or acute. Anthers ellipsoid, ca. 3 mm; filaments 6–8 mm; staminodes ca. 4 mm, branches 5–7, with globose glands at apex. Ovary superior, ovoid; style ca. 1.8 mm; stigma 3-lobed, lobes short. Capsule unknown. Fl. Jul–Aug.

- Rocky places; ca. 1100 m. SE Sichuan (Nanchuan Xian).


**大卫梅花草**  da wei mei hua cao

Stems 2 or 3, ca. 23 cm, with 1 leaf near middle or distally. Basal leaves 4 or 5; petiole 4–6 cm; leaf blade abaxially greenish, adaxially deep green, densely purple-brown punctate, reniform, ovate, oblong, or suborbicular, 1.8–2 × 2.2–2.5 cm, base subcordate, subtruncate, truncate, or rarely subcuneate, apex rounded, often apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal leaves but smaller, base often with several rusty brown appendages sometimes conuate into small lamellae. Flower ca. 2.5 cm in diam.; hypanthium inconspicuous. Sepals adaxially densely purple-brown punctate, oblong, ca. 5 × 3 mm, margin entire, apex rounded. Petals white, densely purple-brown punctate, oblong, ca. 1.4 cm × 6.5 mm, conspicuously 3-veined, base cuneate, margin fimbriate, apex rounded. Anthers oblong, ca. 2.2 mm; filaments ca. 8 mm; staminodes ca. 4.5 mm, 3–7-branched to middle. Ovary superior, depressed globose; style ca. 1.2 mm; stigma 3-lobed, lobes reflexed and persistent after anthesis. Capsule unknown. Fl. Jul–Aug.

- About 1200 m. Sichuan.
  1a. Basal leaf blade reniform, base subcordate or subtruncate; staminodes 3–7-branched 62a. var. davidii
  1b. Basal leaf blade ovate or suborbicular, base truncate or subcuneate; staminodes (4 or)5-branched 62b. var. arenicola

62a. *Parnassia davidii* var. **davidii**

**大卫梅花草** (原变种)  da wei mei hua cao (yuan bian zhong)

Basal leaf blade reniform, base subcordate or subtruncate. Staminodes 3–7-branched.

- S and W Sichuan


**喜砂梅花草**  xi sha mei hua cao

Basal leaf blade ovate or suborbicular, base truncate or subcuneate. Staminodes (4 or)5-branched.

- About 1200 m. E Sichuan (Wan Xian).


**梅花草**  mei hua cao

Stems 2–4(–7), 12–20(–30) cm, usually with 1 leaf near middle. Basal leaves 3 to numerous; petiole 3–6(–8) cm; leaf blade abaxially greenish, often purple punctate, adaxially deep green, ovate or long ovate, occasionally triangular-ovate, 1.5–3 × 1–2.5 cm, base subcordate, apex rounded-obtuse or acuminate, often apiculate. Cauline leaf sessile, semiamplexicaul, similar to basal leaves, base often with several rusty brown appendages. Flower 2.2–3(–3.5) cm in diam.; hypanthium inconspicuous. Sepals densely purple-brown punctate, elliptic or oblong, 5–8 × 3–5 mm, margin entire, apex obtuse. Petals white, often purple punctate, broadly ovate or obovate, 1–1.5 × (1.8) × 0.7–1(–13) cm, base with a short claw, margin entire or occasionally inconspicuously erose, apex rounded-obtuse or shortly acuminate. Anthers ellipsoid, ca. 3 mm; filaments 2.2–7 mm; staminodes to 1 cm, divided into (7–)9–21 filiform rays with globose glands at apex. Ovary superior, ovoid; style very short; stigma 4-lobed. Capsule ovoid. Seeds brown, glossy, oblong. Fl. Jul–Sep, fr. Oct. 2n = 18, (27), 36.

Moist grassy slopes, streamsides, shaded moist places in valleys, grassy fields; 1200–2200 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shunxi, N Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia; Europe, North America].

1a. Staminodes (7–)9–11(–13)-branched 63a. var. **palustris**

63a. *Parnassia palustris* var. **palustris**

**梅花草** (原变种)  mei hua cao (yuan bian zhong)

*Parnassia mucronata* Siebold & Zuccarini; *P. palustris* f. *nana* T. C. Ku.

Staminodes (7–)9–11(–13)-branched.

Moist grassy slopes, streamside, shaded moist places in valleys; 1600–2000 m. N Xinjiang [Kazakhstan, Russia; Europe, North America].


多枝梅花草 duo zhi mei hua cao

*Parnassia multiseta* (Ledebour) Fernald.

Staminodes 13–21-branched.

Shaded places in valleys, streamside, grassy fields; 1200–2200 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shanxi [Japan, Korea, Russia].

Losina-Losinskaja (in Komarov, Fl. URSS 9: 217. 1939) divided *Parnassia palustris* into four forms. However, after examining a large number of Chinese specimens of this species, the present authors have found that *P. palustris* is highly variable in many morphological characters, e.g., height of stem, number, shape, and size of basal leaves, position, shape, and size of cauline leaf, punctate marking, shape, and venation of sepals and petals, and number and length of staminode branches. It is not possible to classify Losina-Losinskaja’s forms according to these characters. On the other hand, the present authors accept the two varieties of *P. palustris* described by Ledebour (Fl. Ross. 1: 262. 1842) based on the number of staminode branches. In the present account, according to Ledebour’s delimitation, the population in Xinjiang is identified as var. *palastris* and the populations in N and NE China as var. *multiseta*. 