

8. PRIMULA Linnaeus, Sp. Pl. 1: 142. 1753.

报春花属 bao chun hua shu

Herbs perennial, rarely annual, glabrous or pubescent, often farinose. Leaves simple, forming a rosette. Flowers usually heterostylous with pin (long-styled) and thrum (short-styled) flowers; sometimes homostylous, in umbellate, racemose, subcapitate, or spicate inflorescences on scapes, with bracts; rarely solitary and scapes undeveloped. Calyx campanulate or cylindrical, sometimes leaflike, 5-toothed. Corolla tube cylindrical, not constricted at throat; limb 5-lobed, spreading or campanulate; lobes 2-cleft, margin entire. Stamens inserted on corolla tube; filaments very short; anthers obtuse. Ovary superior. Capsule globose, ovoid, or cylindrical, dehiscing by valves, rarely with an operculum or crumpled; seeds numerous.

About 500 species: mostly indigenous to the North Temperate zone, with only a few outliers on some mountains of Africa (Ethiopia), tropical Asia (Java and Sumatra), and South America; 300 species in China.

Many species are imperfectly known, sometimes collected only once. This is reflected occasionally by missing details on pin or thrum morphology, fruiting characteristics, or ecology.

The 300 species are represented by 24 sections according to C. M. Hu: sect. *Monocarpicae* Franchet ex Pax (spp. 1–13), sect. *Obconicolisteri* I. B. Balfour (spp. 14–23), sect. *Cortusoides* I. B. Balfour (spp. 24–40), sect. *Malvacea* I. B. Balfour (spp. 41–47), sect. *Auganthus* (Link) Pax ex I. B. Balfour (spp. 48–50), sect. *Pycnoloba* I. B. Balfour (sp. 51), sect. *Ranunculoides* Chen & C. M. Hu (spp. 52–53), sect. *Primula* (sp. 54), sect. *Carolinella* (Hemsley) Pax (spp. 55–62), sect. *Bullatae* Pax (spp. 63–66), sect. *Petiolares* Pax (spp. 67–115), sect. *Proliferae* Pax (spp. 116–134), sect. *Amethystina* I. B. Balfour (spp. 135–142), sect. *Sikkimensis* I. B. Balfour (spp. 143–150), sect. *Crystalliphomis* Ruprecht (spp. 151–191), sect. *Cordifoliae* Pax (spp. 192–196), sect. *Aleuritia* Duby (spp. 197–242; spp. 238–242 are recognized in Europe and North America as sect. *Armerina*), sect. *Minutissimae* Pax (spp. 243–259), sect. *Souliei* I. B. Balfour ex W. W. Smith & Forrester (spp. 260–265), sect. *Dryadifolia* I. B. Balfour, (spp. 266–268, sect. *Denticulata* Watt (spp. 269–274), sect. *Capitatae* Pax (spp. 275–276), sect. *Muscarioides* I. B. Balfour (spp. 277–289), sect. *Soldanelloides* Pax (spp. 290–300).

- 1a. Inflorescences racemose Key 1
- 1b. Inflorescences not racemose.
 - 2a. Inflorescences spicate or capitate.
 - 3a. Corolla funnelform or tubular, lobes ± spreading Key 2
 - 3b. Corolla campanulate, lobes suberect, in line with tube Key 3
 - 2b. Inflorescences umbellate or flowers solitary.
 - 4a. Leaves pinnately divided or palmately divided and deeply lobed to middle Key 4
 - 4b. Leaves entire, dentate, or only shallowly lobed.
 - 5a. Plants ± with multicellular hairs, if glabrous, then leaf blade caudate at base.
 - 6a. Calyx cupular (shorter than wide) to broadly campanulate Key 5
 - 6b. Calyx narrowly campanulate to cylindrical, longer than wide.
 - 7a. Plants with stout woody rhizomes or base with small membranous bud scales; leaves ± bullate Key 6
 - 7b. Plants without woody rhizomes or small membranous bud scales; leaves not bullate.
 - 8a. Corolla yellow; calyx ca. as long as to longer than corolla tube Key 7
 - 8b. Corolla pink to violet; calyx shorter than corolla tube.
 - 9a. Capsule opening by a lid Key 8
 - 9b. Capsule opening by short teeth or crumpled irregularly.
 - 10a. Plants often farinose; calyx campanulate, lobes herbaceous, not conspicuously veined Key 9
 - 10b. Plants efarinose; calyx narrowly campanulate to cylindrical, lobes subleathery, with distinct vertical veins Key 10
 - 5b. Plants glabrous or scabrous-puberulent.
 - 11a. Leaves scabrous, short appressed pubescent, distinctly petiolate Key 11
 - 11b. Leaves glabrous, if scabrous-puberulent, then not distinctly petiolate.
 - 12a. Plants with a long bulblike stock formed by overlapping petioles or fleshy basal bud scales Key 12
 - 12b. Plants without a long overlapping or bulblike stock.
 - 13a. Corolla campanulate, lobes erect, in line with tube Key 13
 - 13b. Corolla funnelform, lobes usually spreading.
 - 14a. Leaf blades cordate or rounded at base, long petiolate Key 14
 - 14b. Some leaf blades attenuate at base.
 - 15a. Corolla lobes entire Key 15
 - 15b. Corolla lobes dentate, emarginate, or 2-lobed.
 - 16a. Capsule suboblong, or if globose, then plants less than 3 cm tall; involucre bracts swollen or saccate at base Key 18

- 16b. Capsule globose or ovoid-oblong, involucre bracts not swollen or saccate at base.
 17a. Scapes with 1 umbel; capsule submembranous, crumbled at maturity *Key 16*
 17b. Scapes with (1 or)2 to many umbels; capsule leathery, opening by short teeth *Key 17*

Key 1

- 1a. Racemes abbreviated, ± umbellate, less than 1.5 cm, densely flowered.
 2a. Leaf blade acute or acuminate at apex.
 3a. Leaf blade rounded or cuneate at base; calyx ca. 3 mm 55. *P. henryi*
 3b. Leaf blade cordate at base; calyx 7–10 mm 56. *P. chapaensis*
 2b. Leaf blade obtuse or rounded at apex.
 4a. Leaf blade suborbicular or ovate-rounded, 10–15 cm wide, cordate at base 57. *P. partschiana*
 4b. Leaf blade oblong to obovate, 2–5 cm wide, broadly cuneate to subrounded at base 58. *P. rugosa*
 1b. Racemes much longer than 1.5 cm or only to 5-flowered.
 5a. Calyx lobes not leaflike, glabrous inside 24. *P. pauliana*
 5b. Calyx lobes leaflike, pubescent on both sides.
 6a. Corolla yellow.
 7a. Leaf blade reniform, base deeply cordate, densely pilose abaxially 41. *P. bathangensis*
 7b. Leaf blade obovate to oblong, base attenuate or subrounded, short hirsute abaxially 42. *P. saturata*
 6b. Corolla rose, lilac, or white.
 8a. Leaves membranous; calyx parted to near base.
 9a. Leaf blade cordate to truncate at base, margin palmately lobulate 43. *P. aromatica*
 9b. Leaf blade attenuate at base, margin pinnately lobed 44. *P. runcinata*
 8b. Leaves not membranous; calyx parted to middle or slightly below.
 10a. Leaf blade suborbicular to broadly ovate 45. *P. malvacea*
 10b. Leaf blade elliptic to oblong-obovate.
 11a. Leaf blade cordate to subcordate at base, elevated reticulate abaxially 47. *P. celsiiformis*
 11b. Leaf blade broadly cuneate to subrounded at base, not elevated reticulate abaxially.
 12a. Pedicel 4–8(–15) mm; calyx 8–15 mm 46. *P. blattariformis*
 12b. Pedicel ca. 2 mm; calyx ca. 5 mm 277. *P. inopinata*

Key 2

- 1a. Inflorescences subcapitate, short pedicellate; calyx actinomorphic.
 2a. Bracts broadly ovate to elliptic, leaflike; leaf blade broadly elliptic to suborbicular, base truncate or slightly cordate, evergreen 266. *P. dryadifolia*
 2b. Bracts lanceolate to ovate-lanceolate; leaf blade not as above.
 3a. Flowers spreading or ± nodding; bracts and flower buds overlapping, forming a tuft or crown at apex 276. *P. capitata*
 3b. Flowers erect; bracts not forming a crown at apex.
 4a. Plants with basal bud scales at anthesis.
 5a. Leaves puberulent or glabrescent; corolla exannulate 269. *P. denticulata*
 5b. Leaves glabrous; corolla annulate 270. *P. monticola*
 4b. Plants without basal bud scales at anthesis.
 6a. Leaves pubescent.
 7a. Inflorescences loose; pedicel 2–5 mm; leaves pilose 273. *P. laxiuscula*
 7b. Inflorescences compact; pedicel less than 2 mm; leaves septate or scabrous glandular pubescent.
 8a. Flowering scapes (1–)4–8(–15) cm; leaves with fine scabrous glandular hairs 271. *P. atrodentata*
 8b. Flowering scapes (6–)10–30 cm; leaves with white septate hairs 272. *P. erythrocarpa*
 6b. Leaves glabrous.
 9a. Calyx parted below middle, lobes acute 275. *P. glomerata*
 9b. Calyx parted only to middle, lobes obtuse.
 10a. Inflorescences 2–4 cm in diam.; flowering scapes to 35 cm 274. *P. pseudodenticulata*
 10b. Inflorescences 1–1.5 cm in diam.; flowering scapes to 11 cm.
 11a. Leaves conspicuously denticulate; bracts not concealing pedicels 197. *P. glabra*
 11b. Leaves entire or obscurely denticulate; bracts concealing pedicels, ca.

- 1/2 as long as calyx.
- 12a. Leaves densely glandular; calyx and bracts often tinged with purple 198. *P. kongboensis*
- 12b. Leaves sparsely glandular; calyx and bracts green, puberulent 199. *P. pseudoglabra*
- 1b. Inflorescences capitate or spicate; flowers sessile, reflexed; calyx \pm zygomorphic.
- 13a. Corolla tube 1.8–4 cm, limb 2–3 cm wide 294. *P. sherriffiae*
- 13b. Corolla tube and limb usually less than 1.1 cm.
- 14a. Corolla lobes acute at apex.
- 15a. Bracts and calyx crimson; scapes glabrous 278. *P. vialii*
- 15b. Bracts and calyx green or tinged with purple; scapes sparsely pilose 279. *P. gracilentia*
- 14b. Corolla lobes rounded, truncate, or lobed at apex.
- 16a. Leaves scabrous-pubescent 280. *P. violacea*
- 16b. Leaves with long multicellular hairs or subglabrous.
- 17a. Corolla tube only slightly longer than calyx; limb subglobose 281. *P. concholoba*
- 17b. Corolla tube at least 2 \times as long as calyx, limb funnelform.
- 18a. Style of thrum flower reaching middle of corolla tube.
- 19a. Corolla deep indigo-purple; lobes nearly quadrate, apex truncate or obscurely emarginate 282. *P. watsonii*
- 19b. Corolla bluish violet to pale purple; lobes ovate to suborbicular, margin entire 283. *P. giraldiana*
- 18b. Style of thrum flower approaching base of corolla tube.
- 20a. Leaf blade obovate to oblanceolate, entire to repand-crenulate, subsessile 284. *P. cernua*
- 20b. Leaf blade usually elliptic to lanceolate, crenate, dentate, or lobed, distinctly petiolate.
- 21a. Inflorescences \pm white farinose 285. *P. bellidifolia*
- 21b. Inflorescences efarinose or yellow farinose.
- 22a. Corolla lobes spreading 286. *P. aerinantha*
- 22b. Corolla lobes \pm erect.
- 23a. Scapes pilose or subglabrous 287. *P. deflexa*
- 23b. Scapes glabrous.
- 24a. Leaf blade crenate-dentate; corolla lobes truncate to emarginate at apex 288. *P. muscarioides*
- 24b. Leaf blade deeply incised-lobulate or pinnatifid or very coarsely dentate; corolla lobes rounded or nearly so at apex 289. *P. pinnatifida*

Key 3

- 1a. Scapes and corolla with multicellular hairs 290. *P. buryana*
- 1b. Scapes and corolla glabrous or minutely glandular.
- 2a. Flowers 4–7 mm in diam.; leaf blade ca. 1 cm.
- 3a. Scapes glandular; leaves coarsely pinnatifid-dentate, with obtuse teeth 291. *P. sapphirina*
- 3b. Scapes glabrous; leaves sharply dentate on distal 1/2 292. *P. flabellifera*
- 2b. Flowers at least 10 mm in diam.; leaf blade usually more than 1 cm.
- 4a. Corolla white or yellow.
- 5a. Corolla white; bracts lanceolate, 2–6 mm 293. *P. eburnea*
- 5b. Corolla yellow; bracts ovate to ovate-oblong, 6–15 mm 135. *P. faberi*
- 4b. Corolla purple or violet.
- 6a. Inflorescences short spicate; corolla tube ca. 2 \times as long as calyx.
- 7a. Spikes compact, flowers contiguous 295. *P. flaccida*
- 7b. Spikes lax, flowers 0.5–1.5(–3) cm apart 296. *P. spicata*
- 6b. Inflorescences capitate; corolla tube nearly as long as calyx.
- 8a. Corolla narrowly campanulate; lobes narrowly oblong, with 2 or 3 linear-triangular lobules 297. *P. cawdoriana*
- 8b. Corolla broadly campanulate or widely funnelform, lobes orbicular to broadly obovate or broadly ovate.
- 9a. Corolla funnelform, lobes emarginate or erose-denticulate at apex 299. *P. sandemaniana*
- 9b. Corolla campanulate, lobes entire 300. *P. wollastonii*

Key 4

- 1a. Leaves pinnately compound or pinnately lobed to midvein.
 - 2a. Plants pubescent 48. *P. filchnerae*
 - 2b. Plants glabrous.
 - 3a. Pinnae (1 or)2–6 pairs, with 2–4 teeth on each side; corolla pink or pale lilac, limb 4–8 mm wide 52. *P. cicutariifolia*
 - 3b. Pinnae 7–9 pairs, pinnatifid or pinnately dentate; corolla white or tinged with lilac, limb 10–12 mm wide 53. *P. merrilliana*
- 1b. Leaves pinnately or palmately lobed, lobes not reaching midvein.
 - 4a. Calyx inflated at base.
 - 5a. Leaf rosette with wiry petioles of withered leaves at base; calyx 8–10 mm in fruit 49. *P. rupestris*
 - 5b. Leaf rosette without remains of old leaves at base; calyx 15–20 mm in fruit 50. *P. sinensis*
 - 4b. Calyx not inflated at base.
 - 6a. Lateral veins of leaves pinnate; calyx many veined.
 - 7a. Capsule ellipsoid, ca. as long as calyx 30. *P. polyneura*
 - 7b. Capsule oblong, slightly longer than calyx 31. *P. saxatilis*
 - 6b. Lateral veins of leaves mostly branched from base; calyx few veined.
 - 8a. Petiole vaginate at base; leaves glabrescent abaxially 33. *P. vaginata*
 - 8b. Petiole not vaginate at base; leaves pubescent along veins abaxially.
 - 9a. Leaf blade palmately lobed 1/3–1/2 its width, lobules with obtuse teeth 34. *P. latisecta*
 - 9b. Leaf blade palmately lobed nearly to base, lobules with acute teeth 35. *P. palmata*

Key 5

- 1a. Calyx lobes leaflike, pubescent on both sides 45. *P. malvacea*
- 1b. Calyx lobes not leaflike, glabrous inside.
 - 2a. Corolla yellow, in compact umbels 14. *P. ambita*
 - 2b. Corolla rose to purple, in lax umbels.
 - 3a. Calyx lobes ovate, deeply emarginate, margin denticulate 15. *P. oreodoxa*
 - 3b. Calyx lobes triangular to ovate-triangular, margin entire.
 - 4a. Leaf blade suborbicular to reniform, as wide as long or nearly so.
 - 5a. Scapes and petioles with tawny long hairs.
 - 6a. Leaves pilose; flowers homostylous or heterostylous 20. *P. obconica*
 - 6b. Leaves strigillose; flowers heterostylous 21. *P. rubifolia*
 - 5b. Scapes and petioles sparsely pubescent or subglabrous; leaves glabrous or nearly so abaxially.
 - 7a. Corolla limb 1.5–2.5 mm wide, lobes at least 5 mm wide 22. *P. sinolisteri*
 - 7b. Corolla limb 5–8 mm wide, lobes 1.5–2 mm wide 23. *P. asarifolia*
 - 4b. Leaf blade ovate to elliptic or oblong, conspicuously longer than wide.
 - 8a. Leaf blade 11–13-lobulate; flowers homostylous 16. *P. dumicola*
 - 8b. Leaf blade sinuate-dentate; flowers heterostylous.
 - 9a. Scapes shorter than leaf rosette, only slightly longer than pedicel 17. *P. barbicalyx*
 - 9b. Scapes longer than leaf rosette, much longer than pedicel.
 - 10a. Leaf blade 0.8–2 cm wide; calyx 2.8–4 mm, parted nearly to middle 18. *P. densa*
 - 10b. Leaf blade at least 3 cm wide; calyx 5–10 mm, parted scarcely to 1/3.
 - 11a. Reticulate veins of leaf blade markedly elevated abaxially; corolla limb 5–8 mm wide 19. *P. vilmoriniana*
 - 11b. Reticulate veins of leaf blade smooth or only slightly raised abaxially; corolla limb 15–25 mm wide 20. *P. obconica*

Key 6

- 1a. Plants with woody rhizomes; capsule valved.
 - 2a. Scapes robust, more than 4 cm; inflorescences many flowered.
 - 3a. Scapes ± yellow farinose toward apex, glabrous 63. *P. bullata*
 - 3b. Scapes with tawny glandular hairs; calyx efarinose except inside near base, pubescent 64. *P. forrestii*
 - 2b. Scapes slender, usually shorter than leaf rosette; inflorescences few flowered.
 - 4a. Leaf blade much longer than wide, base attenuate; petiole ca. as long as leaf blade 65. *P. bracteata*
 - 4b. Leaf blade nearly as long as wide, base truncate to shallowly cordate; petiole distinctly longer

- than leaf blade 66. *P. rockii*
- 1b. Plants with small membranous bud scales at base; capsule crumbling irregularly.
- 5a. Scapes absent.
- 6a. Pedicel densely pilose; calyx 7–9 mm 100. *P. exscapa*
- 6b. Pedicel sparsely pilose; calyx 5–6.5 mm 101. *P. praeflorens*
- 5b. Scapes present.
- 7a. Scape 1(–3)-flowered; bracts usually 2 102. *P. coerulea*
- 7b. Scape (2 or)3- to many flowered; bracts several.
- 8a. Leaf blade oblong-obovate to oblanceolate, base attenuate; petiole very short or nearly obsolete.
- 9a. Flowers homostylous; corolla lobes entire 112. *P. klaveriana*
- 9b. Flowers heterostylous; corolla lobes ± emarginate at apex.
- 10a. Leaf blade neither bullate nor alveolate; corolla lobes cuneate-oblong 115. *P. hylobia*
- 10b. Leaf blade bullate adaxially, alveolate abaxially; corolla lobes broadly obovate.
- 11a. Leaf blade sharply erose-dentate; pedicel hirtellous-pilose 113. *P. davidii*
- 11b. Leaf blade remotely hydathode-denticulate; pedicel pubescent 114. *P. fagosa*
- 8b. Leaf blade oblong to elliptic or broadly obovate, base rounded or short attenuate, distinctly petiolate.
- 12a. Leaf blade irregularly hydathode-dentate; scape arising from leaf rosette of previous year 106. *P. breviscapa*
- 12b. Leaf blade obscurely crenulate or denticulate; scape arising from leaf rosette of current year.
- 13a. Leaves glabrous except for veins pubescent abaxially 107. *P. tardiflora*
- 13b. Leaves pilose or pubescent at least on entire abaxial surface.
- 14a. Leaves thin papery, base subcuneate, not alveolate abaxially 110. *P. leptophylla*
- 14b. Leaves firm papery or subleathery, base rounded or obtuse, prominently alveolate abaxially.
- 15a. Leaves subglabrous adaxially; corolla limb 1.5–2.5 cm wide 108. *P. ovalifolia*
- 15b. Leaves pilose adaxially; corolla limb ca. 1.5 cm wide 109. *P. crassa*

Key 7

- 1a. Leaf blade cordate at base; calyx longer than corolla 51. *P. pycnoloba*
- 1b. Leaf blade attenuate at base; calyx ca. as long as corolla tube 54. *P. veris*

Key 8

- 1a. Leaf blade acute or acuminate at apex.
- 2a. Leaf blade cuneate or rounded at base; calyx ca. 3 mm 55. *P. henryi*
- 2a. Leaf blade cordate at base; calyx 7–10 mm 56. *P. chapaensis*
- 1b. Leaf blade obtuse or rounded at apex.
- 3b. Leaves glabrous; inflorescences abbreviated racemes.
- 4a. Leaf blade oblong to suborbicular or ovate-rounded, 10–15 cm wide, base cordate 57. *P. partschiana*
- 4b. Leaf blade oblong to oblong-obovate, 2–5 cm wide, broadly cuneate to subrounded at base 58. *P. rugosa*
- 3b. Leaves pubescent at least on margin; inflorescences umbellate.
- 5a. Pedicel and calyx glabrous; leaves densely pilose on both surfaces 59. *P. levicalyx*
- 5b. Pedicel and calyx fulvous pilose; leaves pubescent on margin and abaxially.
- 6a. Leaf blade subcordate at base; calyx 4.5–7.5 mm, parted to middle 62. *P. wangii*
- 6b. Leaf blade cuneate or rounded at base.
- 7a. Calyx 3–4 mm, parted to 2/3 60. *P. kweichouensis*
- 7b. Calyx 6–7 mm, parted to 1/3 61. *P. kwangtungensis*

Key 9

- 1a. Some leaf bases attenuate.
- 2a. Flowers usually solitary.
- 3a. Leaf blade 3–4 mm wide, 3-lobed 268. *P. triloba*
- 3b. Leaf blade 4–8 mm wide, incised-dentate 298. *P. klattii*
- 2b. Flowers (2 or)3 to many, in umbels.
- 4a. Corolla lobes entire, tube pilose inside 70. *P. comata*
- 4b. Corolla lobes 3-toothed, tube glabrous inside 71. *P. taliensis*

- 1b. Leaf bases cordate or rounded.
- 5a. Leaf blade suborbicular to reniform, margin obscurely undulate to subentire.
- 6a. Abaxial surface of leaves and inflorescences farinose 10. *P. interjacens*
- 6b. Plants efarinose throughout.
- 7a. Petioles, scapes, abaxial surface of leaves woolly 13. *P. tsiangii*
- 7b. Petioles and scapes with rust-colored multicellular hairs; leaves sparsely pilose.
- 8a. Calyx 3–4 mm, parted to \pm middle 11. *P. cavaleriei*
- 8b. Calyx 7–10 mm, parted to 1/3 12. *P. lithophila*
- 5b. Leaf blade oblong or margin distinctly dentate or lobed.
- 9a. Scapes shorter than leaf rosette; pedicel often ca. as long as scape.
- 10a. Inflorescences and abaxial surface of leaves \pm farinose.
- 11a. Calyx parted below middle, lobes lanceolate to linear-lanceolate; fl. Mar–Apr 1. *P. duclouxii*
- 11b. Calyx parted to middle, lobes triangular to narrowly triangular; fl. Jun–Jul 2. *P. petrocallis*
- 10b. Plants efarinose throughout.
- 12a. Plants sparsely pilose; scapes with small leaves at apex; calyx 2–3 mm 3. *P. divaricata*
- 12b. Plants densely rust-colored pilose, scapes without leaves at apex; calyx ca. 4 mm 4. *P. epilithica*
- 9b. Scapes longer than leaf rosette, many times longer than pedicel.
- 13a. Plants efarinose throughout.
- 14a. Scapes usually with many umbels; corolla tube 4–6 mm 8. *P. malacoides*
- 14b. Scapes with 1 or 2 umbels; corolla tube 8–9 mm 9. *P. pellucida*
- 13b. Plants \pm farinose.
- 15a. Leaves glabrous, copiously white farinose abaxially 5. *P. hypoleuca*
- 15b. Leaves \pm pubescent, efarinose or nearly so.
- 16a. Pin flower style ca. as long as corolla tube; stamens inserted at upper part of corolla tube in thrum flowers 8. *P. malacoides*
- 16b. Pin flower style ca. 1/2 as long as corolla tube; stamens inserted near middle of corolla tube in thrum flowers.
- 17a. Plants biennial, with numerous fibrous roots; corolla tube 4.5–5.5 mm 6. *P. forbesii*
- 17b. Plants perennial, with a short rhizome; corolla tube 7–8 mm 7. *P. effusa*

Key 10

- 1a. Lateral veins of leaves branched from base; calyx few veined.
- 2a. Petiole vaginate at base; leaves glabrescent abaxially 33. *P. vaginata*
- 2b. Petiole not vaginate at base; leaves pubescent along veins abaxially.
- 3a. Flowers homostylous 36. *P. septemloba*
- 3b. Flowers heterostylous.
- 4a. Scapes usually with 2 superimposed umbels; leaf blade coarsely dentate-lobulate 37. *P. loeseneri*
- 4b. Scapes usually with 1 umbel; leaf blade palmately 5–9-lobed.
- 5a. Leaf blade lobed to 2/5, lobules subrotund or broadly triangular with crenate or obtuse teeth 38. *P. heucherifolia*
- 5b. Leaf blade lobed 1/3–1/2, lobules triangular to ovate-triangular with acute teeth.
- 6a. Plants stoloniferous; umbels 2- or 3-flowered 39. *P. alsophila*
- 6b. Plants occasionally producing stolons; umbels usually many flowered 40. *P. geraniifolia*
- 1b. Lateral veins of leaves pinnate; calyx many veined.
- 7a. Leaf blade ovate to oblong, at least 2 \times as long as wide.
- 8a. Leaf blade lobed 1/3–1/2, lobules incised-dentate 31. *P. saxatilis*
- 8b. Leaf blade lobed to 1/4, lobules crenulate 32. *P. sieboldii*
- 7b. Leaf blade suborbicular, slightly longer than wide.
- 9a. Leaf blade distinctly palmately or pinnately lobed.
- 10a. Calyx and corolla tube pubescent to glabrous 30. *P. polyneura*
- 10b. Calyx and corolla tube subglabrous 31. *P. saxatilis*
- 9b. Leaf blade shallowly crenate or dentate-lobulate.
- 11a. Scapes with 3–10 superimposed umbels; calyx parted to middle.
- 12a. Calyx 8–11 mm, lobes ovate to ovate-lanceolate 25. *P. mollis*
- 12b. Calyx 5–6.5 mm, lobes narrowly lanceolate 26. *P. sinomollis*
- 11b. Scapes with 1 or 2 superimposed umbels; calyx parted usually below middle.
- 13a. Calyx lobes oblong to oblong-lanceolate, herbaceous, ciliate 27. *P. neurocalyx*
- 13b. Calyx lobes lanceolate, subleathery, sparsely pubescent or glabrescent.

- 14a. Leaf blade sinuate, lobules subrotund; calyx 4.5–7 mm; corolla tube 6.5–8 mm 28. *P. cinerascens*
- 14b. Leaf blade coarsely dentate-lobulate, lobules triangular, apex acute; calyx 7–12 mm; corolla tube 10–13.5 mm 29. *P. violaris*

Key 11

- 1a. Flowers homostylous; leaf rosettes 1–2 cm tall 260. *P. homogama*
- 1b. Flowers heterostylous; leaf rosettes more than 2 cm tall.
 - 2a. Corolla lobes entire 261. *P. humilis*
 - 2b. Corolla lobes distinctly emarginate to 2-lobed.
 - 3a. Leaf blade oblanceolate to obovate or spatulate, attenuate at base.
 - 4a. Inflorescences compact; pedicel 1–5 mm; calyx lobes ovate to ovate-oblong 262. *P. aliciae*
 - 4b. Inflorescences lax; pedicel usually more than 5 mm; calyx lobes lanceolate to narrowly oblong 263. *P. rupicola*
 - 3b. Leaf blade broadly ovate to oblong, base shallowly cordate to truncate or very short attenuate.
 - 5a. Calyx parted to middle or above; leaf blade irregularly crenate 264. *P. souliei*
 - 5b. Calyx parted below middle; leaf blade deeply incised to pinnatifid 265. *P. blinii*

Key 12

- 1a. Corolla campanulate, exannulate.
 - 2a. Corolla rose-lavender or rose-purple; calyx lobes oblong-lanceolate to lanceolate, apex subacute; capsule ca. 2 × as long as calyx 187. *P. boreiocalliantha*
 - 2b. Corolla yellow or white; calyx lobes oblong, apex rounded or obtuse; capsule usually ca. as long as calyx.
 - 3a. Leaf blade lacinate-dentate 188. *P. agleniana*
 - 3b. Leaf blade regularly serrate or crenulate.
 - 4a. Scapes robust, 5- or 6-flowered 189. *P. obliqua*
 - 4b. Scapes slender, 1- or 2-flowered.
 - 5a. Leaf blade linear-lanceolate, 5–10 mm wide, base attenuate 190. *P. falcifolia*
 - 5b. Leaf blade ovate to ovate-lanceolate, 15–25 mm wide, base cordate to rounded or cuneate 191. *P. elizabethae*
- 1b. Corolla funnelform, usually annulate.
 - 6a. Calyx campanulate; corolla lobes dentate or lobed; capsule globose, submembranous, crumbled irregularly.
 - 7a. Corolla yellow.
 - 8a. Leaf blade attenuate at base.
 - 9a. Leaf blade crenate to denticulate; calyx lobes ovate to ovate-oblong, apex obtuse 86. *P. strumosa*
 - 9b. Leaf blade coarsely dentate or pinnatifid; calyx lobes ovate to lanceolate, apex acute or dentate.
 - 10a. Leaf blade incised to pinnately lobed; pin flower style exerted from corolla tube 87. *P. chionata*
 - 10b. Leaf blade irregularly coarse dentate; pin flower style slightly exerted 88. *P. chionogenes*
 - 8b. Leaf blade rounded to cordate or short decurrent at base.
 - 11a. Leaves efarinose, with scattered minute reddish brown or blackish glands abaxially 85. *P. calthifolia*
 - 11b. Leaves densely yellow farinose abaxially.
 - 12a. Calyx 9–10 mm, parted to 2/3 83. *P. jucunda*
 - 12b. Calyx 5–7.5 mm, parted to middle.
 - 13a. Scapes 3–10 cm, usually shorter than leaf rosette; pin flower style ca. as long as corolla tube 84. *P. hilaris*
 - 13b. Scapes 7–18(–35) cm, longer than leaf rosette; pin flower style exerted from corolla tube 86. *P. strumosa*
 - 7b. Corolla lilac, rose-purple, or white.
 - 14a. At least some leaf blades cordate to truncate at base.
 - 15a. Leaf blade obtuse at apex, regularly crenulate; calyx efarinose, glandular 91. *P. tsariensis*
 - 15b. Leaf blade acute at apex, acutely dentate; calyx ± farinose.
 - 16a. Calyx parted to 1/3, lobes triangular to subrectangular 89. *P. griffithii*
 - 16b. Calyx parted below middle, lobes lanceolate 90. *P. tanneri*
 - 14b. Leaf blade attenuate at base.
 - 17a. Pedicel 1–3 mm.

- 18a. Flowers homostylous; stamens inserted at middle of corolla tube 98. *P. hookeri*
- 18b. Flowers heterostylous; stamens in thrum flowers inserted toward apex of corolla tube 99. *P. bomiensis*
- 17b. Pedicel at least 5 mm.
- 19a. Corolla lobes crenate or entire.
- 20a. Leaf blade irregularly lobulate to pinnatifid, lobules denticulate; calyx parted to 1/3 96. *P. sonchifolia*
- 20b. Leaf blade erose-denticulate; calyx parted to middle 97. *P. whitei*
- 19b. Corolla lobes emarginate.
- 21a. Leaf blade pinnately incised or lobed; calyx lobes entire or dentate 87. *P. chionata*
- 21b. Leaf blade crenulate or dentate; calyx lobes entire.
- 22a. Plants farinose; pin flower style exerted from corolla tube 92. *P. calderiana*
- 22b. Plants efarinose; pin flower style reaching upper 1/2 of corolla tube.
- 23a. Corolla exannulate, tube pilose inside 95. *P. tongolensis*
- 23b. Corolla annulate, tube glabrous inside.
- 24a. Scapes with a solitary flower; corolla limb to 3.5 cm wide 93. *P. chamaedoron*
- 24b. Scapes with 5–15 flowers; corolla limb 2–3 cm wide 94. *P. chamaethauma*
- 6b. Calyx tubular or narrowly campanulate; corolla lobes entire (lobed or dentate in *P. calliantha*, *P. elongata*, *P. farreriana*, *P. macrophylla*, *P. megalocarpa*); capsule oblong, opening by short teeth.
- 25a. Corolla yellow.
- 26a. Corolla lobes emarginate at apex 173. *P. calliantha*
- 26b. Corolla lobes entire or crenate.
- 27a. Plants dwarf, scapes less than 10 cm; leaf blade linear-lanceolate, white farinose 175. *P. crocifolia*
- 27b. Plants more robust, scapes to 20 cm; leaf blade not as above.
- 28a. Calyx lobes lanceolate to sublinear; corolla lobes with 4–6 teeth at apex 176. *P. elongata*
- 28b. Calyx lobes elliptic to oblong-lanceolate or lanceolate; corolla lobes entire 177. *P. orbicularis*
- 25b. Corolla lilac or violet.
- 29a. Corolla lobes deeply emarginate at apex.
- 30a. Plants white farinose; calyx lobes lanceolate, apex acute.
- 31a. Bracts leaflike; leaf blade lanceolate to oblanceolate, entire to denticulate 165. *P. macrophylla*
- 31b. Bracts not leaflike; leaf blade elliptic to oblong-elliptic, distinctly denticulate 171. *P. farreriana*
- 30b. Plants yellow farinose; calyx lobes oblong, apex acute to subobtuse.
- 32a. Leaf blade lanceolate to linear-lanceolate, finely denticulate, apex acute to subobtuse; calyx lobes oblong-oblanceolate; capsules 1.5–3 cm 172. *P. megalocarpa*
- 32b. Leaf blade narrowly ovate to obovate-oblong or oblanceolate, crenulate, apex rounded to obtuse; calyx lobes narrowly oblong; capsules 1–1.3 cm 173. *P. calliantha*
- 29b. Corolla lobes entire.
- 33a. Leaves efarinose at anthesis.
- 34a. Leaf blade elliptic to oblong-ovate or oblong-lanceolate, ± regularly blunt denticulate 159. *P. nivalis*
- 34b. Leaf blade lanceolate to oblanceolate, subentire or obscurely denticulate.
- 35a. Corolla limb 1–1.3 cm in diam., lobes puberulent on both sides 160. *P. melanantha*
- 35b. Corolla limb 1.6–3 cm in diam., lobes glabrous.
- 36a. Corolla lobes lanceolate to narrowly oblong, paler in color than tube 161. *P. woodwardii*
- 36b. Corolla lobes oblong, same color as or darker than tube 162. *P. purdomii*
- 33b. Leaves conspicuously farinose at anthesis.
- 37a. Farina yellow.
- 38a. Calyx parted to base, lobes lanceolate 168. *P. ninguida*
- 38b. Calyx parted to 2/3, lobes narrowly oblong to lanceolate.
- 39a. Farina bright yellow; pin flower style or thrum flower stamens reaching mouth of corolla tube 169. *P. chionantha*
- 39b. Farina pale yellow; pin flower style or thrum flower stamens reaching middle of corolla tube.
- 40a. Calyx lobes oblong to lanceolate, apex subacute; corolla lobes oblong-elliptic 170. *P. sinoplantaginea*

- 40b. Calyx lobes lanceolate to oblong, apex subobtuse; corolla lobes suborbicular to obovate 165. *P. macrophylla*
- 37b. Farina white.
- 41a. Calyx parted to near middle.
- 42a. Leaf blade elliptic to oblong-ovate or oblong-lanceolate, ± regularly denticulate 159. *P. nivalis*
- 42b. Leaf blade lanceolate to oblanceolate, entire or obscurely denticulate.
- 43a. Pin flower style or thrum flower stamens reaching mouth of corolla tube 163. *P. melanops*
- 43b. Pin flower style or thrum flower stamens slightly longer than calyx 162. *P. purdomii*
- 41b. Calyx parted below middle.
- 44a. Leaf blade linear, 2–4(–6) mm wide 164. *P. graminifolia*
- 44b. Leaf blade not linear, at least 1 cm wide.
- 45a. Leaf blade lanceolate to oblanceolate, apex acute to obtuse; capsules longer than calyx 165. *P. macrophylla*
- 45b. Leaf blade (at least of outer leaves) elliptic to oblong, apex subrounded; capsules ca. as long as calyx.
- 46a. Calyx parted to base, lobes spreading, lanceolate 166. *P. youngeriana*
- 46b. Calyx parted to 2/3–3/4, lobes erect, oblong-lanceolate 167. *P. russeola*

Key 13

- 1a. Plants efarinose.
- 2a. Corolla 4–7 mm in diam.; leaves not cartilaginous on margin.
- 3a. Scapes glandular; leaf blade coarsely pinnatifid-dentate with obtuse teeth 291. *P. sapphirina*
- 3b. Scapes without glands; leaf blade sharply dentate on upper 1/2 of margin 292. *P. flabellifera*
- 2b. Corolla more than 1 cm in diam.; leaves cartilaginous on margin.
- 4a. Umbels compact; pedicel 1–2 mm, concealed in bracts 135. *P. faberi*
- 4b. Umbels lax; pedicel usually more than 3 mm, distinctly longer than bracts.
- 5a. Leaf blade coarse dentate 137. *P. odontica*
- 5b. Leaf blade denticulate or subentire.
- 6a. Leaf blade lanceolate to elliptic-lanceolate, apex acute; corolla lobes narrowly oblong 138. *P. virginis*
- 6b. Leaf blade obovate to oblanceolate; corolla lobes suborbicular to elliptic.
- 7a. Leaf blade rounded or obtuse at apex.
- 8a. Plants delicate; corolla 0.8–1.2 cm 139. *P. silaensis*
- 8b. Plants robust; corolla 1.2–1.6 cm 140. *P. amethystina*
- 7b. Leaf blade acute at apex.
- 9a. Calyx 3.5–5 mm; corolla broadly campanulate, pubescent inside 141. *P. valentiniana*
- 9b. Calyx 6–8 mm; corolla narrowly campanulate, glabrous inside 142. *P. kingii*
- 1b. Plants farinose, sometimes only sparsely so on calyx.
- 10a. Plants dwarf, less than 5 cm tall 227. *P. mutantiflora*
- 10b. Plants robust, more than 5 cm tall.
- 11a. Corolla red to purple.
- 12a. Leaf blade rounded to truncate at base 145. *P. alpicola*
- 12b. Leaf blade attenuate at base.
- 13a. Calyx with vertical stripes of farina 116. *P. secundiflora*
- 13b. Calyx without vertical stripes of farina.
- 14a. Corolla limb 0.6–1.3(–1.8) cm wide, shorter than tube; leaf blade erose-dentate 149. *P. waltonii*
- 14b. Corolla limb 2–2.5 cm wide, longer than tube; leaf blade incised-dentate 150. *P. ioessa*
- 11b. Corolla yellow or white.
- 15a. Leaf blade attenuate at base.
- 16a. Leaves thin papery or submembranous, reticulate veins prominent abaxially 143. *P. sikkimensis*
- 16b. Leaves firm papery or subleathery, reticulate veins obscure abaxially 144. *P. chumbiensis*
- 15b. Leaf blade cordate, truncate, or rounded at base.
- 17a. Leaf blade broadly ovate to ovate-oblong or suborbicular, slightly longer than wide or nearly as long as wide.
- 18a. Scapes slender, 10–40 cm; umbels 2–8-flowered 147. *P. firmipes*

- 18b. Scapes robust, 30–120 cm; umbels (10–)15–30(–80)-flowered 148. *P. florindae*
- 17b. Leaf blade elliptic to oblong, usually at least 2 × as long as wide.
 - 19a. Bracts linear-lanceolate to subulate; calyx parted to near middle; leaves firmly papery or subleathery 144. *P. chumbiensis*
 - 19b. Bracts lanceolate to ovate; calyx usually parted to 1/3; leaves thinly papery or submembranous.
 - 20a. Calyx campanulate to tubular-campanulate, lobes triangular to triangular-lanceolate; stamens in pin flowers inserted near base of corolla tube 145. *P. alpicola*
 - 20b. Calyx tubular-campanulate, lobes lanceolate; stamens in pin flowers inserted at middle of corolla tube 146. *P. reticulata*

Key 14

- 1a. Plants with woody rhizomes; leaf blade usually less than 1.3 cm wide, evergreen.
 - 2a. Leaves farinose abaxially; corolla throat without projecting tuft of hairs 266. *P. dryadifolia*
 - 2b. Leaves efarinose; corolla throat with projecting tuft of hairs 267. *P. tsongpenii*
- 1b. Plants without woody rhizomes; leaf blade usually more than 2 cm wide, withering in winter.
 - 3a. Plants farinose.
 - 4a. Corolla yellow 215. *P. qinghaiensis*
 - 4b. Corolla lilac or violet.
 - 5a. Corolla lobes deeply emarginate.
 - 6a. Calyx broadly campanulate, obscurely veined, efarinose or farinose at base 217. *P. tenuipes*
 - 6b. Calyx subtubular, distinctly 5-veined, farinose on both sides 194. *P. baileyana*
 - 5b. Corolla lobes entire or crenulate.
 - 7a. Lateral veins of leaves subpinnate; farina yellow; capsule at least 1.5 × as long as calyx 195. *P. rotundifolia*
 - 7b. Lateral veins of leaves subbasal; farina white, capsule slightly shorter than calyx 193. *P. littledalei*
 - 3b. Plants efarinose.
 - 8a. Leaves papery or subleathery; calyx lobes subobtusate at apex.
 - 9a. Corolla lobes emarginate at apex, lobules entire 67. *P. chartacea*
 - 9b. Corolla lobes 2-cleft at apex, lobules dentate or lacerate.
 - 10a. Umbels with bracts and small petiolate leaves; corolla tube 1.1–1.3 cm, pilose inside 68. *P. lacerata*
 - 10b. Umbels with simple bracts only; corolla tube 0.7–1(–1.2) cm, puberulent inside 69. *P. veitchiana*
 - 8b. Leaves herbaceous or membranous; calyx lobes acute at apex.
 - 11a. Corolla yellow, lobes strongly reflexed 185. *P. tzetsouensis*
 - 11b. Corolla lilac or violet, lobes spreading.
 - 12a. Leaf blade ovate to suborbicular, margin distinctly dentate 196. *P. gambeliana*
 - 12b. Leaf blade elliptic to obovate-oblong, margin obscurely blunt dentate 105. *P. chienii*

Key 15

- 1a. Leaf blade pinnately lobulate.
 - 2a. Corolla rose to purple; leaf blade lobed to near midvein 151. *P. lungchiensis*
 - 2b. Corolla white; leaf blade lobed to 1/4 152. *P. lactucoides*
- 1b. Leaf blade entire or denticulate.
 - 3a. Corolla yellow.
 - 4a. Corolla lobes linear, 1–2 mm wide 182. *P. tangutica*
 - 4b. Corolla lobes oblong to suborbicular, 3–6 mm wide.
 - 5a. Plants glandular puberulent; leaf blade 2–2.5 cm 174. *P. cerina*
 - 5b. Plants glabrous; leaf blade much more than 2.5 cm.
 - 6a. Leaf blade short attenuate at base, shorter than petiole 186. *P. handeliana*
 - 6b. Leaf blade long attenuate at base, longer than petiole.
 - 7a. Corolla lobes broadly elliptic to suborbicular, 6–8 mm wide.
 - 8a. Scapes with 2 umbels; pedicel puberulent 178. *P. reflexa*
 - 8b. Scapes with 1 umbel; pedicel glabrous 179. *P. soongii*
 - 7b. Corolla lobes oblong, 3–5 mm wide.
 - 9a. Corolla lobes strongly reflexed, lying against tube 183. *P. szechuanica*
 - 9b. Corolla lobes ± spreading, not lying against tube.
 - 10a. Plants efarinose; corolla pale yellow 184. *P. aemula*

- 10b. Plants ± farinose; corolla purplish or yellow 181. *P. advena*
- 3b. Corolla rose-purple or lilac, rarely white.
- 11a. Corolla lobes narrowly oblong to linear.
- 12a. Corolla lobes linear, 1–2 mm wide 182. *P. tangutica*
- 12b. Corolla lobes oblong, 2.5–3 mm wide.
- 13a. Calyx parted to 1/3 180. *P. maximowiczii*
- 13b. Calyx parted to middle 181. *P. advena*
- 11b. Corolla lobes elliptic to oblong.
- 14a. Pin flower style or thrum stamens reaching mouth of corolla tube.
- 15a. Leaf blade elliptic to oblong-elliptic, base short attenuate 158. *P. hoi*
- 15b. Leaf blade obovate to oblanceolate or spatulate, base long attenuate.
- 16a. Calyx parted to middle or slightly below, lobes oblong-lanceolate, pedicel
farinose 156. *P. optata*
- 16b. Calyx parted to below middle, lobes lanceolate, pedicel efarinose 157. *P. limbata*
- 14b. Pin flower style or thrum stamens reaching middle of corolla tube, slightly longer than
calyx.
- 17a. Leaf blade ovate, obtuse to subrounded at base; petiole 2–3 × as long as
blade 153. *P. woonyoungiana*
- 17b. Leaf blade obovate to spatulate, tapering at base; petiole seldom ca. 2 × as
long as leaf blade.
- 18a. Leaf rosette at least 10 cm tall, base with few triangular bud scales; leaves
efarinose or nearly so at anthesis 156. *P. optata*
- 18b. Leaf rosette 2–8 cm tall, without basal bud scales but with old curling petioles;
leaves conspicuously farinose at anthesis.
- 19a. Outer leaves oblong-spatulate to lanceolate, inner leaves narrowly
oblanceolate; corolla tube ca. 1.5 × as long as calyx 154. *P. diantha*
- 19b. Leaves spatulate to oblong-spatulate or oblanceolate; corolla tube at
least 2 × as long as calyx..... 155. *P. minor*

Key 16

- 1a. Leaves papery to subleathery, ± bullate adaxially.
- 2a. Scapes less than 1 cm at anthesis 103. *P. esquirolii*
- 2b. Scapes at least 3.5 cm at anthesis.
- 3a. Calyx parted to middle, lobes entire 111. *P. epilosa*
- 3b. Calyx parted to ca. 1/3, lobes 3-toothed 104. *P. tridentifera*
- 1b. Leaves membranous, not bullate.
- 4a. Scapes absent.
- 5a. Corolla lobes 3-toothed; inner leaves with long slender petioles 72. *P. gracilipes*
- 5b. Corolla lobes emarginate, lobules entire; leaves with broadly winged petioles.
- 6a. Plants ± farinose; calyx tubular-campanulate, 4–6 mm, lobes acute to subacuminate 73. *P. cunninghamii*
- 6b. Plants efarinose; calyx tubular, 7–12 mm, lobes acuminate-subulate, ± recurved at apex 74. *P. hoffmanniana*
- 4b. Scapes present.
- 7a. Leaves distinctly dimorphic, base attenuate in outer leaves or truncate to cordate in inner leaves.
- 8a. Corolla lobes deeply emarginate; calyx lobes acute to obtuse 78. *P. moupinensis*
- 8b. Corolla lobes 2- to several toothed; calyx lobes acuminate.
- 9a. Calyx lobes ovate-triangular, acuminate-subulate 75. *P. scapigera*
- 9b. Calyx lobes ovate to ovate-oblong, subacuminate 76. *P. bracteosa*
- 7b. Leaves monomorphic, base attenuate, rarely subrounded.
- 10a. Plants ± farinose.
- 11a. Scapes obsolete; corolla lobes 2-cleft, lobules irregularly denticulate 77. *P. prevernalis*
- 11b. Scapes more than 2 cm at anthesis; corolla lobes deeply emarginate, lobules entire 78. *P. moupinensis*
- 10b. Plants efarinose.
- 12a. Petiole slender, ca. as long as leaf blade in flowering plants.
- 13a. Leaf blade irregularly sinuate-dentate; calyx lobes obtuse 81. *P. sinuata*
- 13b. Leaf blade dentate; calyx lobes acute 82. *P. wenshanensis*
- 12b. Petioles broadly winged, obsolete to 1/2 as long as blade in flowering plants.
- 14a. Corolla exannulate; stamens of pin flowers inserted at lower 1/2 of corolla

- tube; thrum flower style ca. 1/2 as long as calyx 80. *P. euosma*
- 14b. Corolla annulate; stamens of pin flowers inserted at middle of corolla tube; thrum flower style ca. as long as calyx.
- 15a. Bracts triangular to ovate-triangular; umbels (2-)4- to many flowered; scapes robust 78. *P. moupinensis*
- 15b. Bracts linear-lanceolate; umbels (1-)3-8-flowered; scapes slender 79. *P. odontocalyx*

Key 17

- 1a. Corolla rose to purple or, if white, flowers heterostylous.
- 2a. Plants farinose at least inside of calyx.
- 3a. Corolla tube gradually widened from base; calyx yellow farinose inside 117. *P. miyabeana*
- 3b. Corolla tube cylindric, widened near mouth; calyx farinose on both sides.
- 4a. Leaf blade elliptic to elliptic-oblancheolate; lateral veins nearly at right angles to midvein, corolla eye red or purple 118. *P. pulverulenta*
- 4b. Leaf blade narrowly oblong-oblancheolate to obovate- oblancheolate; lateral veins at acute angles to midvein; corolla eye yellow 119. *P. beesiana*
- 2b. Plants efarinose throughout.
- 5a. Calyx parted at least to middle, lobes lanceolate.
- 6a. Calyx 5-6 mm; leaf blade oblancheolate to obovate-elliptic, ± regularly denticulate 120. *P. stenodonta*
- 6b. Calyx 10-14 mm; leaf blade oblong to obovate-oblong, erose-denticulate 121. *P. mallophylla*
- 5b. Calyx parted scarcely to middle, lobes triangular.
- 7a. Corolla dark purple when young, limb 1-1.5 cm wide, lobes 3-4(-5) mm 122. *P. anisodora*
- 7b. Corolla red to pale purple, limb usually more than 1.5 cm wide, lobes usually more than 5 mm.
- 8a. Corolla lobes oblong, emarginate, crenate-serrate at apex 117. *P. miyabeana*
- 8b. Corolla lobes broadly obovate to suborbicular, emarginate to 2-cleft at apex.
- 9a. Corolla limb 1-1.5 cm wide, lobes ca. 1/2 as long as tube; plants aromatic when live 123. *P. wilsonii*
- 9b. Corolla limb 1.8-3 cm wide, lobes slightly shorter than tube; plants not aromatic 124. *P. poissonii*
- 1b. Corolla yellow or orange or, if white, flowers homostylous.
- 10a. Scapes and inflorescences farinose.
- 11a. Calyx lobes lanceolate 125. *P. bulleyana*
- 11b. Calyx lobes triangular.
- 12a. Corolla yellow; flowers heterostylous.
- 13a. Corolla tube 0.8-1.1 cm, ca. 2 × as long as calyx, limb 1-1.5 cm wide 126. *P. smithiana*
- 13b. Corolla tube 1.2-1.8 cm, ca. 3 × as long as calyx, limb ca. 2.5 cm wide 127. *P. helodoxa*
- 12b. Corolla orange; flowers homostylous or heterostylous.
- 14a. Corolla orange or tinged with red; leaf blade subrounded to broadly cuneate at base; petiole distinct 128. *P. cockburniana*
- 14b. Corolla pale orange; leaf blade cuneate-attenuate at base; petiole usually indistinct 129. *P. chungensis*
- 10b. Plants completely efarinose.
- 15a. Calyx tubular-campanulate, parted below middle, lobes lanceolate 130. *P. aurantiaca*
- 15b. Calyx campanulate, parted scarcely to middle, lobes triangular.
- 16a. Flowers homostylous; corolla limb 0.6-1(-1.2) cm wide 131. *P. prenantha*
- 16b. Flowers heterostylous; corolla limb usually more than 1.2 cm wide.
- 17a. Scapes with 3 or 4 superimposed umbels; corolla tube cylindric, enlarged near mouth 132. *P. chrysochlora*
- 17b. Scapes with 1-3 superimposed umbels; corolla tube gradually amplified upward from base.
- 18a. Leaf blade 3-5 cm, margin densely fine denticulate; pin flower style or thrum flower stamens slightly exceeding middle of corolla tube 133. *P. melanodonta*
- 18b. Leaf blade 6-12 cm, margin denticulate; pin flower style or thrum flower stamens exerted from corolla tube 134. *P. serratifolia*

Key 18

- 1a. Corolla throat with a projecting tuft of hairs.
- 2a. Leaves scabrous, with short hairs or glands.

- 3a. Bracts ovate to linear-lanceolate; corolla tube pubescent outside 255. *P. primulina*
 3b. Bracts broadly ovate; corolla tube glabrous outside 256. *P. occlusa*
- 2b. Leaves glabrous and smooth.
- 4a. Corolla throat with a purple tuft of hairs 257. *P. barbatula*
 4b. Corolla throat with a white tuft of hairs.
- 5a. Plants yellow farinose or efarinose; stolons very short or absent 258. *P. bella*
 5b. Plants white farinose; stolons flagellate 259. *P. moschophora*
- 1b. Corolla throat without a projecting tuft of hairs.
- 6a. Plants completely efarinose; leaves entire except sometimes remotely dentate in *P. dickieana*, or bracts auriculate at base.
- 7a. Leaf blade linear to subulate, ca. 1 mm wide, sessile or nearly so 243. *P. subularia*
 7b. Leaf blade not linear, more than 1 mm wide, petiolate.
- 8a. Bracts much shorter than calyx.
- 9a. Plants 1–3 cm high; scapes shorter than leaf rosette; corolla 4–7 mm in diam.
- 10a. Leaf blade spatulate to oblanceolate, 5–12 × 1–2 mm; calyx 2–2.5 mm, not veined 244. *P. praetermissa*
 10b. Leaf blade elliptic to obovate-elliptic or subrhomboid, 3–15 × 2–5 mm; calyx ca. 4 mm, 5-veined 236. *P. pumilio*
- 9b. Plants usually more than 4 cm high; scapes longer than leaf rosette; corolla 20–25 mm in diam.
- 11a. Leaf blade broadly ovate to ovate-lanceolate; scape 1-flowered; bracts reduced, scalelike; corolla lavender blue to purplish 237. *P. oxygraphidifolia*
 11b. Leaf blade elliptic-obovate to oblanceolate; umbel 1–6-flowered; bracts linear; corolla yellow, white, or purple 136. *P. dickieana*
- 8b. Bracts at least as long as calyx.
- 12a. Bracts linear, not auriculate at base 239. *P. fasciculata*
 12b. Bracts oblong, auriculate at base.
- 13a. Auricles of bracts 4–7 mm 240. *P. involucrata*
 13b. Auricles of bracts 1–1.5 mm.
- 14a. Calyx densely glandular ciliolate on margin; scapes longer than pedicel 241. *P. nutans*
 14b. Calyx glabrous on margin; scapes often shorter than pedicel 242. *P. tibetica*
- 6b. Plants conspicuously farinose or leaves distinctly dentate or lobed.
- 15a. Flowering scapes 1–3(–5) cm, 1- or 2-, rarely few flowered.
- 16a. Leaves efarinose.
- 17a. Leaves densely short glandular pubescent and minutely glandular, scabrous.
- 18a. Scapes shorter than leaf rosette; calyx tubular, glandular pubescent 250. *P. walshii*
 18b. Scapes longer than leaf rosette; calyx campanulate, short-stalked glandular.
- 19a. Flowers homostylous; corolla limb ca. 8 mm wide 248. *P. annulata*
 19b. Flowers heterostylous; corolla limb ca. 15 mm wide 249. *P. rubicunda*
- 17b. Leaves glabrous, rarely sparsely puberulent.
- 20a. Leaf blade pinnately 5–11-lobed 238. *P. urticifolia*
 20b. Leaf blade dentate or incised-lobulate.
- 21a. Corolla tube ca. 5 mm; leaf blade oblong-cuneate to obovate, leaf apex subtruncate, with 3–7 sharp teeth 245. *P. muscoides*
 21b. Corolla tube 8–10 mm; leaf blade spatulate, apex rounded.
- 22a. Leaves minutely glandular, margin dentate near apex; corolla tube glabrous outside 246. *P. waddellii*
 22b. Leaves glabrous, margin dentate from base to apex; corolla tube pubescent outside 247. *P. tenuiloba*
- 16b. Leaves conspicuously farinose.
- 23a. Corolla tube ca. as long as to slightly longer than calyx.
- 24a. Calyx parted nearly to middle; lobes linear, ovate-triangular, or lanceolate.
- 25a. Leaf blade entire or crenulate above middle; calyx 3–5 mm, lobes lanceolate to broadly linear 200. *P. concinna*
 25b. Leaf blade denticulate to dentate; calyx 5–7 mm, lobes ovate-triangular 201. *P. rhodochroa*
- 24b. Calyx parted below middle; lobes lanceolate.
- 26a. Leaves densely glandular puberulent adaxially, white farinose abaxially;

- corolla lobes entire to erose-crenulate 192. *P. caveana*
- 26b. Leaves glabrous; corolla lobes emarginate.
- 27a. Flowers homostylous; leaves white farinose 202. *P. meiotera*
- 27b. Flowers heterostylous; leaves yellow farinose 230. *P. kialensis*
- 23b. Corolla tube 2–3 × as long as calyx.
- 28a. Flowers subsessile; bracts inserted immediately below calyx.
- 29a. Farina white; corolla limb to 2.5 cm wide 251. *P. tenella*
- 29b. Farina yellow; corolla limb to 1 cm wide 254. *P. minutissima*
- 28b. Flowers conspicuously pedicellate; bracts inserted at base of pedicel.
- 30a. Scapes obsolete; bracts 1 229. *P. socialis*
- 30b. Scapes well developed; bracts 2 to many.
- 31a. Farina white or light cream-yellow.
- 32a. Flowers homostylous; calyx 8–10 mm, parted to middle or slightly below 221. *P. clutterbuckii*
- 32b. Flowers heterostylous; calyx 6.5–7 mm, parted to below middle 253. *P. candicans*
- 31b. Farina bright yellow.
- 33a. Corolla tube 3–4 × as long as calyx; leaf blade membranous 228. *P. membranifolia*
- 33b. Corolla tube ca. 2 × as long as calyx; leaf blade not membranous.
- 34a. Scapes 1–1.5 × as long as pedicel 230. *P. kialensis*
- 34b. Scapes at least 3 × as long as pedicel.
- 35a. Calyx 5-veined, parted to ± middle 231. *P. yunnanensis*
- 35b. Calyx not veined, parted to below middle 252. *P. rimicola*
- 15b. Flowering scapes usually more than 5 cm, 3- to many flowered.
- 36a. Corolla tube ca. as long as to slightly longer than calyx.
- 37a. Plants conspicuously farinose.
- 38a. Bracts reflexed after anthesis 203. *P. algida*
- 38b. Bracts suberect, not reflexed.
- 39a. Calyx 5-veined, nearly efarinose.
- 40a. Calyx campanulate, 4–6 mm, lobes ovate-oblong to triangular 204. *P. farinosa*
- 40b. Calyx tubular, 6–10 mm, lobes oblong to lanceolate 205. *P. stenocalyx*
- 39b. Calyx smooth, ± white farinose.
- 41a. Leaves white farinose; calyx ca. 4.5 mm, lobes lanceolate; plants stoloniferous 206. *P. caldaria*
- 41b. Leaves efarinose; calyx 6–7.5 mm, lobes oblong; plants without stolons 207. *P. fangingensis*
- 37b. Plants efarinose or nearly so.
- 42a. Bracts reflexed after anthesis 203. *P. algida*
- 42b. Bracts suberect, not reflexed.
- 43a. Calyx 5-veined.
- 44a. Calyx campanulate, 4–6 mm, lobes triangular 204. *P. farinosa*
- 44b. Calyx tubular, 6–10 mm, lobes oblong to lanceolate 205. *P. stenocalyx*
- 43b. Calyx without veins.
- 45a. Calyx lobes triangular or lanceolate, apex acute.
- 46a. Umbels (1 or) 2–8-flowered; bracts 1.5–2 mm 210. *P. erratica*
- 46b. Umbels 10- to many flowered; bracts 3–10 mm.
- 47a. Bracts oblong-ovate; scapes fistular, constricted below inflorescences 208. *P. fistulosa*
- 47b. Bracts lanceolate; scapes neither fistular nor constricted below inflorescences 209. *P. longiscapa*
- 45b. Calyx lobes oblong, apex obtuse or rounded.
- 48a. Calyx tubular to tubular-campanulate, parted to 1/3; bracts slightly saccate at base 211. *P. efarinosa*
- 48b. Calyx campanulate, parted to middle or below; bracts not saccate at base.
- 49a. Leaves membranous when dry, puberulent

- adaxially 212. *P. huashanensis*
- 49b. Leaves papery when dry, glabrous, sometimes sparsely glandular.
- 50a. Pedicel and calyx smooth; leaf blade ovate to oblong, not well developed in flowering plants 213. *P. obsessa*
- 50b. Pedicel and calyx minutely glandular; leaf blade oblanceolate, well developed in flowering plants 214. *P. sertulum*
- 36b. Corolla tube 2–3 × as long as calyx.
- 51a. Corolla yellow.
- 52a. Leaf blade spatulate to linear-lanceolate or linear-oblanceolate; farina bright yellow 226. *P. prattii*
- 52b. Leaf blade broadly ovate to elliptic or suborbicular; farina white 216. *P. flava*
- 51b. Corolla rose-purple or violet.
- 53a. Calyx tubular, 6–12 mm, 5-veined.
- 54a. Leaf blade subentire, crenulate, to dentate; pin flower style ca. as long as calyx, thrum flower style 2–3 mm 205. *P. stenocalyx*
- 54b. Leaf blade irregularly dentate; pin flower style ca. as long as corolla tube, thrum flower style slightly shorter than calyx 218. *P. jaffreyana*
- 53b. Calyx campanulate, 4–6 mm or, if more than 7 mm, without veins.
- 55a. Leaves efarinose.
- 56a. Leaf blade pinnatifid-incised, lobules dentate 235. *P. laciniata*
- 56b. Leaf blade denticulate.
- 57a. Calyx 3.5–5.5 mm; corolla limb 1–1.5 cm wide 233. *P. conspersa*
- 57b. Calyx (5–)6–10 mm; corolla limb 1.5–2.5 cm wide 234. *P. gemmifera*
- 55b. Leaves conspicuously farinose.
- 58a. Calyx usually parted to 1/3; leaves yellow farinose.
- 59a. Corolla tube 10–13 mm; pin flower style reaching middle of tube 219. *P. fernaldiana*
- 59b. Corolla tube 8–10 mm; pin flower style ca. as long as tube 220. *P. fangii*
- 58b. Calyx parted to middle or below.
- 60a. Leaves white farinose or light cream-yellow farinose.
- 61a. Calyx lobes triangular, midvein obscure; pin flower style slightly exceeding middle of corolla tube 224. *P. knuthiana*
- 61b. Calyx lobes lanceolate, midvein conspicuous; pin flower style nearly as long as corolla tube.
- 62a. Corolla tube 1.1–1.2 cm; thrum flower style or pin flower stamens reaching middle of corolla tube 222. *P. tayloriana*
- 62b. Corolla tube 1.2–1.5 cm; thrum flower style or pin flower stamens reaching basal 1/4 of corolla tube 223. *P. scopulorum*
- 60b. Leaves densely bright yellow farinose abaxially.
- 63a. Plants robust, with a tuft of thick stringy roots; scapes more than 8 cm; capsule slightly longer to 2 × as long as calyx 225. *P. pulchella*
- 63b. Plants dwarf, with fibrous roots; scape usually less than 8 cm; capsule shorter than calyx.
- 64a. Corolla tube 3–4 × as long as calyx; leaves membranous 228. *P. membranifolia*
- 64b. Corolla tube 2–3 × as long as calyx; leaves not membranous.
- 65a. Leaf blade obscurely crenate; calyx lobes subobtusely; corolla tube not cylindric, gradually widened from middle upward 232. *P. maikhaensis*
- 65b. Leaf blade conspicuously dentate or serrate on distal 1/2; calyx lobes acute; corolla tube cylindric, widened near mouth.

- 66a. Leaf rosettes 5–6 cm; leaf blade 1–2.3 cm wide; corolla tube of thrum flowers 1.4–1.5 cm 223. *P. scopulorum*
- 66b. Leaf rosettes 1–3 cm; leaf blade less than 1 cm wide; corolla tube of thrum flowers 1–1.3 cm.
- 67a. Scapes 1–1.5 × as long as pedicel; calyx 5–8 mm 230. *P. kialensis*
- 67b. Scapes at least 3 × as long as pedicel; calyx (2–)4–5(–7) mm 231. *P. yunnanensis*

1. *Primula duclouxii* Petitmengin, Monde Pl. 10: 7. 1908.

曲柄报春 qu bing bao chun

Primula forbesii Franchet var. *brevipes* Bonati; *P. forbesii* subsp. *duclouxii* (Petitmengin) W.W. Smith & Forrest; *P. refracta* Handel-Mazzetti.

Herbs perennial, sparingly pilose. Rhizomes to 3 cm, with numerous reddish brown fibrous roots. Leaves in a rosette; petiole 1–5 cm, nearly as long as leaf blade; leaf blade oblong to ovate, 1.5–4.5 × 1–3.5 cm, abaxially initially cream-yellow farinose, becoming efarinose or nearly so, base rounded to shallowly cordate, irregularly shallowly lobed; lobes in 4–6 pairs, margin sharply dentate, apex obtuse. Scapes 1–6 cm; umbels 1 or 2(or 3), superimposed, 3–10-flowered; bracts subulate, 3–9 mm, sometimes yellow farinose at base and abaxially. Flowers heterostylous. Pedicel reflexed after anthesis, 1–3 cm, white farinose. Calyx campanulate, 4–6 mm, ± farinose, finely glandular, parted slightly below middle; lobes lanceolate to linear-lanceolate. Corolla rose; tube 6–8 mm; limb 1.2–1.7 cm wide; lobes obcordate, deeply emarginate. Pin flowers: stamens inserted ca. 2 mm above base of corolla tube; style ca. 5 mm. Thrum flowers with positions reciprocal. Capsule globose, 3–3.5 mm in diam., included in calyx. Fl. Mar–Apr, fr. Apr–May.

* Shaded moist limestone rock crevices; 2200–2300 m. Yunnan (Fumin Xian, Kunming Shi).

2. *Primula petrocallis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 289. 1990.

饰岩报春 shi yan bao chun

Herbs perennial, pilose or glabrous. Rhizomes producing 1 or 2 leaf rosettes. Leaves in a rosette; petiole 1–2.5(–6) cm, narrowly winged, yellow farinose near base; leaf blade oblong, 1.5–3(–6) × 1–2(–4.5) cm, abaxially cream-white farinose, especially along midvein, base shallowly cordate, margin irregularly crenate-dentate to lobulate; lobes hydathode-denticulate, apex rounded. Scapes 2–8 cm; umbels 1 or 2, superimposed, 2–10-flowered; bracts linear to lanceolate, 3–6 mm. Flowers heterostylous. Pedicel divaricate after anthesis, 2–4 cm. Calyx campanulate, 3.5–6 mm, parted to middle; lobes densely pubescent, triangular to narrowly triangular, apex acute. Corolla rose-purple; limb 1.5–2 cm wide; lobes obovate, ca. 4.8 × 5.2 mm, 2-cleft at apex. Pin flowers: corolla tube 6–7 mm; stamens inserted ca. 2 mm

above base; style nearly as long as corolla tube. Thrum flowers: corolla tube ca. 1 cm; stamens at middle; style ca. 2 mm. Capsule unknown.

* Moist rocks; ca. 2200 m. Yunnan (Jingdong Xian).

- 1a. Leaves and scapes with multicellular hairs 2a. var. *petrocallis*
- 1b. Leaves and scapes glabrous 2b. var. *glabrata*

2a. *Primula petrocallis* var. *petrocallis*

饰岩报春(原变种) shi yan bao chun (yuan bian zhong)

Plants pilose. Scapes 2–3.5(–8) cm; umbel solitary, 2–10-flowered. Fl. Jun.

* Moist rocks; ca. 2200 m. Yunnan (Jingdong Xian).

2b. *Primula petrocallis* var. *glabrata* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 289. 1990.

无毛饰岩报春 wu mao shi yan bao chun

Plants glabrous. Scapes 5–6 cm; umbels 1 or 2, superimposed, 5–10-flowered. Fl. Jul.

* Shaded moist rocks; ca. 2200 m. Yunnan (Jingdong Xian).

3. *Primula divaricata* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 289. 1990.

叉梗报春 cha geng bao chun

Herbs perennial, sparsely pilose. Leaves in a rosette; petiole slender, 0.6–2.5 cm, narrowly winged; leaf blade ovate-elliptic to oblong, 0.5–1.5 cm × 4.8–12 mm, base truncate to shallowly cordate, 7–9-lobulate; lobes oblong to broadly triangular, 2–4 mm, margin with 1 or 2 teeth on each side, rarely entire, apex acute. Scapes 1.8–3.5 cm, usually with small petiolate leaves at apex; umbels 1, 2–4-flowered; bracts linear, 2–3 mm, glandular. Flowers heterostylous. Pedicel 6–13 mm. Calyx campanulate, 2–3 mm, enlarged to 4.5 mm in fruit, sparsely pubescent and glandular, parted to middle; lobes triangular, apex acute. Corolla rose-purple; tube ca. 5 mm; limb ca. 1 cm wide; lobes 2-cleft, cuneate-obovate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, ca. 3 mm in diam., slightly shorter than calyx. Fl. Apr, fr. Apr–May.

* Rocks, trailsides; 1800–2700 m. Yunnan (Jingdong Xian).

4. *Primula epilithica* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 289. 1990.

石面报春 shi mian bao chun

Herbs perennial, densely rust-colored pilose. Leaves in a rosette; petiole slender, slightly longer than leaf blade; leaf blade ovate to elliptic, 0.8–2.6 × 0.7–2.2 cm, base cordate, 8–10-lobulate, apex rounded; lobes broadly triangular, margin with 1 or 2 teeth, apex acute. Scapes shorter than leaves, 1–2.5 cm; umbels 1, 2–6-flowered; bracts linear-lanceolate, 2–3 mm. Pedicel divaricate after anthesis, 0.8–2.5 cm. Flowers heterostylous. Calyx campanulate, ca. 4 mm, parted to middle; lobes ovate-triangular, apex acute. Corolla pink; tube 6–7 mm; limb 0.8–1.5 cm wide; lobes obovate, 2-cleft. Pin flowers: stamens near base of corolla tube; style slightly shorter than tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1 mm. Capsule globose, ca. 2.5 mm in diam. Fl. Oct–Dec.

* Rocky areas; 2300–2500 m. Yunnan (Jingdong Xian).

5. *Primula hypoleuca* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 57: 238. 1920.

白背报春 bai bei bao chun

Primula forbesii Franchet subsp. *hypoleuca* (Handel-Mazzetti) W.W. Smith & Forrest.

Herbs perennial, farinose, glabrous. Rhizomes produce a rosette or rarely a very short stem. Leaves in a rosette; petiole narrowly winged, 1.5–6 cm, usually slightly longer than leaf blade; leaf blade oblong to elliptic, 1.5–4.5 × 1–2(–2.5) cm, abaxially densely white farinose, base subtruncate to cordulate, margin crenate-lobulate; lobules obtuse, 1–3 mm, apex rounded. Scapes 10–25 cm; umbels 1–3, superimposed, 4–10-flowered; bracts lanceolate, 4–7 mm, initially white farinose. Flowers heterostylous. Pedicel 0.8–2.4 cm, ± glandular. Calyx broadly campanulate, 3.5–4.5 mm, slightly enlarged in fruit, white farinose, parted to middle; lobes triangular, apex acute. Corolla pink; tube 4–6 mm; limb 0.8–1.5 cm wide; lobes broadly obovate, emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. 3 mm. Thrum flowers: stamens slightly above middle of corolla tube; style ca. 1 mm. Capsule unknown. Fl. Apr.

* Wet lakeshores, reeds; ca. 1900 m. Yunnan (Kunming Shi).

6. *Primula forbesii* Franchet, Bull. Soc. Bot. France 33: 64. 1886.

小报春 xiao bao chun

Primula androsacea Pax; *P. barbeyana* Petitmengin; *P. forbesii* subsp. *androsacea* (Pax) W.W. Smith & Forrest; *P. multicaulis* Petitmengin; *P. willmottiae* Petitmengin.

Herbs biennial, with numerous fibrous roots. Leaves usually numerous; petiole 1–3(–5) cm, narrowly winged, with multicellular white hairs; leaf blade oblong to elliptic or ovate-elliptic, 1–3.5 × 0.5–2.5 cm, abaxially sparsely minutely glandular and pubescent mainly along veins, adaxially sparingly pilose, base truncate to shallowly cordate, margin crenate-lobulate, apex rounded; lobes denticulate. Scapes 1 to many, 6–13 cm, sparingly pilose or glabrescent, farinose toward apex; umbels 1 or 2(–4), superimposed, 4–8-

flowered; bracts lanceolate, 2.5–5.5 mm, ± farinose, apex acute. Flowers heterostylous. Pedicel 0.6–2 cm, elongated to 3 cm in fruit, glandular. Calyx campanulate, 3–4.5 mm, olive-green or yellowish green farinose, parted to middle; lobes triangular, apex acute. Corolla pink, rarely white; tube 4.5–5.5 mm; limb ca. 1 cm wide; lobes broadly obovate, emarginate. Pin flowers: stamens ca. 1.5 mm above base of corolla tube; style ca. 3 mm. Thrum flowers: stamens ca. 3 mm above base of corolla tube; style ca. 1 mm. Capsule globose, ca. 3 mm in diam. Fl. Feb–Mar, fr. Mar–Apr. $2n = 18^*$, 24^* .

* Margins of rice paddies, low hills; 1500–2000 m. SW Sichuan, C and NE Yunnan.

7. *Primula effusa* W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 40. 1923.

散花报春 san hua bao chun

Herbs perennial, with a short rhizome. Leaves in a rosette; petiole 3–12(–16) cm, usually glabrous, efarinose or slightly white farinose toward apex; leaf blade rounded-ovate to subreniform, 1.5–4.5(–7) cm and ca. as wide, initially finely glandular pubescent, glabrescent, base cordate, margin obscurely undulate-lobulate, irregularly dentate, with broad triangular teeth, often toothed again, apex rounded. Umbels 1–3(–5), superimposed, 5–16-flowered; bracts linear-lanceolate, 3–6 mm, glabrous, occasionally farinose. Flowers heterostylous. Pedicel slender, 2–5 cm, glabrous or nearly so, sometimes farinose. Calyx campanulate, 3.5–4.5 mm, ± farinose, parted to ± middle; lobes lanceolate, apex acute. Corolla pink or lavender-rose, with a white eye; tube yellow or orange, 7–8 mm; limb ca. 1.3 cm wide; lobes obcordate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style reaching middle of tube. Thrum flowers: stamens near middle of corolla tube; style ca. 1 mm. Capsule globose, 3–4 mm in diam. Fl. May–Aug. $2n = 18^*$.

* Shaded moist areas near cultivated fields, along irrigation ditches; 1400–2600 m. C and N Yunnan.

8. *Primula malacoides* Franchet, Bull. Soc. Bot. France 33: 64. 1886.

报春花 bao chun hua

Primula delicata Petitmengin; *P. forbesii* Franchet subsp. *delicata* (Petitmengin) W.W. Smith & Forrest; *P. malacoides* subsp. *pseudomalacoides* (L. B. Stewart) W.W. Smith & Forrest; *P. pseudomalacoides* L. B. Stewart.

Herbs biennial, usually ± farinose. Leaves numerous; petiole 2–15 cm, pilose, succulent; leaf blade ovate to elliptic or oblong-elliptic, 3–10 × 2–8 cm, abaxially pubescent along veins or subglabrous, efarinose or sometimes sprinkled with white farina, adaxially sparsely pilose or subglabrous, base cordate to truncate, margin crenate-lobulate with 6–8 pairs of denticulate lobules, apex rounded. Scapes 1 to many, 10–40 cm, pilose or glabrescent, efarinose or slightly white farinose; umbels (1 or) 2–6, superimposed, 4–20-flowered; bracts linear to linear-lanceolate, 3–8 mm, farinose or efarinose. Flowers heterostylous. Pedicel 1.5–4 cm. Calyx campanulate, 3–7

mm, slightly enlarged in fruit, usually cream-white farinose, parted to middle; lobes triangular, apex acute. Corolla rose or lavender; tube 4–6 mm; limb 0.5–1.5 cm wide; lobes broadly obovate, deeply 2-lobed. Pin flowers: corolla tube ca. as long as calyx; stamens 1.5–2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube ca. 1.5 × as long as calyx; stamens slightly above middle of corolla tube; style ca. 1 mm. Capsule globose, ca. 3 mm in diam. Fl. Feb–May, fr. Mar–Jun. $2n = 18^*, 22^*, 24^*, 36^*, 66^*$.

* Wet areas near cultivated fields, ditches, forest margins; 1800–3000 m. W Guangxi, Guizhou, Yunnan.

This species is widely cultivated as a beautiful potted plant. It was introduced to Europe in 1896 and since then, many horticultural forms have been produced.

9. *Primula pellucida* Franchet, Bull. Soc. Bot. France 35: 428. 1888.

钻齿报春 zuan chi bao chun

Primula debilis Bonati; *P. speluncicola* Petitmengin.

Herbs biennial, efarinose. Leaves in a rosette; petiole 1–3 cm, narrowly winged, sparingly pilose; leaf blade ovate to oblong, 1.5–3.5 × 1–2.5 cm, sparsely pilose mainly along veins abaxially, base cordate, margin crenate-dentate with acute or subobtuse teeth and sometimes toothed again, apex rounded. Scapes slender, 3–13 cm, sparsely pilose; umbels 1 or 2, superimposed, 2–6-flowered; bracts subulate, 2–4 mm, apex acute. Flowers heterostylous. Pedicel glabrous, 1.5–2.5 cm. Calyx broadly campanulate, 3–5 mm, glabrous or nearly so, parted to ± middle; lobes triangular to ovate-lanceolate, apex sometimes slightly recurved, acute. Corolla rose to lavender with a yellow eye; tube 8–9 mm; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens 2–2.5 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: stamens 7–7.5 mm above base of corolla tube; style slightly longer than calyx. Capsule globose, included in calyx.

* Moist rocks, bamboo forests; ca. 2000 m. S Sichuan, NE Yunnan.

10. *Primula interjacens* Chen, Acta Phytotax. Sin. 1: 175. 1951.

景东报春 jing dong bao chun

Herbs perennial, pilose or glabrous. Rhizomes stout, woody, with withered remains of old foliage. Leaves in a rosette; petiole slender, 3–8 cm, narrowly winged, vaginate at base; leaf blade broadly ovate to suborbicular, 2–5.5 × 2–5 cm, abaxially densely fugacious cream-yellow farinose, base cordate, margin undulate to broadly crenate, apex rounded. Leaves of previous year papery, ± bullate. Scapes purplish brown, 8–14 cm; umbels in 1 or 2 whorls, 3–8-flowered, sparsely farinose; bracts lanceolate to oblong, 4–7 mm, apex acute. Flowers heterostylous. Pedicel 1.5–3.5 cm. Calyx campanulate, ca. 5 mm, parted to middle; lobes ovate to ovate-triangular, apex acute. Corolla rose, initially yellow farinose outside; tube 9–10 mm; limb ca. 2 cm wide; lobes

broadly obovate and deeply 2-cleft. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens ca. 8 mm above base of corolla tube; style ca. 2 mm. Capsule globose, ca. as long as calyx.

* Rocks; ca. 2200 m. Yunnan (Jingdong Xian).

1a. Plants pubescent 10a. var. *interjacens*

1b. Plants glabrous 10b. var. *epilosa*

10a. *Primula interjacens* var. *interjacens*

景东报春(原变种) jing dong bao chun (yuan bian zhong)

Plants pilose. Calyx efarinose. Fl. Jun.

* Rocks; ca. 2200 m. Yunnan (Jingdong Xian).

10b. *Primula interjacens* var. *epilosa* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2):290. 1990.

光叶景东报春 guang ye jing dong bao chun

Plants glabrous. Calyx yellow farinose. Fl. Jun.

* Moist rocks; ca. 2200 m. Yunnan (Jingdong Xian).

11. *Primula cavaleriei* Petitmengin, Bull. Acad. Int. G. Bot. 18: 256. 1908.

黔西报春 qian xi bao chun

Herbs perennial, efarinose. Rhizomes slender, with dense rust-colored multicellular hairs at apex. Leaves in a rosette; petiole 10–15 cm, densely rust-colored pilose; leaf blade suborbicular to reniform, 3–9 cm wide, membranous when dry, ± pilose, base cordate, margin obscurely crenate-lobulate, minutely denticulate, apex rounded. Scapes 13–22 cm, rust-colored pilose; umbels 1–4, superimposed, 3–8-flowered; bracts narrowly lanceolate to linear, 5–6 mm, pilose. Flowers heterostylous. Pedicel 1–2.5 cm, pilose. Calyx campanulate, 3–4 mm, with rust-colored multicellular hairs, parted to ± middle; lobes lanceolate, apex acute. Corolla bluish; tube 8–9 mm; limb 8–10 mm wide; lobes obovate, emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: stamens toward apex of corolla tube; style slightly shorter than calyx. Capsule globose, ca. as long as calyx.

* Shaded rock crevices. C Guizhou (Huishui Xian), SE Yunnan (Mengzi Xian).

12. *Primula lithophila* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 290. 1990.

习水报春 xi shui bao chun

Herbs perennial, efarinose. Rhizomes to 4 cm, with numerous purplish brown roots, with dense coarse tawny hairs at apex. Leaves in a rosette; petiole 3–10 cm, narrowly winged, densely rust-colored pilose; leaf blade suborbicular to broadly ovate, 2.5–6 cm wide, membranous when dry, abaxially sparsely pilose, pubescent along veins, base cordate, margin obscurely remote crenate or subentire, apex rounded. Scapes 9–15 cm, pilose; umbels 1–3, superimposed, 2–6-flowered; bracts linear, 5–9 mm, pilose.

Flowers heterostylous. Pedicel 0.5–1.5 cm, pilose. Calyx narrowly campanulate, 7–10 mm, with multicellular hairs, more densely pubescent near base, parted ca. to upper 1/3; lobes ovate-triangular, 2–3 mm, apex acute or subobtusate. Corolla rose; tube cylindric, ca. 1.1 cm; limb 5.6–8 mm wide; lobes obovate, ca. 3 × 1.8 mm, emarginate. Pin flowers: stamens near base of corolla tube; style ca. 9 mm. Thrum flowers: stamens at middle of corolla tube; style ca. 2 mm. Capsule cylindric, ca. as long as calyx. Fl. Jul–Aug, fr. Sep.

* Moist rocks in ravines. NW Guizhou (Xishui Xian).

13. *Primula tsiangii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 18: 63. 1933.

绒毛报春 rong mao bao chun

Herbs perennial, with long thin rhizomes and numerous fibrous roots. Leaves in a rosette; petiole 2.5–8.5 cm, densely fulvous tomentose; leaf blade suborbicular to reniform, 2–4.5 × 2.5–5 cm, abaxially with thick tawny wool, detachable in flecks, adaxially with pale tawny appressed multicellular hairs, base cordate, margin entire or obscurely sinuate, apex rounded. Scapes 8–17 cm, densely fulvous tomentose; umbels 1 or 2, superimposed, 2–10-flowered, densely tomentose; bracts linear, 3–4 mm. Pedicel 0.8–2 cm. Flowers heterostylous. Calyx campanulate, 4–5 mm, tomentose, parted to ± middle; lobes broadly ovate, apex acute. Corolla bluish; tube ca. 3 × as long as calyx; limb 7–10 mm wide; lobes obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Capsule globose, 3.5–4 mm in diam., slightly shorter than calyx. Fl. Mar–Apr, fr. May.

* Moist cliffs; ca. 500 m. Guizhou (Tongzi Xian).

14. *Primula ambita* I. B. Balfour, Trans. Bot. Soc. Edinburgh 26: 325. 1915.

圆回报春 yuan hui bao chun

Primula flavicans Handel-Mazzetti.

Herbs perennial. Rhizomes woody, with 1 to several leaf rosettes. Leaves in a rosette; petiole ca. as long as leaf blade, 3–12 cm, with dense tangled hairs, vaginate at base; leaf blade broadly ovate to reniform or oblong-rotund, 2–10 cm wide, abaxially spreading pubescent along veins, adaxially sparsely pilose, base cordate, sinuate to sublobulate, apex rounded; lobules hydathode-denticulate, ciliate. Scapes to 20 cm, with dense multicellular hairs; umbels compact, many flowered; bracts lanceolate to obovate, 8–10 × 1.5–3(–5) mm, apex acute to acuminate. Flowers heterostylous. Pedicel 0.8–1.5 cm, densely pilose. Calyx broadly campanulate, 7–9 mm, pubescent, parted to ca. 1/4; lobes triangular, apex hydathode-apiculate. Corolla yellow; tube 8–10 mm, ± pubescent outside; limb 8–10 mm wide; lobes oblong to rectangular-obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style nearly as long as tube. Thrum flowers with positions reciprocal. Capsule globose, included in calyx. Fl. Jun–Jul.

* Wet areas near streams and gullies; 2000–2700 m. C Yunnan.

15. *Primula oreodoxa* Franchet, Bull. Soc. Bot. France 33: 66. 1886.

迎阳报春 ying yang bao chun

Herbs perennial. Roots numerous, fibrous. Leaves in a rosette; petiole 1.5–5 cm, narrowly winged, with white multicellular hairs; leaf blade oblong to ovate-elliptic, 1.5–6 × 1.2–5 cm, with multicellular white hairs along veins, base shallowly cordate, 9–11-lobulate, apex rounded; lobules broadly triangular to subrotund, margin irregularly dentate. Scapes 3–15 cm, with multicellular white hairs; umbels usually 1(or 2), superimposed, 2–6(–10)-flowered; bracts linear-lanceolate, 5–12 mm. Flowers heterostylous. Pedicel 0.7–2 cm, pilose. Calyx broadly campanulate, 5–8 mm, enlarged to 1.2 cm in fruit, sparsely pilose, parted to middle or above; lobes broadly ovate, margin denticulate. Corolla rose-purple; tube 7.5–9 mm; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 4 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, included in calyx. Fl. Apr–May.

* Moist glades, margins of mixed woodlands, streamsides; 1200–2500 m. W Sichuan.

16. *Primula dumicola* W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 40. 1923.

灌丛报春 guan cong bao chun

Herbs perennial. Rhizomes subwoody, with numerous fibrous roots. Leaves in a rosette; petiole ca. as long as leaf blade, densely pilose; leaf blade ovate-oblong to oblong, 2–5 × 1.5–4 cm, with multicellular white hairs, base shallowly cordate to subtruncate, apex rounded, 11–13-lobulate; lobules broadly triangular, margin irregularly incised-dentate. Scapes 6–30 cm, pilose; umbels 1 or 2, superimposed, 6–10-flowered; bracts linear to linear-lanceolate, 4–7 mm, white pilose. Flowers homostylous. Pedicel 0.8–1.5 cm, pubescent. Calyx broadly campanulate, 4–5 mm, enlarged to 8 mm in fruit, with long white hairs, parted to 1/4–1/3, usually 5-veined; lobes triangular, apex acute. Corolla rose; tube ca. 6 mm; limb 5–8 mm wide; lobes obovate, emarginate. Stamens near middle of corolla tube. Style ca. 4 mm, reaching stamens. Capsule globose, included in calyx. Fl. May.

* Granite rocks along rivulets, mixed forests; 2400–3000 m. E Xizang, NW Yunnan.

17. *Primula barbicalyx* C. H. Wright, Bull. Misc. Inform. Kew 1896: 24. 1896.

毛萼报春 mao e bao chun

Primula obconica Hance subsp. *barbicalyx* (C. H. Wright) W. W. Smith.

Herbs perennial. Leaves in a rosette; petiole 1.5–7 cm, with dense tawny multicellular hairs; leaf blade ovate-elliptic to oblong, (1.5–)2–10 × 1.5–5.8 cm, abaxially sparsely pilose along veins, adaxially pubescent or glabrescent, base cordate or sometimes subrounded to truncate, margin 4–6-repand-dentate, apex subrounded. Scapes shorter than leaf rosette,

0.5–3 cm, densely pilose; umbels 1, 2–8-flowered; bracts linear-lanceolate, 2–5 mm, pubescent. Flowers heterostylous. Pedicel 0.5–2(–3) cm, pilose. Calyx broadly campanulate, 4–7 mm, parted to 1/3, base densely pilose; lobes triangular to ovate-triangular, apex acute. Corolla rose to nearly white; tube 0.9–1.1 cm; limb 1–1.5 cm; lobes obovate, emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens near apex of tube; style near base of tube. Capsule unknown.

* Limestone rock crevices; 1500–2900 m. SE Yunnan (Guangnan Xian, Mengzi Xian).

18. *Primula densa* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 9. 1920.

小叶鄂报春 xiao ye e bao chun

Primula obconica Hance subsp. *densa* (I. B. Balfour) W. W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1–2 cm, to 4 cm at fruiting, with dense multicellular white hairs; leaf blade broadly ovate to ovate-oblong, 1–2 × 0.8–2 cm at anthesis, to 4 × 3.5 cm at fruiting, abaxially sparsely minutely glandular, pilose along veins, adaxially glabrous or puberulent, base cordate or sometimes slightly cuneate, margin crenulate-lobulate, apex rounded. Scapes 3–13 cm, sparsely pilose and glandular; umbels 1 or 2, superimposed, 2–10-flowered; bracts linear to narrowly oblong, 2–4 mm, ± pubescent, apex acute, sometimes with small petiolate leaves arising from axils of bracts. Flowers heterostylous. Pedicel 0.3–2 cm, with dense minute glands intermixed with few multicellular hairs. Calyx broadly campanulate, 2.8–4 mm, glabrous or pilose, parted nearly to middle; lobes triangular to ovate-triangular, apex acute. Corolla pink to lavender-rose, with a yellow eye; limb 1–1.5 cm wide; lobes obovate, emarginate. Pin flowers: corolla tube 6–7 mm; stamens 3–3.5 mm above base of corolla tube; style ca. 4.5 mm. Thrum flowers: corolla 7.5–8 mm; stamens near tube apex; style ca. 2.5 mm. Capsule unknown. Fl. Jun–Jul.

Shaded limestone rock crevices, damp moss on limestone cliffs; 2300–2700 m. W Yunnan (Pianma Xian) [N Myanmar].

19. *Primula vilmoriniana* Petitmengin, Bull. Herb. Boissier, S開. 2, 8: 365. 1908.

毛业鄂报春 mao ye e bao chun

Primula obconica Hance subsp. *vilmoriniana* (Petitmengin) W. W. Smith & Forrest; *P. subtropica* Handel-Mazzetti.

Herbs perennial. Leaves in a rosette; petiole 2–6 cm, usually 1/3–1/2 as long as leaf blade, with dense tangled fulvous hairs; leaf blade oblong-elliptic to orbicular, 4–11 × 4–8 cm, abaxially with multicellular fulvous hairs along veins, adaxially densely strigose-pubescent, base shallowly cordate, slightly repand, margin obscurely denticulate to subentire, apex rounded; reticulate veinlets markedly elevated abaxially. Scapes (5–)15–23 cm, fulvous pilose; umbels 1, compact, (4–) 15–25-flowered; bracts linear to linear-lanceolate, 3–5 mm, pubescent. Flowers heterostylous.

Pedicel 5–10 mm, densely fulvous-pubescent. Calyx cupular to broadly campanulate, 4–5 mm, sparsely pilose, parted to 1/4; lobes triangular, apex acute. Corolla rose; limb 5–8 mm wide; lobes obovate-oblong, ca. 3 × 2–2.8 mm, apex 2-cleft. Pin flowers: corolla tube ca. 5 mm; stamens ca. 1.5 mm above base of corolla tube; style ca. 4 mm. Thrum flowers: corolla tube ca. 6 mm; stamens ca. 3 mm above base of corolla tube; style ca. 1.5 mm. Capsule unknown. Fl. Apr.

* Open forests, thickets; ca. 1600 m. C and W Yunnan.

20. *Primula obconica* Hance, J. Bot. 18: 234. 1880.

鄂报春 e bao chun

Herbs perennial. Leaves in a rosette; petiole 1.5–14 cm, with white or fulvous multicellular hairs; leaf blade ovate-rotund to elliptic or oblong, (1.5–)3–14(–17) × (1–)2.5–11 cm, abaxially glabrous or sparsely pilose, especially along veins, adaxially glabrescent, puberulent or short pilose, base cordate or occasionally rounded, margin subentire, repand or sinuate-lobulate, apex rounded. Scapes longer or shorter than leaf rosette, with white or tawny, multicellular hairs; umbels 1, 2–13-flowered; bracts linear to linear-lanceolate, 3–10 mm. Flowers heterostylous or homostylous. Pedicel (1.5–)5–20(–25) cm, pubescent. Calyx cupular to broadly campanulate, puberulent or short pilose, parted to 1/4–1/3; lobes broadly triangular, ciliate, apex hydatode-apiculate. Corolla pink to lavender-rose, rarely white; tube ca. 2 × as long as calyx; limb 1.5–2.5 cm wide; lobes broadly obovate emarginate. Pin flowers: stamens near base of corolla tube; style nearly reaching tube mouth. Thrum flowers: stamens at middle of tube; style 2–2.5 mm. Homostylous flowers with stamens near tube apex; style reaching stamens. Capsule unknown. 2n = 22*, 62*.

* Thickets, forests, rocks in mountain woods, dry limestone cliffs; 500–3300 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

- 1a. Leaf blade ovate-elliptic to oblong, usually much longer than wide.
- 2a. Leaves thin papery when dry, margin subentire or repand 20a. subsp. *obconica*
- 2b. Leaves membranous when dry, margin sinuate-lobulate 20b. subsp. *werringtonensis*
- 1b. Leaf blade ovate-rotund to sub-orbicular, ca. as long as wide or slightly longer than wide.
 - 3a. Scapes shorter than leaf rosette and only slightly longer than pedicel 20e. subsp. *parva*
 - 3b. Scapes longer than leaf rosette and many × longer than pedicel.
 - 4a. Leaves densely black punctate abaxially 20c. subsp. *nigroglandulosa*
 - 4b. Leaves epunctate 20d. subsp. *begoniiformis*

20a. *Primula obconica* subsp. *obconica*

鄂报春(原亚种) e bao chun (yuan ya zhong)

Primula bonatii R. Knuth; *P. obconica* subsp. *petitmenginii* (Bonati) W.W. Smith & Forrest; *P. obconica* var. *glabrescens* Franchet, p.p.; *P. obconica* var. *hispidula* Franchet; *P. petitmenginii* Bonati; *P. poculiformis* J. D. Hooker.

Leaf blade ovate-elliptic to oblong, thin papery when dry, margin subentire, denticulate or repand. Fl. Mar–Jun.

* Shaded wet areas in thickets and forests; 500–2200 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

20b. *Primula obconica* subsp. *werringtonensis* (Forrest) W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 33. 1928.

波叶鄂报春 bo ye e bao chun

Primula werringtonensis Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 55. 1924; *P. obconica* var. *werringtonensis* (Forrest) W.W. Smith & Forrest.

Leaf blade broadly ovate to ovate-elliptic, membranous when dry, margin usually sinuate-lobulate. Fl. May–Jun. $2n = 24^*$.

* Streamside thickets, open forests; 3000–3300 m. W Sichuan, N Yunnan.

20c. *Primula obconica* subsp. *nigroglandulosa* (W.W. Smith & H. R. Fletcher) C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 22. 1990.

黑腺鄂报春 hei xian e bao chun

Primula obconica Hance var. *nigroglandulosa* W. W. Smith & H. R. Fletcher, Trans. Roy. Soc. Edinburgh 61(2): 426. 1946.

Leaf blade suborbicular, abaxially densely minutely black glandular punctate.

* W Yunnan (Lushui Xian, Tengchong Xian).

20d. *Primula obconica* subsp. *begoniiformis* (Petitmengin) W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 33. 1928.

海棠叶鄂报春 hai tang ye e bao chun

Primula begoniiformis Petitmengin, Bull. Soc. Sci. Nancy, S開. 3, 8: 11. 1907; *P. listeri* Forbes & Hemsley var. *glabrescens* Franchet; *P. listeri* var. *rotundifolia* (Franchet) Franchet; *P. obconica* Hance var. *rotundifolia* Franchet.

Petiole slender, ± wiry; leaf blade ovate-rotund to suborbicular, ca. as long as wide, margin crenate-lobulate.

* Rocks in mountain woodlands; 1600–2200 m. SW Sichuan, W Yunnan.

This variety closely resembles *Primula sinolisteri* I. B. Balfour var. *sinolisteri* but differs by having pilose petioles.

20e. *Primula obconica* subsp. *parva* (I. B. Balfour) W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 33. 1928.

小型鄂报春 xiao xing e bao chun

Primula parva I. B. Balfour, J. Roy. Hort. Soc. 39: 142. 1913.

Leaf blade broadly ovate to suborbicular, 1.5–5 cm, margin repand to sinuate. Scapes 1–4 cm, shorter than leaves.

* Dry limestone cliffs; 1800–2000 m. C Yunnan (Huize Xian, Kunming Shi).

21. *Primula rubifolia* C. M. Hu, Acta Phytotax. Sin. 26: 307. 1988.

莓叶报春 mei ye bao chun

Herbs perennial. Rhizomes comparatively stout, woody, with remains of old foliage. Leaves in a rosette; petiole (3–) 5–17 cm, densely fulvous pilose; leaf blade broadly ovate to suborbicular, 3–8.5 × 2.5–9.5 cm, abaxially pubescent mainly along veins, adaxially sparsely strigillose or glabrescent, base deeply cordate, 7–9-lobulate, apex rounded to obtuse; lobules broadly ovate or subrounded, margin remotely hydathode-denticulate; lateral veins 3 or 4 pairs, proximal 1 or 2 pairs basal. Scapes 5–17 cm, elongated to 23 cm in fruit, densely fulvous pilose; umbels 1(or 2), superimposed, 4–10-flowered; bracts linear, 3–7 mm, pilose. Flowers heterostylous. Pedicel 1–2 cm, fulvous pilose. Calyx broadly campanulate, 5–8.5 mm, pubescent, parted to ca. 1/4; lobes broadly triangular to subrotund, ciliate, apex apiculate. Corolla pale rose, with fulvous hairs outside; tube 1.1–1.3 cm; limb 1.2–2 cm wide; lobes obovate, emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, ca. 3 mm in diam. Fl. Mar–Jun.

* Rocks in mixed forests; 1600–2900 m. Yunnan (Jingdong Xian).

22. *Primula sinolisteri* I. B. Balfour, Trans. Bot. Soc. Edinburgh 26: 330. 1915.

铁梗报春 tie geng bao chun

Herbs perennial. Rhizomes comparatively stout, woody, with remains of old foliage. Leaves in a rosette; petiole ± wiry, 3–13 cm, vaginate and usually tinged with red at base; leaf blade broadly ovate to suborbicular, 2–8.5 × 2–7 cm, glabrous or sparsely puberulent, base cordate, margin undulate-lobulate, apex rounded to obtuse, sometimes acute; lobules broadly triangular to suborbicular, margin remotely hydathode-denticulate; veins 3 or 4 pairs, proximal 1 or 2 pairs basal. Scapes 5–20 cm; umbels 1, 2–8-flowered; bracts linear to lanceolate, 3–8 mm, pubescent. Flowers heterostylous or homostylous. Pedicel 7–12(–20) mm. Calyx broadly campanulate, 4–10 mm, short pubescent, parted to 1/3; lobes broadly triangular, apex acute to apiculate. Corolla white or rose; limb 1.5–2.5 cm wide; lobes obovate, 2-lobed. Capsule globose, included in calyx. $2n = 24^*$.

* Stony grassy slopes, open forests, rocks and mossy banks of shaded slopes bordering valleys; 2300–3300 m. C and W Yunnan.

- 1a. Flowers heterostylous; petiole and scapes puberulent or short pubescent 22a. var. *sinolisteri*
1b. Flowers homostylous; petiole and scapes pilose 22b. var. *aspera*

22a. *Primula sinolisteri* var. *sinolisteri*

铁梗报春(原变种) tie geng bao chun (yuan bian zhong)

Primula obconica Hance var. *glabrescens* Franchet, p.p.; *P. obconica* subsp. *sinolisteri* (I. B. Balfour) W. W. Smith & Forrest.

Scapes and petiole puberulent or short pubescent. Flowers heterostylous. Calyx 4–7 mm. Corolla white or pale rose. Pin flowers: corolla tube 9–10 mm; stamens 3.5–4 mm above base of corolla tube; style reaching mouth of tube. Thrum flowers: corolla tube 1–1.3 cm; stamens ca. 8 mm above tube base; style ca. 3 mm. Capsule globose, included in calyx. Fl. Feb–Aug.

* Stony grassy slopes, open forests; 2300–3000 m. C and W Yunnan.

22b. *Primula sinolisteri* var. *aspera* W. W. Smith & H. R. Fletcher, Trans. Roy. Soc. Edinburgh 61(2): 428. 1946.

糙叶铁梗报春 cao ye tie geng bao chun

Scapes and petiole pilose, with multicellular hairs. Flowers homostylous. Calyx to 1 cm. Corolla rose-lavender or dark purplish rose; stamens and style located in upper portion of tube.

* Rocks and mossy banks of shaded slopes bordering valleys; 3000–3300 m. SW Yunnan (Tengchong Xian).

23. *Primula asarifolia* H. R. Fletcher, J. Linn. Soc., Bot. 52: 336. 1942.

细辛叶报春 xi xin ye bao chun

Herbs perennial. Rhizomes short, with withered leaves at apex. Leaves in a rosette; petiole (2–)4–12 cm, pubescent, vaginate at base; leaf blade ovate-rounded to reniform, 2–5.5 cm wide, adaxially initially sparsely pubescent, soon glabrescent except near margin, base deeply cordate, margin obscurely 5–7-lobulate, apex obtuse; lobes broadly triangular, ciliate, margin remotely hydathode-denticulate; veins 3 or 4 pairs, proximal 2 pairs basal. Scapes 10–22 cm, pubescent or glabrescent on lower part; umbels 4–8-flowered, short pubescent; bracts lanceolate to linear-lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 5–10 mm. Calyx broadly campanulate, 5–6 mm, short pubescent, parted to ca. 1/3; lobes triangular, short ciliate, apex acute. Corolla purple, ± pubescent outside; tube ca. 1.3 cm; limb 5–8 mm wide; lobes obovate-cuneate, ca. 3 × 1.5–2 mm, apex 2-cleft. Pin flowers: stamens in lower 1/2 of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 4 mm. Capsule unknown.

* Mixed forests; 1600–2900 m. SW Yunnan (Zhenkang Xian).

24. *Primula pauliana* W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 51. 1923.

总序报春 zong xu bao chun

Herbs perennial. Leaves in a rosette; petiole 7–18 cm, sparsely pilose; leaf blade suborbicular to broadly ovate, 3–10 cm wide, abaxially pubescent along veins, adaxially sparsely pilose or subglabrous, base deeply cordate, margin palmately 7-lobulate; lobules triangular, margin irregularly dentate, ciliate; veins 2 or 3 pairs, proximal 1 or 2 pairs basal. Scapes 15–45 cm, pilose; inflorescences racemose, 10–30-flowered; bracts linear to linear-lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 5–10 mm, densely short glandular pubescent. Calyx narrowly campanulate, 5–6 mm, glandular pubescent outside, glabrous inside, parted to middle, distinctly 5-veined; lobes narrowly triangular. Corolla pale yellow or rose-purple; tube ca. 1.1 cm; limb 1.5–2 cm; lobes obovate, 6–7 × ca. 5 mm, emarginate. Pin flowers: stamens near base of corolla tube; style ca. as long as tube. Thrum flowers: stamens near apex of corolla tube; style ca. 1.5 mm. Capsule oblong, 1–1.5 cm, 2–3 × longer than calyx. $2n = 24^*$.

* Open meadows, thicket margins, moist rock crevices, wet areas in mountain valley woodlands; 2500–3000 m. Sichuan, N Yunnan.

- 1a. Corolla pale yellow 24a. var. *pauliana*
1b. Corolla rose-purple 24b. var. *huiliensis*

24a. *Primula pauliana* var. *pauliana*

总序报春(原变种) zong xu bao chun (yuan bian zhong)

Corolla pale yellow. Fl. Jul.

* Open meadows, thicket margins, moist rock crevices; 2500–3000 m. SW Sichuan, N Yunnan.

24b. *Primula pauliana* var. *huiliensis* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 290. 1990.

会理总序报春 hui li zong xu bao chun

Corolla rose-purple. Fl. Jul.

* Wet areas in mountain valley woodlands; ca. 2500 m. W Sichuan (Huili Xian).

25. *Primula mollis* Nuttall ex Hooker, Bot. Mag. 80: t. 4798. 1854.

灰毛报春 hui mao bao chun

Primula mollis Nuttall ex Hooker subsp. *seclusa* (I. B. Balfour & Forrest) W. W. Smith & Forrest; *P. seclusa* I. B. Balfour & Forrest.

Herbs perennial, robust. Leaves in a rosette; petiole 5–20 cm, densely pilose; leaf blade suborbicular to reniform, 4–18 cm wide, abaxially with scattered, black or reddish, minute glands and multicellular hairs along veins, adaxially densely pilose, base deeply cordate, margin sinuate-lobulate and denticulate-crenulate. Scapes 10–60 cm, with multicellular hairs; umbels 3–10, superimposed, 4–10-flowered; bracts narrowly lanceolate, 0.5–1.5 cm, with long hairs. Flowers

heterostylous or homostylous. Pedicel 1–3 cm, sparsely pilose. Calyx narrowly campanulate, 8–11 mm, pubescent, often tinged with purple, parted to middle; lobes ovate to ovate-lanceolate; veins 3–5. Corolla dark rose to deep crimson; tube ca. 1.2 cm; limb 1–2 cm wide; lobes oblong-obovate, ca. 7 mm, emarginate. Homostylous flowers with stamens near middle of corolla tube; style reaching stamens. Pin flowers: stamens at middle of corolla tube; style slightly shorter than tube, ca. 1 mm. Capsule ellipsoid, slightly shorter than calyx. $2n = 24$.

Broad-leaved forests; 2400–2700 m. W Yunnan (Pianma Xian, Tengchong Xian) [Bhutan, N Myanmar].

26. *Primula sinomollis* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 44. 1915.

华柔毛报春 hua rou mao bao chun

Primula cinerascens Franchet subsp. *sinomollis* (I. B. Balfour & Forrest) W. W. Smith & Forrest; *P. cinerascens* subsp. *sylvicola* (Hutchinson) W. W. Smith & Forrest; *P. sinomollis* var. *alba* I. B. Balfour & Forrest; *P. sylvicola* Hutchinson.

Herbs perennial, with numerous fibrous roots. Leaves in a rosette; petiole 5–15 cm, densely rust-colored pilose; leaf blade broadly elliptic to suborbicular, 3–14 × 3–8(–12) cm, abaxially with longer hairs along veins, adaxially with appressed multicellular hairs, base cordate, margin sinuate-lobulate, apex rounded; lobules with broad triangular teeth; veins 6–8 pairs. Scapes 10–30 cm, fulvous villous; umbels 3–10, superimposed, 3–9-flowered, sometimes with flowers not in regular whorls and ± racemose; bracts linear to linear-lanceolate, 6–8 mm, pubescent. Flowers heterostylous. Pedicel 0.7–1.5 cm, fulvous pilose. Calyx narrowly campanulate, 5–6.5 mm, parted to middle, 5-veined; lobes narrowly lanceolate, sparsely pilose, apex acute. Corolla bright rose to deep purplish rose; limb ca. 1.5 cm wide; lobes obovate, 6–9 mm, deeply emarginate. Pin flowers: corolla tube 7–8 mm, slightly longer than calyx; stamens ca. 3 mm above base of corolla tube; style ca. 5 mm. Thrum flowers: corolla tube 9–10 mm; stamens ca. 3 mm below mouth of corolla tube; style reaching middle of tube. Capsule ellipsoid, slightly shorter than calyx. Fl. Apr.

* Open forests; 1800–2700 m. W Yunnan (Longling Xian, Tengchong Xian).

27. *Primula neurocalyx* Franchet, J. Bot. (Morot) 9: 449. 1895.

保康报春 bao kang bao chun

Primula baokongensis Chen & C. M. Hu; *P. malvacea* subsp. *rosthornii* (Diels) W. W. Smith & Forrest; *P. rosthornii* Diels.

Herbs perennial. Leaves in a rosette; petiole 3–7 cm, with dense tangled tawny hairs; leaf blade suborbicular to broadly ovate, 3–7 cm wide, abaxially with longer hairs along veins, adaxially sparsely pilose, base deeply cordate, margin sinuate-lobulate; lobules broadly triangular, margin irregularly dentate, apex obtuse. Scapes 4–18 cm, with dense tangled

tawny hairs; umbels 1 or 2, superimposed, 3–7-flowered; bracts linear-lanceolate, ca. 6 mm, pubescent. Flowers homostylous. Pedicel 0.8–1.5 cm, densely pilose. Calyx narrowly campanulate, 7–9 mm, sparsely pilose, parted to middle or slightly below; lobes oblong to oblong-lanceolate, 1.5–3 mm wide, herbaceous, ciliate. Corolla purplish rose; tube 7–8 mm, ca. as long as calyx; limb 1–1.2 cm wide; lobes obovate emarginate. Stamens at upper part of corolla tube. Style reaching stamens. Capsule unknown. Fl. May–Jul.

* Grassy slopes in mountain valleys; 1300–1600 m. NW Hubei, SE Gansu, E Sichuan.

Primula neurocalyx was erroneously reduced to *P. malvacea* by W. W. Smith and H. R. Fletcher. More recent additional material shows that the two species can easily be separated by the shape of the calyx lobes, which are oblong to oblong-lanceolate in *P. neurocalyx* and broadly ovate to elliptic in *P. malvacea*.

28. *Primula cinerascens* Franchet, J. Bot. (Morot) 9: 448. 1895.

灰绿报春 hui lu bao chun

Primula cinerascens subsp. *violodora* (Dunn) W. W. Smith & Forrest; *P. neurocalyx* Franchet subsp. *riparia* (I. B. Balfour & Farrer) W. W. Smith & Forrest; *P. riparia* I. B. Balfour & Farrer; *P. violodora* Dunn.

Herbs perennial. Leaves in a rosette; petiole 2–9 cm, with spreading long hairs; leaf blade broadly ovate to suborbicular, 1.5–6(–9) × 1.5–5.5(–8.5) cm, abaxially with thick grayish white multicellular hairs along veins, adaxially densely pubescent, base cordate, margin obscurely sinuate-lobulate, apex rounded; lobules subrounded, margin minutely denticulate. Scapes 8–25 cm, lanate basally, becoming puberulent apically; umbels 1(or 2), superimposed, 3–8(–10)-flowered; bracts linear-lanceolate, 3–6 mm. Flowers heterostylous. Pedicel 0.6–2.5 cm, glabrescent. Calyx narrowly campanulate, 4.5–7 mm, pubescent to subglabrous, parted to middle or slightly below; lobes lanceolate; veins 3. Corolla rose-purple to pink; tube 6.5–8 mm; limb 1.2–1.8 cm wide; lobes obovate, 6–9 mm, apex 2-cleft. Pin flowers: stamens near middle of corolla tube; style reaching top of tube. Thrum flowers with positions reciprocal. Capsule ovoid, shorter than calyx. Fl. Apr–May.

* Shaded moist areas on mountain slopes and in forests; 1500–2800 m. SE Gansu, W Hubei, E Sichuan.

29. *Primula violaris* W. W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 34: 85. 1944.

堇菜报春 jin cai bao chun

Herbs perennial. Leaves in a rosette; petiole 6–18 cm, densely fulvous pilose; leaf blade orbicular to broadly cordate or reniform, 4–13 × 5–15 cm, abaxially pilose along veins, otherwise subglabrous, adaxially pubescent, base deeply cordate, margin dentate-lobulate, apex rounded; lobules broadly triangular, margin denticulate. Scapes 20–40 cm, densely fulvous pilose; umbels 1 or 2, superimposed, 3–12-flowered; bracts linear to linear-lanceolate, 3–10 mm. Flowers heterostylous. Pedicel 1.5–2.5 cm, elongated to 3(–5) cm in

fruit, sparsely pilose or glabrescent. Calyx narrowly campanulate, 7–12 mm, glabrous or nearly so, parted to slightly below middle; lobes lanceolate; veins 3–5. Corolla rose-lilac to purple; tube 1–1.4 cm; limb 1.5–2 cm wide; lobes obovate, emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, included in calyx. Fl. May–Jun.

* Mountain forests; 1000–1500 m. W Hubei, SW Shaanxi.

30. *Primula polyneura* Franchet, J. Bot. (Morot) 9: 448. 1895.

多脉报春 duo mai bao chun

Primula cortusoides Linnaeus var. *lichiangensis* Forrest; *P. hymenophylla* I. B. Balfour & Forrest; *P. lichiangensis* (Forrest) Forrest; *P. lichiangensis* var. *halapa* I. B. Balfour & Forrest; *P. polyneura* subsp. *hymenophylla* (I. B. Balfour & Forrest) W. W. Smith & Forrest; *P. polyneura* subsp. *lichiangensis* (Forrest) W. W. Smith & Forrest; *P. polyneura* subsp. *sataniensis* (I. B. Balfour & Farrer) W. W. Smith & Forrest; *P. polyneura* subsp. *sikuensis* (I. B. Balfour & Farrer) W. W. Smith & Forrest; *P. polyneura* subsp. *veitchii* (Duthie) W. W. Smith & Forrest; *P. sataniensis* I. B. Balfour & Farrer; *P. saxatilis* V. Komarov var. *pubescens* Pax & K. Hoffmann; *P. sikuensis* I. B. Balfour & Farrer; *P. veitchii* Duthie.

Herbs perennial, densely or sparsely pilose, sometimes glabrous. Leaves in a rosette; petiole 5–10 cm; leaf blade broadly ovate to suborbicular, 2–10 cm, usually slightly wider than long, base cordate, palmately lobed to 1/4–1/2 its width; lobes broadly ovate to oblong, dentate to crenate, rarely subentire, apex rounded. Scapes 1–3.5(–10) cm; umbels 1 or 2, superimposed, 3–9(–12)-flowered; bracts lanceolate, 5–10 mm. Flowers heterostylous. Pedicel 0.5–2.5 cm. Calyx green or slightly tinged with purple, tubular, 5–12 mm, pubescent to glabrous, parted to middle or slightly below; lobes narrowly lanceolate; veins 3–5, distinct. Corolla pale rose to crimson, pubescent; tube 1–1.3(–1.4) cm; limb 1–1.5(–2) cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube or slightly exerted. Thrum flowers with positions reciprocal. Capsule ellipsoid, ca. as long as calyx. Fl. May–Jun, fr. Jul–Aug. $2n = 24^*$.

* Woodland margins, along valley streams; 2000–4000 m. SE Gansu, W Sichuan, SE Xizang, NW Yunnan.

Indumentum density is extremely variable in this species.

31. *Primula saxatilis* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 18: 429. 1901.

岩生报春 yan sheng bao chun

Herbs perennial. Leaves in a rosette; petiole 5–9(–15) cm, pilose; leaf blade broadly ovate to oblong-ovate, 2.5–8 × 2.5–6 cm, pubescent, base cordate, margin incised or pinnately lobulate, apex obtuse; lobules with triangular teeth. Scapes 10–25 cm, pilose or sometimes glabrescent toward apex; umbels 1 or 2, superimposed, 3–9(–15)-flowered; bracts linear to oblong-lanceolate, 3–8 mm, sparsely

pubescent. Flowers heterostylous. Pedicel 1–4 cm, pilose or pubescent. Calyx tubular-campanulate, 5–6 mm, sparsely pubescent or glabrous, parted to middle; lobes erect, lanceolate to oblong-lanceolate, conspicuously costate. Corolla rose-purple; tube 1.2–1.3 cm; limb 1.3–2.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens near middle of corolla tube; style exerted beyond annulus. Thrum flowers: stamens slightly below annulus; style reaching middle of corolla tube. Capsule oblong, slightly longer than calyx. Fl. May–Jun. $2n = 24^*$.

* Rock crevices, forests. Hebei, Heilongjiang, Shanxi.

32. *Primula sieboldii* E. Morren, Belgique Hort. 23: 97. 1873.

樱草 ying cao

Primula patens Turczaninow; *P. patens* var. *genuina* Skvortsov; *P. patens* var. *manshurica* Skvortsov; *P. sieboldii* E. Morren f. *patens* (Turczaninow) Kitagawa.

Herbs perennial. Leaves in a rosette; petiole 4–12(–18) cm, densely pilose; leaf blade ovate-oblong to oblong, 4–10 × (2–)3–7 cm, with grayish multicellular hairs, base cordate, rarely subrounded to truncate, margin crenate-lobulate, apex rounded; lobules crenulate-dentate. Scapes 12–25(–30) cm, pubescent; umbels 1, 5–15-flowered; bracts linear-lanceolate, 4–10 mm. Flowers heterostylous. Pedicel 0.4–3 cm, sparsely pubescent or glabrescent. Calyx campanulate, 6–8 mm, enlarged to 1.5 cm in fruit, parted to middle or above; lobes ± spreading, lanceolate to ovate-lanceolate, pubescent or glabrous. Corolla rose to lilac-purple, rarely white; tube 0.9–1.3 cm; limb 1–2(–3) cm wide; lobes obovate, apex 2-cleft. Pin flowers: stamens slightly below middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens near apex of corolla tube; style near middle of corolla tube. Capsule subglobose, ca. 1/2 as long as calyx. Fl. May, fr. Jun. $2n = 22, 24, 26, 29, 36$.

Wet areas in forests. Heilongjiang, Jilin, Liaoning, E Nei Mongol [Japan, Korea, Russia].

33. *Primula vaginata* Watt, J. Linn. Soc., Bot. 20: 4. 1882.

鞘柄掌叶报春 qiao bing zhang ye bao chun

Herbs perennial. Rhizomes creeping, comparatively thin, often with remains of old foliage. Leaves in a rosette; petiole 1–10(–18) cm, glabrous or puberulent, vaginate at base; leaf blade suborbicular, 1–5(–8) cm wide, abaxially glabrous or nearly so, adaxially pubescent or scabrous-puberulent, base deeply cordate, palmately divided 1/3–1/2 its width into 7–9 lobes; lobes deeply dentate. Scapes 3–12 (–30) cm, puberulent; umbels 1, 2–12-flowered; bracts linear lanceolate to elliptic, 3–7(–14) mm. Flowers heterostylous. Pedicel 5–10 mm, puberulent. Calyx campanulate, 3–5(–8) mm, puberulent or glabrous, parted to middle; lobes ovate to ovate-lanceolate, apex acute to obtuse, with 1 main vein. Corolla purplish pink; tube slightly longer to 2 × as long as calyx; limb 1–1.5 cm wide; lobes obovate, 2-lobed, lobules usually 2-toothed. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, ca. as long as calyx. Fl. Jun.

Moist rock crevices, forests, streamsides, moist meadows, on rocks; 2200–5000 m. Xizang, Yunnan [Bhutan, India, N Myanmar, Sikkim].

- 1a. Umbels compact, sometimes subcapitate; scapes 12–30 cm ... 33c. subsp. *normaniana*
1b. Umbels lax; scapes 3–12 cm.
2a. Scapes 2–9-flowered; corolla limb ca. 1 cm wide 33a. subsp. *vaginata*
2b. Scapes 1- or 2(or 3)-flowered; corolla limb 1–1.8 cm wide 33b. subsp. *eucyclia*

33a. *Primula vaginata* subsp. *vaginata*

鞘柄掌叶报春(原亚种) qiao bing zhang ye bao chun (yuan ya zhong)

Scapes 6–12 cm, usually much taller than leaf rosette; umbels 1, 2–9-flowered. Pedicel 5–10 mm. Corolla limb ca. 1 cm wide.

Moist rock crevices, forests, streamsides; ca. 3300 m. S Xizang [NE India].

33b. *Primula vaginata* subsp. *eucyclia* (W. W. Smith & Forrest) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 36. 1990.

圆叶报春 yuan ye bao chun

Primula eucyclia W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 41. 1923.

Scapes 3–6 cm, ca. as long as to slightly taller than leaf rosette, 1- or 2(or 3)-flowered. Pedicel 5–10 mm. Corolla limb 1–1.8 cm wide.

Moist meadows, on rocks; 3300–5000 m. SE Xizang, NW Yunnan [N Myanmar].

33c. *Primula vaginata* subsp. *normaniana* (Kingdon-Ward) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 36. 1990.

短梗鞘柄报春 duan geng qiao bing bao chun

Primula normaniana Kingdon-Ward, Ann. Bot. (Oxford) 44: 123. 1930.

Scapes 12–30 cm, much taller than leaf rosette; umbels compact, sometimes capitate, 4–12-flowered. Pedicel 3–6 mm. Corolla limb 1–1.5 cm wide.

Forests, streamsides; 2200–4000 m. SE Xizang [India].

34. *Primula latisecta* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 74. 1926.

宽裂掌叶报春 kuan lie zhang ye bao chun

Herbs perennial, with slender creeping rhizomes. Leaves in a rosette; petiole 5–14 cm, with dense fulvous multicellular hairs; leaf blade suborbicular, 4–8 cm wide, abaxially sparsely minutely glandular and pubescent mainly along veins, adaxially pilose, base deeply cordate, palmately 7-lobed to middle; lobes obovate, 3-lobulate, coarsely obtuse dentate. Scapes 7–20 cm, sparsely pilose; umbels 1, 2–4-flowered; bracts lanceolate, 4–8 mm. Flowers heterostylous.

Pedicel 1–1.5 cm, pilose. Calyx campanulate, 6.5–8.5 mm, sparsely pubescent, parted slightly below middle; lobes lanceolate, with midvein and 2 lateral veins. Corolla rose to purplish; tube 0.9–1.1 cm; limb 1.5–2 cm wide; lobes obovate, ca. 7 × 6 mm, emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style slightly exerted from tube. Thrum flowers: stamens slightly below annulus; style 2–3 mm. Capsule ellipsoid, ca. as long as calyx. Fl. May–Jun, fr. Sep. $2n = 22^*$.

* *Picea* and *Quercus* forests; 3100–3500 m. S Xizang.

35. *Primula palmata* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 61: 132. 1924.

掌叶报春 zhang ye bao chun

Herbs perennial, stoloniferous, with creeping rhizomes; stolons to 10 cm, internodes 1–5 cm, rooting at apex. Leaves in a rosette; petiole 2–19 cm, with fulvous long hairs; leaf blade suborbicular, 1.5–8 cm wide, abaxially pilose along veins, adaxially with multicellular hairs, base cordate, palmately lobed to 3/4 its width or more into 5–7 lobes; lobes 3-lobulate, segments with 1–3 acute teeth. Scapes slender, 4.5–17 cm, sparsely pilose; umbels 1, 1–4-flowered; bracts linear-lanceolate, 5–8 mm. Flowers heterostylous. Pedicel 0.7–2.5 cm, sparsely pubescent. Calyx campanulate, 5–7 mm, ± pilose, parted to 2/3; lobes lanceolate, 3-veined. Corolla rose or purplish; tube 8.5–11 mm; limb 1.5–2 cm wide; lobes broadly obovate, 5–8 mm wide, 2 lobules crenulate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule unknown. Fl. May–Jun.

* Woodland margins; 3000–3800 m. W Sichuan.

36. *Primula septemloba* Franchet, Bull. Soc. Bot. France 32: 265. 1885.

七指报春 qi zhi bao chun

Herbs perennial. Rhizomes with numerous fibrous roots. Leaves in a rosette; petiole 4–15 cm, densely fulvous pilose; leaf blade suborbicular, 5–10(–15) cm wide, abaxially with grayish long spreading hairs along veins, adaxially sparsely pilose, base deeply cordate, palmately lobed to 1/3 its width; lobes 7–9, broadly triangular, margin incised-dentate and irregularly denticulate, apex obtuse. Scapes 10–30(–50) cm, densely fulvous pilose; umbels 1(–3), superimposed, 3–6-flowered; bracts linear-lanceolate to narrowly oblong, 5–10 mm. Flowers drooping, homostylous. Pedicel 0.5–2 cm, densely glandular pubescent. Calyx usually tinged with purple, 5.5–8 mm, sparsely glandular pubescent or glabrescent, parted to middle or slightly below; lobes lanceolate, costate. Corolla deep purplish rose; tube 0.8–1.2 cm; limb 6–12 mm wide; lobes oblong-obovate, 4–5 × 2–4 mm, emarginate. Capsule elliptic, ca. as long as calyx. $2n = 24^*$.

* Woodlands, streamsides; 2400–4000 m. SW Sichuan, S Xizang, NW Yunnan.

- 1a. Stamens and stigma located near apex of corolla tube 36a. var. *septemloba*

- 1b. Stamens and stigma located at lower 1/2 of corolla tube 36b. var. *minor*

36a. *Primula septemloba* var. *septemloba*

七指报春(原变种) qi zhi bao chun (yuan bian zhong)

Calyx 5.5–8 mm. Corolla tube 1–1.2 cm. Stamens inserted toward apex of corolla tube. Style reaching stamens. Fl. May–Jul.

* Woodlands, streamsides; 2400–4000 m. SW Sichuan, NW Yunnan.

36b. *Primula septemloba* var. *minor* Kingdon-Ward, Ann. Bot. (Oxford) 44: 123. 1930.

小七指报春 xiao qi zhi bao chun

Calyx ca. 6 mm. Corolla tube ca. 8 mm. Stamens and style located at lower 1/2 of corolla tube. Fl. Jun.

* Rocks of forest understory; 3100–3400 m. S Xizang.

37. *Primula loeseneri* Kitagawa, Bot. Mag. (Tokyo) 50: 137. 1936.

肾叶报春 shen ye bao chun

Primula tyoseniana Nakai ex Kitagawa.

Herbs perennial. Leaves in a rosette; petiole 8–25(–30) cm, sparsely pilose; leaf blade reniform to suborbicular, 5–10(–15) × 5.5–13(–20) cm, sparsely pubescent or glabrous, or pubescent along veins only, base cordate, 7–9-lobulate, apex acutely dentate; lobules triangular. Scapes 25–50(–70) cm, sparsely pilose; umbels (1 or)2(–4), superimposed, 2–8-flowered; bracts linear-lanceolate, 4–9 mm. Flowers heterostylous. Pedicel 3–12 mm, elongated to 2 cm in fruit, pubescent. Calyx campanulate, 6–10 mm, puberulent, parted to middle or below; lobes lanceolate, apex apiculate. Corolla rose-purple; tube 1.2–1.3 cm; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style ca. 8 mm, reaching mouth of corolla tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 4 mm. Capsule ellipsoid, shorter than calyx. Fl. May.

Shaded moist areas in woodlands, shaded stream banks on mountain slopes; ca. 1000 m. Liaoning, E Shandong [Korea].

38. *Primula heucherifolia* Franchet, Bull. Soc. Bot. France 33: 65. 1886.

宝兴报春 bao xing bao chun

Primula gagnepainii Petitmengin; *P. lanata* Pax & K. Hoffmann.

Herbs perennial, stoloniferous. Rhizomes creeping. Leaves forming a rosette; petiole 3–15 cm, with dense fulvous multicellular hairs; leaf blade suborbicular, 2.5–9 cm wide or slightly wider than long, abaxially with long spreading hairs along veins, adaxially sparsely pilose, base deeply cordate, palmately lobed to 2/5, apex obtuse; lobes 7–11, ovate-deltoid, margin irregularly blunt dentate. Scapes 10–22(–30) cm, with dense fulvous multicellular hairs; umbels 1, 3–6(–9)-flowered; bracts linear-lanceolate, 3–8

mm, puberulent. Flowers heterostylous. Pedicel 1–2.5 mm, pubescent. Calyx campanulate, 5–7(–8) mm, puberulent or with few long hairs, parted to middle or below; lobes lanceolate to deltoid-ovate, with a conspicuous midvein and 2 lateral veins. Corolla mauve-pink to deep purple; tube 1–1.3 cm; limb 1.2–2 cm wide; lobes obovate, emarginate. Pin flowers: stamens near base of corolla tube; style slightly exerted from tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 3 mm. Capsule subglobose, shorter than calyx. $2n = 22^*$.

* Wet mossy rocks, woodland margins, streamsides; 2300–2700 m. W Sichuan.

39. *Primula alsophila* I. B. Balfour & Farrer in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 4. 1915.

蔓茎报春 man jing bao chun

Herbs perennial, stoloniferous. Rhizomes creeping, slender. Leaves 1–3, in a loose rosette; petiole 5–9(–11) cm, sparsely pilose; leaf blade suborbicular, 2–4(–6) × 2.5–5(–8) cm, abaxially with multicellular hairs along veins, ciliate, adaxially sparsely pilose, base deeply cordate, palmately lobed to 1/3 its width; lobes 5–7, margin usually acutely 3-toothed. Scapes 10–16 cm, sparsely pubescent; umbels 1, 2- or 3-flowered; bracts linear, 4–6 mm, ± pubescent. Flowers heterostylous. Pedicel 1–2.5 mm, pubescent. Calyx campanulate, 5–7 mm, glabrous or slightly puberulent, 5-veined; lobes spreading, lanceolate, 3–4 mm. Corolla lilac-rose to reddish purple; tube ca. 9 mm; limb 1–1.8 cm wide; lobes obovate, 6–8 × 5–6.5 mm, deeply emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, shorter than calyx. Fl. Jun–Jul.

* Margins of mountain woodlands; 2300–3300 m. SE Gansu, NW Sichuan.

40. *Primula geraniifolia* J. D. Hooker, Fl. Brit. India 3: 484. 1882.

滇藏报春 dian zang bao chun

Primula heucherifolia Franchet subsp. *humicola* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. humicola* I. B. Balfour & Forrest.

Herbs perennial, occasionally with stolons in leaf axils. Leaves 2–4, in a loose rosette petiole 4–13 cm, densely fulvous pilose; leaf blade orbicular, 3–8 cm wide, abaxially with spreading long hairs along veins, adaxially sparsely pilose, base deeply cordate, palmately lobed to 1/3–1/2 its width; lobes 7–9, 3-lobulate to 3-toothed, margin denticulate, apex acute. Scapes 10–30 cm, densely fulvous pilose; umbels 1, or occasionally 2, superimposed, 3–12-flowered; bracts linear-lanceolate to narrowly oblong, 5–8 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, elongated to 4 cm in fruit, puberulent. Calyx often tinged with reddish brown, campanulate, 5–10 mm, parted to middle; lobes lanceolate, with a prominent midvein and 2 lateral veins. Corolla rose to purple; tube 1.1–1.3 cm; limb 1–2 cm wide; lobes obovate, 6–8 × ca. 5 mm, emarginate. Pin flowers: stamens near base of corolla tube; style ca. as long as corolla

tube. Thrum flowers with positions reciprocal. Capsule ellipsoid, ca. as long as calyx. Fl. Jun–Jul, fr. Jul. $2n = 22$.

Margins of thickets and forests; 3000–4000 m. SE Xizang, NW Yunnan [Bhutan, NE India, Myanmar, Nepal, Sikkim].

41. *Primula bathangensis* Petitmengin, Bull. Herb. Boissier, S. 2, 8: 365. 1908.

巴唐报春 ba tang bao chun

Primula pintchouanensis Petitmengin; *P. racemosa* Bonati; *P. stephanocalyx* Handel-Mazzetti.

Herbs perennial. Leaves in a rosette; petiole 3–35 cm, with tawny or white, long hairs; leaf blade reniform, 3–12 × 2–14 cm, to 18 × 24 cm at fruiting, margin repand-crenate to lobulate and denticulate, abaxially with spreading multicellular hairs along veins, adaxially sparsely pilose, base deeply cordate. Scapes 10–70 cm, with tawny or white, long hairs; racemes lax; bracts 0.5–1.5 cm; lowest bracts elliptic, leaflike, gradually reduced upward, pubescent. Flowers heterostylous. Pedicel 0.5–1.5 cm, pubescent, elongated to 3 cm in fruit. Calyx widely campanulate, 7–10 mm, enlarged to 2 cm in fruit, herbaceous, pubescent, parted to 1/3–1/2; lobes ovate to triangular, margin entire to denticulate; veins prominent. Corolla yellow; tube 1–1.2 cm; limb 1.5–3 cm wide; lobes obovate, emarginate. Pin flowers: stamens ca. 4 mm above base of corolla tube; style ca. 8 mm. Thrum flowers: stamens toward apex of corolla tube; style ca. 4 mm. Capsule subglobose, 5–7 mm in diam. Fl. Jun–Jul.

* Rock crevices of mountain slopes, near streams; 2100–3000 m. W Sichuan, N Yunnan.

42. *Primula saturata* W.W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 34: 129. 1944.

黄葵报春 huang kui bao chun

Herbs perennial. Leaves in a rosette; petiole ca. 2.5 cm, with dense white multicellular hairs, narrowly winged proximally; leaf blade obovate to oblong, 3–6 × 2–3.5 cm, abaxially densely short hirsute, with longer white hairs along veins, adaxially copiously scurfy hirsute, base subattenuate or subrounded, margin sinuate-crenate, apex rounded. Scapes 16–20 cm, elongated to 40 cm in fruit, with dense white multicellular hairs. Racemes 1, 10–15-flowered; bracts lanceolate, 5–8 mm, pubescent. Flowers heterostylous. Pedicel 5–10 mm, densely pubescent. Calyx widely campanulate, 8–10 mm, pilose, glandular, parted nearly to middle; lobes ovate to triangular. Corolla bright yellow; tube ca. 1.4 cm; limb 2–2.5 cm wide; lobes obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style reaching annulus. Thrum flowers: stamens 8–9 mm above base of corolla tube; style ca. 5 mm. Capsule subglobose, slightly shorter than calyx, 5–7 mm in diam. Fl. Jul.

* Mixed forests, grassy slopes; 2100–4000 m. W Sichuan.

43. *Primula aromatica* W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 32. 1923.

香花报春 xiang hua bao chun

Herbs perennial. Rhizomes usually coated with withered remains of foliage at apex. Leaves in a rosette; petiole 2–5.5 cm, with white multicellular hairs, vaginate at base; leaf blade ovate-oblong to broadly ovate or suborbicular, 1.5–4 × 1.3–3.5 cm, membranous when dry, abaxially pubescent along veins, adaxially glabrescent or sparsely pilose, base shallowly cordate to subtruncate, 7–11-lobulate, apex rounded; lobules usually with 1 or 2 acute teeth. Scapes 5–12 cm, sparsely pilose; racemes 1, lax, 1–5-flowered; bracts linear, 5–7 mm, ± pubescent. Flowers heterostylous. Pedicel less than 2 mm. Calyx broadly campanulate, 4–6 mm, glandular pubescent outside, parted nearly to base; lobes lanceolate to oblong, leaflike, apex acute to obtuse. Corolla rose to pale bluish pink; tube yellow, 1.2–1.3 cm; limb 1.4–1.8 cm wide; lobes obovate, emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: stamens ca. 9 mm above base of corolla tube; style ca. 2 mm. Capsule subglobose, ca. 3 mm in diam. Fl. Jul–Aug.

* Limestone rock crevices; 2800–3300 m. NW Yunnan.

44. *Primula runcinata* C. M. Hu, Notes Roy. Bot. Gard. Edinburgh 41: 329. 1983.

芥叶报春 jie ye bao chun

Herbs perennial. Rhizomes with several fleshy roots. Leaves in a rosette; petiole winged, ca. as long as leaf blade, with white multicellular hairs; leaf blade elliptic to oblong-ob lanceolate, 5–10 × 1.5–5 cm, membranous when dry, abaxially sparsely pilose along midvein, adaxially glabrous, base attenuate, irregularly pinnate lobulate, apex subrounded; lobules oblong, 6–13 mm, lobed again or with 1 or 2 pairs of obtuse teeth. Scapes 10–35 cm, pubescent; racemes 1, lax, 2–13-flowered; bracts leaflike, oblong to oblanceolate, 5–10 mm. Flowers heterostylous. Pedicel 1–4 mm. Calyx campanulate, 4–6 mm, parted nearly to base; lobes ovate-lanceolate to linear, herbaceous, apex obtuse, sometimes denticulate. Corolla lilac; tube 1.2–1.3 cm; limb 1–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens ca. 9 mm above base of corolla tube; style 2–2.5 mm. Capsule globose, shorter than calyx. Fl. Jul, fr. Aug.

* Rocks in mountain woodlands; 3100–3200 m. N Yunnan (Zhongdian Xian).

45. *Primula malvacea* Franchet, Bull. Soc. Bot. France 33: 65. 1886.

葵叶报春 kui ye bao chun

Primula atrotubata W.W. Smith & Forrest; *P. barybotrys* Handel-Mazzetti; *P. langkongensis* Forrest; *P. malvacea* var. *alba* Forrest; *P. malvacea* var. *intermedia* W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1–22 cm, with dense white or fulvous multicellular hairs; leaf blade suborbicular to broadly ovate, 2.5–12 cm wide, abaxially pilose along veins, adaxially pubescent intermixed with long hairs, base cordate, margin crenate or crenate-lobulate, apex round-

ed; lobes irregularly denticulate. Scapes 3–40 cm, pilose. Inflorescences terminal, usually in 1–8 superimposed whorls, sometimes in pseudowhorls or a raceme; bracts leaflike, oblanceolate to broadly ovate, 0.5–2 cm. Flowers heterostylous. Pedicel 0.5–3.5 cm, copiously pubescent. Calyx broadly campanulate, 0.8–1.5 cm, enlarged to 2 cm in fruit, pubescent, parted to 1/3–2/3; lobes green, broadly ovate to elliptic, leaflike, margin entire to dentate, with prominent midvein and lateral veins. Corolla pale to dark rose, rarely white; tube 1–1.3 cm; limb 1.5–2.5 cm wide; lobes obovate, apex 2-cleft. Pin flowers: stamens at middle of corolla tube; style ca. 2/3 as long as tube. Thrum flowers: stamens in upper 1/2 of corolla tube; style ca. 1/3 as long as tube. Capsule globose, 3–6 mm in diam., shorter than calyx. Fl. Jul.

* Calcareous rocks of open slopes, forest margins; 2300–3700 m. NW Sichuan, N Yunnan.

46. *Primula blattariformis* Franchet, Gard. Chron., S開. 3, 1: 575. 1887.

地黄叶报春 di huang ye bao chun

Primula blattariformis subsp. *tenana* (Bonati ex I. B. Balfour) W. W. Smith & Forrest; *P. blattariformis* var. *duclouxii* Bonati; *P. microstachys* I. B. Balfour & Forrest; *P. tenana* Bonati ex I. B. Balfour.

Herbs perennial. Leaves in a rosette; petiole 0.6–6 cm, with dense long white hairs; leaf blade elliptic to obovate-elliptic, 2.5–14 × 1.5–10 cm, abaxially with white multicellular hairs along veins, adaxially pubescent to short pilose, base obtuse, subcuneate or subcordate, margin repand to crenate-lobulate with denticulate lobules, apex rounded. Scapes 10–55 cm, sparsely pilose; racemes 1, many flowered; bracts lanceolate, 4–10 mm, enlarged to 1.5 cm in fruit. Flowers heterostylous. Pedicel initially 4–8 mm, elongated to 1.5 cm in fruit, densely short hirsute. Calyx widely campanulate, 0.8–1.5 cm, slightly enlarged in fruit, parted to middle; lobes triangular to broadly ovate, leaflike, ciliate, pubescent, margin sometimes denticulate. Corolla pale or dark lavender-rose; tube 1–1.2 cm; limb 1.5–2.5 cm wide; lobes broadly obovate, 8–10 × 6–9 mm, deeply 2-lobed. Pin flowers: stamens ca. 5 mm above base of corolla tube; style slightly exserted. Thrum flowers: stamens near apex of corolla tube; style ca. 4 mm. Capsule globose, 5–7 mm in diam., shorter than calyx. Fl. Jul.

* Thickets, margins of mountain woodlands; 2000–3700 m. SW Sichuan, N and W Yunnan.

47. *Primula celsiiformis* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 7. 1915.

显脉报春 xian mai bao chun

Primula racemosa H. L 関eill_.

Herbs perennial. Leaves in a rosette; petiole 4–15 cm, densely short hirsute and short-stalked glandular; leaf blade oblong to oblong-elliptic, 4–10 × 2–5 cm, abaxially copiously fulvous short hirsute, adaxially short hirsute intermixed with long white hairs, base cordate to subcordate, margin repand-

crenate with obscure denticulate crenations, apex rounded to obtuse; reticulate veins elevated abaxially. Scapes 30–40 cm, densely short hirsute and short-stalked glandular; racemes 1, elongated many flowered; bracts linear to lanceolate or oblanceolate, 4–6 mm, enlarged to 1.2 cm in fruit, glandular pubescent. Flowers heterostylous. Pedicel 0.7–1.5 cm, elongated to 2 cm in fruit, densely scurfy short pubescent. Calyx broadly campanulate, 7–8 mm, enlarged to 2 cm in fruit, densely short hirsute, glandular, parted ± to middle; lobes broadly triangular to ovate, leaflike, with elevated veins. Corolla violet; tube ca. 1.2 cm, short glandular pubescent outside; limb 1.3–2.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style 7–8 mm. Capsule subglobose, 4–5 mm in diam. Fl. May.

* Mountains, rock crevices; 600–2500 m. SW Sichuan, NE Yunnan.

48. *Primula filchnerae* R. Knuth, Bot. Jahrb. Syst. 36, Beibl. 82: 139. 1905.

陕西羽叶报春 shaan xi yu ye bao chun

Herbs perennial, pilose, glandular. Leaves in a rosette; petiole ca. as long as leaf blade, dilated at base; leaf blade ovate to ovate-oblong, 3.5–6 × 3–4 cm, pinnatisect; pinnae 3 or 4 pairs, 0.8–2.5 cm, margin coarsely dentate to pinnatifid; segments sublinear, 2–3 mm wide, margin serrate. Scapes 7–15 cm; umbels 1, occasionally another smaller superimposed, 3–8-flowered; bracts linear-lanceolate, 8–10 mm. Pedicel 1.2–2 cm. Calyx campanulate, 8–10 mm, parted ca. to 2/5; lobes triangular-lanceolate, apex acute. Corolla purple; tube slightly longer than calyx; limb 1.8–2.5 mm wide; lobes broadly ovate, deeply emarginate. Capsule unknown. Fl. Feb.

* S Shaanxi, Sichuan (cultivated).

Primula filchnerae was collected only once by Filchner. The type material in the Berlin Herbarium was lost during the Second World War. A cultivated plant that matches this species in all respects was recently found in Sichuan; the calyx is campanulate, but the base is inflated after anthesis. There is no doubt of its affinity with *Primula sinensis* Sabine ex Lindley.

49. *Primula rupestris* I. B. Balfour & Farrer in I. B. Balfour, Trans. Bot. Soc. Edinburgh 27: 240. 1917.

巴蜀报春 ba shu bao chun

Primula calciphila Hutchinson.

Herbs perennial. Rhizomes thick, with dry petioles of old leaves at apex. Leaves in a rosette; petiole 4–13 cm, with copious multicellular white hairs, vaginate at base; leaf blade ovate-rotund to ovate-elliptic, 2–5 × 2–5 cm, base cordate to subtruncate, palmately lobed to 1/3–2/5 or more its width, apex rounded, sparsely white pilose; lobes oblong to subrounded, margin subentire or crenate-dentate. Scapes 4–15 cm, with copious multicellular white hairs; umbels 1, 3–8-flowered, occasionally with a superimposed, 2- or 3-flowered umbel; bracts linear to linear-lanceolate, 5–12 mm, glandular pubescent. Flowers heterostylous. Pedicel 2–4 cm, densely glandular pilose. Calyx 5–8 mm, enlarged to 1 cm

in fruit, inflated at base, subglobose or conical, pubescent, parted to 1/3 or nearly to middle; lobes triangular, margin entire, apex acute or subobtuse. Corolla rose to pale lilac or nearly white; tube 2–3 × as long as calyx, glandular pubescent outside; limb 2–3 cm wide; lobes obovate, apex 2-cleft. Pin flowers: stamens below middle of corolla tube; style ca. 2/3 as long as tube. Thrum flowers: stamens at middle of corolla tube; style in lower 1/3 of tube, shorter than calyx. Capsule globose, 5–6 mm in diam., shorter than calyx. Fl. Feb–Mar. $2n = 24^*$.

* Dry limestone cliffs; ca. 500 m. W Hubei, S Shaanxi.

50. *Primula sinensis* Sabine ex Lindley, Coll. Bot. t. 7. 1821.

藏报春 zang bao chun

Auganthus praenitens Link; *Oscaria chinensis* Lilja; *Primula mandarina* Hoffmannsegg; *P. praenitens* (Link) Ker Gawler; *P. semperflorens* Loiseleur-Deslongchamps ex Steudel; *P. sertulosa* J. Kickx; *Primulidium sinense* (Sabine ex Lindley) Spach.

Herbs perennial, with copious multicellular hairs, usually without remains of old leaves at base. Leaves in a rosette; petiole 10–20 cm, succulent, vaginate at base; leaf blade broadly ovate to subrotund, 4–12 cm wide, base cordate, palmately lobed to 1/2 its width; lobes 7–9, oblong to ovate, margin coarsely dentate to incised-lobulate; lobules serrate. Scapes 10–30 cm; umbels 1 and terminal, or 2 or 3 superimposed, 3–12-flowered; bracts lanceolate to oblong-lanceolate, 1–3 cm. Flowers heterostylous. Pedicel 2–5(–7) cm. Calyx 0.8–1.5 cm, enlarged to 2 cm in fruit, inflated at base, subglobose, parted to 1/3–2/5; lobes ovate-triangular, often with unequal teeth, apex acute. Corolla pink to rose or lilac; tube slightly longer than calyx, pubescent outside; limb 1.5–4 cm wide; lobes broadly obovate, emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, 8–9 mm in diam., shorter than calyx. Fl. Dec–Feb. $2n = 22^*$, 24^* , 36^* , 48^* .

* Shaded areas in ravines, mixed forests; ca. 1000 m. Guizhou (Anshun Xian), Sichuan (Emei Shan).

51. *Primula pycnoloba* Bureau & Franchet, J. Bot. (Morot) 5: 99. 1891.

密裂报春 mi lie bao chun

Herbs perennial. Rhizomes with numerous fibrous roots. Leaves in a rosette; petiole slightly shorter to ca. as long as leaf blade, densely white or brownish lanate; leaf blade broadly ovate to suborbicular, 4–15 cm wide, abaxially with multicellular hairs along veins, adaxially appressed pilose, base shallowly to deeply cordate, margin crenate or sinuate-lobulate with irregularly denticulate lobules, apex rounded. Scapes 7–18(–20) cm, densely white or brownish lanate, with a short raceme; bracts lanceolate to oblanceolate, 0.7–2 cm × 3–5 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, villous. Calyx campanulate to narrowly campanulate, 1.5–2.5 cm, villous, parted to middle; lobes lanceolate, ciliate, apex acute. Corolla pale yellow, enclosed in enlarged calyx; limb 7–8

mm wide; lobes oblong to elliptic, ca. 3 × 2 mm, apex slightly emarginate. Pin flowers: corolla tube 1.3–1.5 cm; stamens at middle of corolla tube; style slightly shorter than tube. Thrum flowers: corolla tube 1.8–2 cm; stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule subglobose, ca. 5 mm in diam., included in calyx. Fl. May, fr. Jun–Jul. $2n = 24^*$.

* Grassy slopes, margins of mountain woodlands; 1600–2000 m. W Sichuan.

52. *Primula cicutariifolia* Pax, Jahresber. Schles. Ges. Vaterl. Cult. 93: Abt. 2, 1. 1915.

毛茛叶报春 mao gen ye bao chun

Primula erodioides Schlechter; *P. ranunculoides* Chen; *P. ranunculoides* var. *minor* Chen.

Herbs perennial, delicate, glabrous, with a taproot and numerous fibrous roots. Leaves dimorphic; outer leaves withered at anthesis, long petiolate, ovate, 3–8 × 3–7 mm, margin entire to dentate; petiole of inner leaves 0.6–2 cm; leaf blade elliptic to oblong, 1.5–10 cm; pinnatisect; pinnae (1 or)2–6 pairs, proximal pair very small, 3–13 × 2.5–12 mm, 2–4-toothed on each side, terminal pair larger, elliptic to broadly ovate, usually 3-lobed. Scapes 1–5 cm; umbels 1, (1 or)2–4-flowered; bracts linear, 1.5–3 mm. Flowers homostylous or heterostylous. Pedicel 0.7–3 cm, sparingly glandular. Calyx campanulate, 3–4.5 mm, ± glandular, parted below middle into lanceolate lobes. Corolla pink or pale lilac; tube 4.5–6.5 mm; limb 4–8 mm wide; lobes cuneate-oblong, apex subtruncate or slightly emarginate. Pin flowers unknown. Thrum flowers: stamens near apex of corolla tube; style ca. 1/2 as long as tube. Homostylous flowers with stamens and style near apex of corolla tube. Capsule subglobose, ca. 2.5 mm in diam. Fl. Mar–Apr, fr. Apr–May.

* Wet moss-covered rocks in woodlands and along streamsides; 500–1000 m. S Anhui, E Hubei, Hunan, N Jiangxi, N Zhejiang.

53. *Primula merrilliana* Schlechter, Repert. Spec. Nov. Regni Veg. 19: 384. 1924.

安徽羽叶报春 an hui yu ye bao chun

Herbs perennial, dwarf, glabrous. Leaves 10–20, in an open rosette; petiole slightly flattened, 0.5–2.5(–3) cm; leaf blade pinnatisect, 2–6 × 0.7–1.5 cm; pinnae 7–9 pairs, oblong, 3–9 mm, margin pinnatifid or pinnately dentate; segments linear, 0.4–0.8 mm wide, apex acute. Scapes 3–7 cm; umbels 1 or 2, superimposed, 2- or 3-flowered; bracts linear to narrowly triangular, 1.5–3.5 mm, tapered from a wide base. Flowers heterostylous. Pedicel 1.5–3 cm. Calyx campanulate, ca. 4.5 mm, sparingly glandular, parted to middle; lobes ovate-lanceolate, apex acute; veins 3. Corolla white or tinged with lilac; tube 5–6.5 mm; limb 1–1.2 cm wide; lobes obovate-elliptic to obovate-oblong, ca. 7 × 4 mm, margin entire, apex rounded. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 2 mm. Capsule subglobose, ca. 3 mm in diam. Fl. May, fr. May–Jun.

* Grassy areas in ravines; 800–1100 m. S Anhui (Huang Shan, Shexian Xian).

54. *Primula veris* Linnaeus subsp. **macrocalyx** (Bunge) Lüdi, Ill. Fl. Mitt.-Eur. 5: 1753. 1927.

硕萼报春 shuo e bao chun

Primula macrocalyx Bunge in Ledebour, Fl. Altaic. 1: 209. 1829; *P. inflata* Lehmann subsp. *macrocalyx* (Bunge) O. Schwarz; *P. officinalis* (Linnaeus) Hill var. *macrocalyx* (Bunge) C. Koch.

Herbs perennial. Leaves in a rosette; petiole winged, usually 1/3–1/2 or rarely ca. as long as leaf blade; leaf blade ovate-oblong to oblong, 11–14 × 2–2.7 cm, to 20 cm at fruiting, abaxially densely short pubescent, adaxially sparsely strigillose, base attenuate, margin irregularly crenate to dentate, apex rounded to obtuse. Scape 12–35 cm, short pubescent; umbels 1, 3–15-flowered; bracts linear-lanceolate, 4–10 mm. Flowers heterostylous. Pedicel 0.4–2 cm, elongated to 2.6 cm in fruit, densely pubescent. Calyx tubular-campanulate, 0.5–2 cm, copiously pubescent, parted to 1/3, 5-veined; lobes triangular, apex acute or subacuminate. Corolla yellow; tube ca. as long as calyx; limb 1.8–2.8 cm wide; lobes obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule ellipsoid, ca. 1/2 as long as calyx. Fl. May–Jun, fr. Jul–Aug. $2n = 22$.

Grassy areas on N-facing slopes; 1500–2000 m. NW Xinjiang [Kazakstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

Primula veris subsp. *veris* is distributed from C and S Europe eastward to the Crimea. It can be distinguished by its smaller calyx (0.8–1.5 cm) and corolla (0.9–1.2 cm in diam.).

55. *Primula henryi* (Hemsley) Pax in Engler, Pflanzenr. IV. 237(Heft 22): 47. 1905.

滇南报春 dian nan bao chun

Carolinella henryi Hemsley, Hooker's Icon. Pl. 8: t. 2726. 1902.

Herbs perennial, glabrous. Rhizomes to 2 cm in diam., with fibrous roots. Leaves 2 or 3 per rosette; petiole 10–18 cm; leaf blade broadly ovate to ovate-lanceolate or ovate-elliptic, 10–20 × 3.5–12 cm, subleathery when dry, base rounded or subcuneate, margin spiny dentate, often with 1 or 2 lobules toward apex, apex acuminate. Scapes 15–21 cm; racemes abbreviated, 10–25-flowered; axis initially very short, to 1–1.5 cm in fruit; bracts linear, 3–5 mm. Flowers secund. Pedicel erect, 5–10 mm. Calyx campanulate, ca. 3 mm, parted to 1/3; lobes triangular, apex acute. Corolla ?pink; tube ca. 7 mm; limb 1–1.2 cm wide; lobes oblong-obovate, 4–4.5 × ca. 3 mm, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style exerted. Thrum flowers unknown. Capsule ellipsoid, slightly longer than calyx, narrowed toward apex into a beak.

Wet areas in broad-leaved evergreen forests; 1600–1700 m. SE Yunnan (Malipo Xian, Pingbian Xian) [N Vietnam].

56. *Primula chapaensis* Gagnepain, Bull. Soc. Bot. France 76: 139. 1929.

马关报春 ma guan bao chun

Primula huana W.W. Smith.

Herbs perennial. Rhizomes with dense tawny crisped hairs at apex. Leaves usually 2 per plant; petiole 15–30 cm, glabrous except at base; leaf blade ovate to elliptic-ovate, 10–21(–30) × 8–16(–21.5) cm, thin papery when dry, glabrous or ± scurfy abaxially, base cordate, margin regularly denticulate, apex short acuminate. Scapes 20–30 cm, with dense rust-colored crimped hairs at base and toward apex, otherwise subglabrous. Racemes abbreviated, ± umbellate, 8–28-flowered; bracts linear-lanceolate, 7–10 mm. Flowers heterostylous. Pedicel 1.5–2 cm, densely rust-colored pilose. Calyx campanulate, 7–10(–12) mm, enlarged to 1.4 cm in fruit, glandular pubescent outside, prominently 10-veined; lobes ovate, 1–3 mm. Corolla rose; tube 1–1.2 cm; limb 1.2–1.5 cm wide; lobes obovate, 4–5 mm, emarginate. Pin flowers: stamens ca. 5 mm above base of corolla tube; style ca. 8 mm. Thrum flowers: stamens in upper part of corolla tube; style ca. 4 mm. Capsule obovoid, ca. 6 mm, operculate. Fl. Mar.

Open limestone hills; ca. 1700 m. S Yunnan (Maguan Xian) [N Vietnam].

57. *Primula partschiana* Pax in Engler, Pflanzenr. IV. 237(Heft 22): 45. 1905.

心叶报春 xin ye bao chun

Carolinella cordifolia Hemsley; *Primula cyclaminifolia* Franchet ex Petitmengin.

Herbs perennial. Rhizomes creeping, to 4 cm, with a tuft of long roots. Leaves 2 or 3 per rosette; petiole 15–20 cm, initially rust-colored glandular pubescent, glabrescent; leaf blade oblong to suborbicular or ovate-rotund, 11–20 × 10–15 cm, papery when dry, abaxially pubescent along veins or glabrescent, adaxially glabrous, base deeply cordate, margin obscurely repand and spiny-denticulate, apex rounded or short obtuse. Scapes 10–20 cm, rust-colored tomentose especially at base, axis 3–10 mm initially, elongated to 5 cm in fruit. Racemes abbreviated, ± umbellate, 8–15-flowered; bracts linear to linear-lanceolate, 6–10 mm. Flowers heterostylous. Pedicel 7–10 mm, elongated slightly in fruit. Calyx tinged with red, campanulate, 4.5–5 mm, glabrous or very sparsely puberulent, parted to middle, sinus between lobes rounded, obscurely 5-veined; lobes lanceolate, apex acute. Corolla rose; tube 1–1.2 cm; limb 1–1.5 cm wide; lobes obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule ellipsoid, slightly longer than calyx. Fl. Mar–Apr.

* Broad-leaved forests; 2300–2400 m. SE Yunnan (Jinping Xian).

58. *Primula rugosa* N. P. Balakrishnan, J. Bombay Nat. Hist. Soc. 67: 63. 1970.

倒卵叶报春 *dao luan ye bao chun*

Carolinella obovata Hemsley; *Primula obovata* (Hemsley) Pax (1903), not Duby (1844), not Huter (1873).

Herbs perennial. Rhizomes short, with numerous fibrous roots. Leaves 3–6 per plant; petiole 0.5–5 cm, narrowly winged, sparsely pubescent initially, glabrescent; leaf blade oblong to oblong-obovate, 4–10(–14) × 2–5 cm, papery, base broadly cuneate to subrounded, rarely shallow cordate, margin repand-crenate, apex rounded; reticulate veins elevated, especially adaxially. Scapes 5–18 cm, initially scurfy-pubescent, later with hairs only at base and toward apex. Racemes abbreviated, ± umbellate, 8–12-flowered; bracts linear to narrowly lanceolate, 3–5 mm. Flowers heterostylous. Pedicel 5–10 mm, glabrous. Calyx campanulate, 3–4 mm, parted to middle, 5-veined; lobes narrowly triangular, apex acute. Corolla rose; tube 6–8 mm; limb 1–1.2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule obovoid, operculate. Fl. Mar–Apr.

* Wet rocks in forests; 1100–1900 m. SE Yunnan (Pingbian Xian).

59. *Primula levicalyx* C. M. Hu & Z. R. Xu, *Acta Phytotax. Sin.* 26: 309. 1988.

光萼报春 *guang e bao chun*

Herbs perennial. Rhizomes short, with a tuft of fibrous roots. Leaves in a rosette; petiole 2–5 cm, usually longer than leaf blade, densely pilose; leaf blade oblong to broadly ovate, 1.5–3.5 × 0.8–2.5 cm, papery when dry, abaxially copiously short glandular pilose, adaxially pilose, base cordate, rarely subrounded, margin remotely hydathode-denticulate, apex rounded. Scapes 2.5–5.5 cm, sparsely pilose; umbels 1, 2–6-flowered; bracts linear-lanceolate, 2–3 mm. Flowers heterostylous. Pedicel 4–10 mm, sparsely short-stalked glandular. Calyx campanulate, 3.5–4 mm, ± glandular, parted to middle; lobes narrowly triangular, margin hydathode-apiculate, with a prominent midvein and 2 lateral veins. Corolla rose; tube ca. 8 mm; limb 1–1.2 cm wide; lobes obovate, deeply emarginate. Pin flowers unknown. Thrum flowers: stamens in upper 1/3 of corolla tube; style ca. 3 mm. Capsule obovoid, operculate. Fl. Apr.

* Limestone rock crevices; ca. 900 m. S Guizhou (Libo Xian).

60. *Primula kweichouensis* W. W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 16: 225. 1931.

贵州报春 *gui zhou bao chun*

Herbs perennial. Leaves in a rosette; petiole 0.5–2.5 cm, rust-colored pilose; leaf blade obovate to broadly elliptic, 1–4.5 × 1–2.5 cm, ciliate, papery, abaxially pilose, adaxially glabrous or slightly puberulent, base broadly cuneate to rounded, margin subentire to remotely hydathode-denticulate, apex rounded, sometimes slightly emarginate. Scapes 2–3.5 cm, rust-colored pilose; umbels 1, 2- or 3-flowered; bracts linear to linear-lanceolate, 1–3 mm, ± pubescent. Flowers heterostylous. Pedicel 0.7–1.5 cm, rust-colored pilose. Calyx

campanulate, 3–4 mm, sparsely pubescent, parted to 2/3; lobes lanceolate, ciliate, apex acute. Corolla rose; tube 7–8 mm; limb 5–10 mm wide; lobes obovate, emarginate. Thrum flowers: stamens 5–6 mm above base of corolla tube; style ca. 2.5 mm. Capsule obovoid, operculate.

* Limestone rocks and cliffs. Guizhou (Xingyi Xian).

- 1a. Petiole 0.5–2.5 cm, much shorter than leaf blade 60a. var. *kweichouensis*
1b. Petiole 1.5–5 cm, longer than leaf blade 60b. var. *venulosa*

60a. *Primula kweichouensis* var. *kweichouensis*

贵州报春(原变种) *gui zhou bao chun* (yuan bian zhong)

Petiole 0.5–2.5 cm; leaf blade much longer than petiole, abaxially sparsely rust-colored pubescent along veins. Fl. Jan.

* Limestone rocks. W Guizhou (Xingyi Xian).

60b. *Primula kweichouensis* var. *venulosa* C. M. Hu in Chen & C. M. Hu, *Fl. Reipubl. Popularis Sin.* 59(2): 290. 1990.

多脉贵州报春 *duo mai gui zhou bao chun*

Petiole 1.5–5 cm; leaf blade 1/2 to ca. as long as petiole, abaxially densely pilose. Fl. Apr.

* Limestone cliffs. N Guizhou (Suiyang Xian).

61. *Primula kwangtungensis* W. W. Smith, *Sunyatsenia* 3: 244. 1937.

广东报春 *guang dong bao chun*

Herbs perennial. Leaves in a rosette; petiole 0.5–3 cm, densely rust-colored pilose; leaf blade broadly obovate to oblong or elliptic, 5–11.5 × 3–7.5 cm, long ciliate, thin papery, abaxially with rust-colored multicellular hairs along veins, adaxially pubescent along midvein when young, soon glabrescent, base broadly cuneate to subrounded, margin subentire to remotely denticulate, apex rounded. Scapes 3–12 cm, rust-colored pilose; umbels 1 or 2, superimposed, 3–9-flowered; bracts lanceolate to oblong-lanceolate, 4–5 mm, ± pubescent. Flowers heterostylous. Pedicel 1–1.5 mm, rust-colored pilose. Calyx campanulate, 6–7 mm, pubescent or subglabrous, parted to 1/3; lobes triangular, apex acute. Corolla rose or purplish blue; tube 1.1–1.3 cm; limb ca. 1.5 cm wide; lobes obovate, 6–8 mm, deeply emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule ellipsoid, slightly shorter than calyx. Fl. Feb–Mar.

* Wet rocks in woodlands; ca. 200 m. N Guangdong (Lechang Xian, Ruyuan Xian).

62. *Primula wangii* Chen & C. M. Hu, *Fl. Reipubl. Popularis Sin.* 59(2): 291. 1990.

广南报春 *guang nan bao chun*

Herbs perennial. Leaves in a rosette; petiole 2.5–8 cm, usually ca. as long as leaf blade, densely rust-colored pilose;

leaf blade broadly oblong to suborbicular, 3–6.5 × 2.5–5 cm, long ciliate, papery, abaxially rust-colored pubescent along veins, adaxially glabrous or sparsely pubescent along impressed midvein, base cordate to orbicular, slightly asymmetrical, margin entire to obscurely repand and remotely hydathode-denticulate, apex rounded, sometimes slightly emarginate. Scapes 2.5–8 cm, elongated to 12 cm in fruit, densely rust-colored pilose; umbels 1, 3–5-flowered; bracts linear-lanceolate, 2–3 mm, ± pubescent. Flowers heterostylous. Pedicel (0.5–)1–2.5 cm, rust-colored pilose. Calyx campanulate, 4.5–7.5 mm, sparsely pubescent, parted to middle; lobes lanceolate, sparingly ciliate, with a prominent midvein. Corolla rose; tube ca. 1 cm; limb 1–1.5 cm wide; lobes obovate, apex 2-cleft. Thrum flowers: stamens 7–8 mm above base of corolla tube; style 3–3.5 mm. Capsule cylindrical, slightly longer than calyx. Fl. Mar.

* Limestone hills. W Guangxi, SE Yunnan.

63. *Primula bullata* Franchet, Bull. Soc. Bot. France 32: 265. 1885.

皱叶报春 zhou ye bao chun

Herbs perennial. Rhizomes woody, simple or with 1 or 2 branches, with remains of old foliage at apex. Leaves in a rosette; petiole 1–8(–10) mm, pubescent; leaf blade elliptic-oblong to oblanceolate, 3–10(–15) × 1–4.2 cm, base cuneate-attenuate, margin repand-crenate, apex subrounded. Leaves of current year thin papery, puberulent, usually efarinose. Leaves of previous year thicker, bullate, abaxially densely yellow farinose. Scapes 4–20 cm, ± yellow farinose toward apex; umbels 1, 6–15(–20)-flowered; bracts lanceolate, 0.8–1.5 cm × 1–3 mm, leaflike. Flowers heterostylous. Pedicel 1–2 cm, yellow farinose. Calyx tubular-campanulate, 8–10 mm, yellow farinose, parted 1/3–1/2; lobes lanceolate to ovate-oblong, apex acute to obtuse. Corolla deep yellow; tube slightly longer than calyx; limb 1.2–1.8 cm wide; lobes obovate to suborbicular, apex 2-cleft. Pin flowers: stamens 4–5 mm above base of corolla tube; style ca. 9 mm. Thrum flowers: stamens toward apex of corolla tube; style less than 1/2 as long as tube. Capsule subglobose, shorter than calyx. Fl. May–Jun, fr. Jul–Aug.

* *Pinus* and *Quercus* forests; ca. 3000 m. Yunnan (Eryuan Xian, Heqing Xian).

64. *Primula forrestii* I. B. Balfour in Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 215. 1908.

灰岩皱叶报春 hui yan zhou ye bao chun

Primula bullata Franchet var. *rufa* (I. B. Balfour) W.W. Smith & H. R. Fletcher; *P. redolens* I. B. Balfour & Kingdon-Ward; *P. rufa* I. B. Balfour.

Herbs perennial. Rhizomes woody, with remains of old leaves at apex. Leaves in a rosette; petiole 2–10 cm, fulvous pilose; leaf blade ovate-elliptic to elliptic-oblong, 3–8 × 2–5 cm, occasionally to 12 × 6 cm at fruiting, fulvous pilose, base broadly cuneate to obscurely cordate, margin crenate to blunt dentate, apex rounded to obtuse; leaves of previous year thicker, bullate, abaxially yellow farinose. Scapes 7–25 cm, glandular tawny pubescent. Inflorescences umbellate, fulvous

pilose, 7–18(–25)-flowered; bracts broadly lanceolate, 1–3 cm, leaflike. Flowers heterostylous. Pedicel initially slightly shorter than bracts, elongated to 4 cm in fruit. Calyx subtubular, 1.2–1.5 cm, pilose, farinose near base of interior, parted to ca. 1/3; lobes ovate-oblong, apex subrounded to obtuse. Corolla deep golden yellow, exannulate; tube slightly longer than calyx; limb 1.5–2.5 cm wide; lobes broadly obcordate to suborbicular, 2-cleft at apex. Pin flowers: stamens 5–6 mm above base of corolla tube; style ca. 9 mm. Thrum flowers: stamens ca. 9 mm above base of corolla tube; style ca. 2.5 mm. Capsule ovoid, shorter than calyx. Fl. Apr–May. $2n = 24^*$.

* Open mountain forests, limestone rock crevices; 3000–3200 m. N and W Yunnan.

65. *Primula bracteata* Franchet, Bull. Soc. Bot. France 32: 266. 1885.

小苞报春 xiao bao bao chun

Primula articulata W. W. Smith; *P. articulata* var. *sublinearis* W.W. Smith; *P. dubernardiana* Forrest; *P. henricii* Bureau & Franchet; *P. monbeigii* I. B. Balfour; *P. pseudobracteata* Petitmengin; *P. pulvinata* I. B. Balfour & Kingdon-Ward; *P. tapeina* I. B. Balfour & Forrest; *P. ulophylla* Handel-Mazzetti.

Herbs perennial, caespitose. Rhizomes woody, to 15 cm, often branched, with remains of old leaves at apex. Leaves in a rosette; petiole ca. as long as leaf blade, pilose; leaf blade elliptic to narrowly oblong or oblanceolate, 1–7 × 0.5–3 cm, abaxially with multicellular hairs, efarinose or yellow or cream farinose, adaxially ± glandular pubescent, base attenuate, margin obscurely crenate, apex rounded to obtuse. Scapes to 5 cm, pilose; umbels 2–10-flowered, if scapes obsolete then 1-flowered; bracts lanceolate to linear, 0.5–1.5(–2) cm, apex acute. Flower heterostylous. Pedicel divaricate, 0.8–2.5 cm. Calyx campanulate, 5–14 mm, glandular pubescent, efarinose or farinose, parted to middle or slightly below; lobes ovate-oblong to lanceolate, apex acute to obtuse. Corolla yellow, white, or pale purple; tube 1.5–2 × as long as calyx; limb 1–2 cm wide; lobes obovate, emarginate or 2-cleft at apex. Pin flowers: stamens in upper 1/2 of corolla tube; style ca. 3/4 as long as tube. Thrum flowers: stamens inserted 7–8 mm above base of corolla tube; style ca. 3 mm. Capsule subglobose, included in calyx. Fl. Mar–May.

* Rock crevices; 2500–3500 m. SW Sichuan, E Xizang, N and W Yunnan.

66. *Primula rockii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 16: 224. 1932.

纤柄皱叶报春 xian bing zhou ye bao chun

Herbs perennial. Rhizomes woody, with brownish scales and remains of old leaves at apex. Leaves in a rosette; petiole 1–7 cm, pilose; leaf blade broadly ovate to ovate-oblong, 1–3(–4) × 0.5–2.5(–3) cm, ciliate, abaxially with dense multicellular hairs, adaxially less densely so, base truncate to shallowly cordate, incised-lobulate, apex subrounded to obtuse; lobes with 1 or 2 blunt teeth on each side. Scapes inconspicuous or to 2.5 cm, pilose; umbels 1, 2–6-flowered;

bracts lanceolate, 7.5–10 mm. Flowers heterostylous. Pedicel 2–4 cm, glandular tawny pubescent. Calyx tubular to campanulate, 7–10 mm, glandular pubescent, parted to middle; lobes lanceolate, apex acute to obtuse. Corolla yellow, pubescent outside; tube ca. 1.5 × as long as calyx; limb ca. 1.5 cm wide; lobes obovate to subrounded, 2-cleft or irregularly crenate at apex. Pin flowers: stamens ca. 3.5 mm above base of corolla tube; style ca. 6 mm. Thrum flowers: stamens in upper 1/3 of corolla tube; style ca. 1.5 mm. Capsule globose, shorter than calyx. Fl. Jun.

* Limestone rock crevices; 3000–4400 m. SW Sichuan (Muli Xian), NW Yunnan (Weixi Xian).

67. *Primula chartacea* Franchet, Bull. Mus. Hist. Nat. (Paris) 1: 64. 1895.

革叶报春 ge ye bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole narrowly winged, ca. as long as to shorter than leaf blade; leaf blade ovate to broadly elliptic or suborbicular, 2.5–5 × 2–4.5 cm, glabrescent, firm papery or subleathery, abaxially glaucous, base rounded to cordate, margin subentire to obscurely crenulate, apex rounded, initially puberulous along veins. Scapes 5–14 cm, ± puberulent on upper part; umbels 1, 2–6-flowered; bracts lanceolate to narrowly oblong, 4–7 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, puberulent. Calyx narrowly campanulate, 5–8 mm, puberulent, parted to middle; lobes oblong, apex rounded to obtuse. Corolla rose-lilac or rose-purple; tube 9–10 mm, puberulent inside; limb 1–1.5 mm wide; lobes broadly obovate, emarginate; lobules entire. Pin flowers: stamens at middle of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 3 mm. Capsule included in calyx, disintegrated at maturity. Fl. Apr–May.

* Margins of mixed forests; ca. 1800 m. N Yunnan (Daguan Xian, Yanjin Xian).

68. *Primula lacerata* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 14: 45. 1923.

遂瓣脆朔报春 sui ban cui shuo bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole 1–2 × as long as leaf blade, puberulent; leaf blade ovate-rounded to suborbicular, 2–6 × 2–5 cm, firm papery, glabrous, abaxially glaucous, base shallowly cordate, margin obscurely crenulate, apex rounded to obtuse. Scapes 8–18 cm, puberulent; umbels 1, 3–7-flowered; bracts lanceolate, 3–7 mm, axils with small petiolate leaves at fruiting. Flowers heterostylous. Pedicel 0.5–1.5 cm, elongated to 3 cm in fruit, fulvous pubescent. Calyx campanulate to tubular-campanulate, 6–7 mm, puberulent, parted to ± middle, 5-veined; lobes ovate, apex acute to obtuse. Corolla lavender-blue to bright pink; tube 1.1–1.3 cm, pilose inside; limb 1.5–2.5 cm wide; lobes obovate, apex 2-cleft; lobules lacerate. Pin flowers: stamens at middle of corolla tube; style exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 7 mm. Capsule included in calyx, disintegrated at maturity. Fl. Apr.

Rocky mountain slopes, mixed forests; ca. 2500 m. E Xizang [NW Myanmar].

69. *Primula veitchiana* Petitmengin, Monde Pl. 9: 14. 1907.

川西遂瓣报春 chuan xi sui ban bao chun

Primula pirolifolia H. L. 関 eill_.

Herbs perennial, efarinose. Leaves in a rosette; petiole 2–4 × as long as leaf blade, copiously minutely glandular when young; leaf blade suborbicular to depressed orbicular, rarely broadly elliptic, 1.5–3(–5) cm wide, subleathery when dry, abaxially grayish green, glabrous, adaxially dark green, base rounded to shallowly cordate, margin remotely dentate to crenate. Scapes 6–15 cm, elongated to 20 cm in fruit, sparsely glandular; umbels 1, 2–6-flowered; bracts lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 1–2.5 cm, short-stalked glandular. Calyx campanulate to tubular campanulate, 4–6 mm, sparsely short-stalked glandular, parted to middle; lobes ovate to ovate-oblong, glandular ciliate, apex obtuse to rounded. Corolla rose-purple; tube 7–10(–12) mm, sparsely puberulent inside; limb 1.5–2.5 cm wide; lobes obovate, 2-lobulate, margin denticulate to lacerate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule included in calyx, disintegrated at maturity. Fl. Apr.

* Rocks in forests; 1600–2600 m. W Sichuan, E Yunnan.

70. *Primula comata* H. R. Fletcher, J. Linn. Soc., Bot. 52: 338. 1942.

镇康报春 zhen kang bao chun

Herbs perennial, fulvous, pilose, lacking basal bud scales at anthesis. Leaves spatulate to obovate-oblong, 3–5 × 1–1.5 (–2) cm, base attenuate to a petiole, less than 5 mm, margin irregularly dentate, apex obtuse; petiole of inner leaves slightly longer than leaf blade; leaf blade sometimes elliptic, base broadly cuneate to subrounded. Scapes 2–3 cm; umbels 1, 3–12-flowered; bracts ovate-lanceolate, ca. 8 mm. Flowers heterostylous. Pedicel 1–1.5 cm. Calyx campanulate, 7–8 mm, parted to middle; lobes ovate, apex acute. Corolla blue to deep violet; tube 9–10 mm, pilose inside; limb 1.5–2 cm wide; lobes obovate, margin entire. Pin flowers: stamens ca. 4 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule disintegrated at maturity. Fl. Mar.

* Rocks in forests; 2800–3200 m. W Yunnan (Zhenkang Xian).

71. *Primula taliensis* Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 220. 1908.

大理报春 da li bao chun

Herbs perennial, farinose or efarinose. Leaves variable, 2–10 × 1–4 cm, enlarged to 20 cm at fruiting; outer leaves spatulate to obovate-spatulate, base tapered broadly winged petiole, short appressed pubescent, margin crenate to dentate, apex rounded; petiole of inner leaves 1–2 × as long as leaf blade; leaf blade ovate-rounded to reniform, 1.5–4 cm wide, base short cuneate to rounded or cordate, margin deeply

dentate to dentate-lobulate. Scapes 1–6 cm, ca. as long as to longer than leaf rosette at fruiting, copiously pilose; umbels 1, 2- to many flowered; bracts lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 1–3 cm, pilose. Calyx campanulate, 5–9 mm, pilose, parted to 1/3; lobes ovate to broadly lanceolate, margin occasionally denticulate, apex subacuminate to acute. Corolla white or purplish rose to purple-blue; tube 0.9–1.1 cm, sparingly pubescent outside, glabrous inside; limb 1.5–2 cm wide; lobes broadly obovate, 3-toothed. Pin flowers: stamens 3–4 mm above base of corolla tube; style nearly as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, included in calyx, disintegrated at maturity.

Grassy slopes, open forests, *Tsuga* forests; 2200–3300 m. W Yunnan [N Myanmar].

- 1a. Plants completely efarinose 71a. var. *taliensis*
1b. Plants yellow farinose on outer leaves and calyx 71b. var. *procera*

71a. *Primula taliensis* var. *taliensis*

大理报春(原变种) da li bao chun (yuan bian zhong)

Primula euosma Craib var. *puralba* W. W. Smith; *P. praticola* Craib.

Plants efarinose. Fl. Feb–Apr, fr. May–Jun.

Grassy slopes, open forests; 2200–3300 m. W Yunnan [N Myanmar].

71b. *Primula taliensis* var. *procera* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 291. 1990.

金粉大理报春 jin fen da li bao chun

Abaxial surface of outer leaves and calyx golden yellow farinose. Fl. Apr.

* *Tsuga* forests; ca. 3300 m. W Yunnan (Bijiang Xian).

72. *Primula gracilipes* Craib, Notes Roy. Bot. Gard. Edinburgh 6: 252. 1917.

纤柄脆朔报春 xian bing cui shuo bao chun

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole very short or nearly obsolete in outer leaves, ca. as long as to longer than leaf blade in inner leaves; leaf blade elliptic to obovate-elliptic or oblong-spatulate, 3–7 × 1–3.5 cm, sparsely minutely glandular, abaxially occasionally cream-colored farinose, base cuneate to subrounded, margin erose-denticulate, apex rounded. Scapes not developed; inflorescences arising from leaf rosette, many flowered. Flowers heterostylous. Pedicel 1–6 cm, glandular. Calyx campanulate to tubular campanulate, 5–9 mm, cream-yellow farinose or glandular, parted to middle; lobes oblong to ovate-oblong, apex acuminate to subobtuse. Corolla pink-purple; limb 1.5–3 cm wide; lobes broadly obovate, usually 3-toothed. Pin flowers: corolla tube ca. 1.1 cm; stamens ca. 5 mm above tube base; style ca. as long as to slightly longer than tube. Thrum flowers: corolla tube 1.2–1.3 cm; stamens toward tube apex; style slightly longer than calyx. Capsule subglobose, shorter than calyx, disintegrated at maturity. Fl. May–Jun. *2n* = 22, 36.

Forests; 3500–4000 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

It is extremely difficult to distinguish *Primula gracilipes* from the earlier published *P. petiolaris* Wallich, which was described from Nepal. It remains to be determined whether they are conspecific or not.

73. *Primula cunninghamii* King ex Craib, Notes Roy. Bot. Gard. Edinburgh 6: 250. 1917.

小脆朔报春 xiao cui shuo bao chun

Herbs perennial, without basal bud scales at anthesis. Leaves numerous, 1.5–11 × 1–4 cm; petiole obsolete to sometimes nearly as long as leaf blade in outer leaves; leaf blade oblong-spatulate to oblong-obovate, copiously sprinkled with whitish farina, abaxially minutely glandular, base attenuate, margin erose-denticulate, apex rounded. Scapes not developed; inflorescences arising from leaf rosette, many flowered. Flowers heterostylous. Pedicel 3–10 mm. Calyx tubular-campanulate, 4–6 mm, glandular, parted to middle or below; lobes ovate to lanceolate, ciliolate, apex acute to subacuminate. Corolla purplish pink, puberulent; tube 8–10 mm; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 1 mm above base of corolla tube; style 4–6 mm. Thrum flowers: stamens near middle of corolla tube; style 1–1.5 mm. Capsule unknown.

Rock crevices, *Rhododendron* thickets; 3300–4300 m. S Xizang [Sikkim].

74. *Primula hoffmanniana* W. W. Smith, Acta Horti Gothob. 2: 110. 1926.

川北脆朔报春 chuan bei cui shuo bao chun

Primula petiolaris Wallich var. *setschwianica* Pax & K. Hoffmann.

Herbs perennial. Basal bud scales absent or inconspicuous at anthesis. Leaves 2–4.5 × 1–1.5 cm; petiole ca. as long as leaf blade to very short, narrowly winged; leaf blade elliptic to narrowly obovate, submembranous when dry, short-stalked glandular, base attenuate, margin erose-denticulate, apex rounded or obtuse. Scapes obsolete; umbels 1; bracts linear-lanceolate, 5–10 mm. Flowers heterostylous. Pedicel 1–6(–12) cm, densely short-stalked glandular. Calyx tubular, 7–10 mm, sparsely minutely glandular, parted to 2/3; lobes lanceolate, apex often recurved, acuminate-subulate. Corolla pale rose, annulate; tube 1.2–1.4 cm; limb 1.5–2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens ca. 4 mm above base of corolla tube; style slightly exerted. Capsule disintegrated at maturity. Fl. May.

* Woodland margins, bamboo forests; 3000–3200 m. W Sichuan (Wenchuan Xian).

75. *Primula scapigera* (J. D. Hooker) Craib, Notes Roy. Bot. Gard. Edinburgh 6: 254. 1917.

葶花脆朔报春 ting hua cui shuo bao chun

Primula petiolaris Wallich var. *scapigera* J. D. Hooker, Fl. Brit. India 3: 494. 1882.

Herbs perennial, without basal bud scales at anthesis. Leaves dimorphic; outer leaves oblong-spatulate, tapered to base, 3–6 × 1–2.5 cm; petiole of inner leaves narrowly winged, usually 2–3 × as long as leaf blade; leaf blade oblong to broadly ovate, 2–7 × 1–6 cm, abaxially ± minutely glandular along veins, adaxially subglabrous, base truncate to shallowly cordate, margin irregularly coarse dentate, apex subrounded. Scapes ca. 4 cm at anthesis, to ca. as long as leaves in fruit; umbels 1, 2- to many flowered; bracts linear-lanceolate, 5–10 mm. Flowers heterostylous. Pedicel 1.5–4 cm. Calyx broadly campanulate, 8–10 mm, sparsely glandular, parted to middle; lobes ovate-triangular, apex acuminate-subulate. Corolla pink; tube ca. 1.4 cm; limb 2.5–3 cm wide; lobes broadly obovate, apex dentate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, shorter than calyx, disintegrated at maturity. Fl. May. $2n = 22$.

Tsuga and *Abies* forests; 2900–3700 m. S Xizang [Bhutan, Nepal, Sikkim].

76. *Primula bracteosa* Craib, Notes Roy. Bot. Gard. Edinburgh 6: 250. 1917.

叶苞脆朔报春 *ye bao cui shuo bao chun*

Primula boothii Craib.

Herbs perennial, without basal bud scales at anthesis. Leaves dimorphic; outer leaves spatulate to obovate-spatulate, 2–6 cm, base tapered into a short-winged petiole, apex rounded. Petiole of inner leaves 3–6 cm; leaf blade ovate to oblong-ovate, 3–6 × 2–5 cm, sparsely farinose, base truncate to cordate, margin irregularly dentate, apex rounded. Scapes 0.5–2 cm, elongated to 25 cm in fruit, farinose toward apex; umbels 1, few or many flowered; bracts linear-lanceolate, 3–10 mm, glandular ciliate, occasionally axils of bracts with stalked leaves, 0.6–2.5 cm wide. Flowers heterostylous. Pedicel 1.5–4.5 cm, ± farinose. Calyx campanulate, 7–10 mm, farinose, parted to middle; lobes ovate to ovate-oblong, apex acuminate. Corolla pinkish lilac; tube 1.2–1.3 cm, glandular pubescent; limb 2.5–3 cm wide; lobes broadly obovate, apex dentate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens on upper 1/3 of corolla tube; style 7–10 mm. Capsule disintegrated at maturity. Fl. Mar–Apr.

Rock crevices of ravines; 2300–2700 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

77. *Primula prevernalis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 291. 1990.

云龙报春 *yun long bao chun*

Herbs perennial, without basal bud scales at anthesis. Leaves numerous, sessile, obovate-elliptic to oblong-spatulate, 3–7 × 2–3 cm, tapered to base, glabrous, minutely glandular, margin irregularly hydatode-denticulate, apex rounded. Scapes less than 5 mm; umbels 1, 10–20-flowered; bracts linear to lanceolate, 4–6 mm, yellow farinose. Flowers heterostylous. Pedicel 0.5–1.5 cm, copiously bright yellow

farinose. Calyx campanulate, 7–8 mm, minutely glandular and yellow farinose, parted to 2/3; lobes ovate to ovate-lanceolate, glandular ciliate, apex subacuminate. Corolla purple; tube 1.2–1.3 cm, puberulent around mouth; limb 1.5–2.5 cm wide; lobes broadly obovate, apex 2-cleft; lobules irregularly denticulate. Thrum flowers: stamens ca. 8 mm above base of corolla tube; style ca. 2 mm. Capsule disintegrated at maturity. Fl. Feb.

* Mixed forests; ca. 2800 m. SW Yunnan (Yunlong Xian).

78. *Primula moupinensis* Franchet, Bull. Soc. Bot. France 33: 67. 1886.

宝兴报春 *bao xing bao chun*

Herbs perennial. Basal bud scales inconspicuous at anthesis. Leaves 4–10 × 1–3 cm at anthesis, to 6–17 × 4–7.5 cm at fruiting; petiole to 1/2 of blade; leaf blade at anthesis oblong-obovate to obovate, base tapered into a short-winged petiole, margin irregularly sharp dentate, apex rounded; leaf blade at fruiting obovate-elliptic to oblong and dentate-lobulate. Scapes ca. as long as petiole at anthesis, elongating to 29 cm in fruit; umbels 1, (2–)4- to many flowered; bracts triangular to ovate-triangular, 3–6(–8) mm. Flowers heterostylous. Pedicel 1.5–2.5 cm, elongated to 3 cm in fruit, glandular or sparsely farinose. Calyx campanulate, 6–7 mm, glandular or pale yellow farinose, parted to middle; lobes ovate to triangular, apex acute to obtuse. Corolla bluish purple; tube 1.1–1.3 cm; limb 1.5–2.5 cm wide; lobes broadly obovate, deeply emarginate; lobules entire. Pin flowers: stamens near middle of corolla tube; style slightly exerted. Thrum flowers: stamens at upper 1/3 of corolla tube; style 5–6 mm. Capsule subglobose, 4–5 mm in diam., included in calyx, disintegrated at maturity.

* Shaded wet areas in ravines and forests, streamsides; 2000–3400 m. Sichuan.

- 1a. All leaf bases attenuate 78a. subsp. *moupinensis*
1b. At least some leaf bases rounded to cordate 78b. subsp. *barkamensis*

78a. *Primula moupinensis* subsp. *moupinensis*

宝兴报春(原亚种) *bao xing bao chun* (*yuan ya zhong*)

Petiole of inner leaves inconspicuous to 1/2 as long as leaf blade, leaf blade obovate to obovate-elliptic, base attenuate. Corolla 1.5–2 cm in diam. Fl. Apr, fr. May.

* Shaded wet areas in ravines and forests; 2000–3000 m. W Sichuan.

78b. *Primula moupinensis* subsp. *barkamensis* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 291. 1990.

马尔康报春 *ma er kang bao chun*

Petiole of inner leaves usually ca. as long as leaf blade; leaf blade oblong, base rounded to shallowly cordate. Corolla to 2.5 cm in diam. Fl. Apr, fr. May–Jun.

* Streamsides, wet areas in forests; 2600–3400 m. NW Sichuan (Barkam Xian).

79. *Primula odontocalyx* (Franchet) Pax in Engler, Pflanzenn. IV. 237(Heft 22): 41. 1905.

齿萼报春 *chi e bao chun*

Primula petiolaris Wallich var. *odontocalyx* Franchet, J. Bot. (Morot) 9: 449. 1895; *P. hupehensis* Craib; *P. hylophila* I. B. Balfour & Farrer.

Herbs perennial, usually without basal bud scales at anthesis. Leaves subsessile to short petiolate, distinctly petiolate at fruiting; leaf blade oblong to ovate-spatulate, 2–5 × 0.8–1.6 cm, to 8 × 4 cm, tapered to base, sparsely minutely glandular, margin irregularly sharp denticulate, apex rounded. Scapes 0.5–4 cm at anthesis, elongated to 8 cm in fruit; umbels 1, (1–)3–8-flowered; bracts linear-lanceolate, 3–8 mm. Flowers heterostylous. Pedicel 0.5–2 cm, sparsely glandular. Calyx campanulate, 7–8 mm, glandular puberulent, parted to middle or slightly below, 5-veined; lobes ovate to ovate-triangular, occasionally with 1 or 2 teeth, apex acute to acuminate. Corolla pink or lilac-rose; tube 8–11 mm; limb 1.5–2(–2.5) cm wide; lobes obovate to oblong-obovate, emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style 7–8 mm. Capsule depressed globose, ca. 4 mm in diam., disintegrated at maturity. Fl. Mar–May, fr. Jun–Jul.

* Thickets, forest margins; 900–3400 m. S Gansu, W Henan, W Hubei, S Shaanxi, Sichuan.

80. *Primula euosma* Craib, Notes Roy. Bot. Gard. Edinburgh 11: 172. 1919.

绿眼报春 *lu yan bao chun*

Herbs perennial, without basal bud scales at anthesis. Leaves 2–8 × 1–3 cm; petiole nearly obsolete to occasionally ca. as long as leaf blade in inner leaves; leaf blade elliptic to obovate, glabrous, ± glandular, base attenuate, margin denticulate, apex rounded. Scapes 1–8 cm, elongated to 15 cm in fruit, sparsely minutely glandular toward apex; umbels 1, 2–10-flowered; bracts narrowly lanceolate, 5–8 mm. Flowers heterostylous. Pedicel 0.5–2 cm, sparsely glandular. Calyx broadly campanulate, 7–8 mm, sparsely glandular, parted slightly below middle; lobes spreading, ovate to oblong-ovate, glandular ciliate, apex acute. Corolla purplish rose to deep blue-purple, exannulate, puberulent outside; limb 2–2.5 cm wide; lobes broadly obovate, emarginate; lobules entire to crenulate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, included in calyx, disintegrated at maturity. Fl. Apr–Jul.

Wet meadows, shaded moist areas near streams; 3000–4700 m. W Yunnan [N Myanmar].

81. *Primula sinuata* Franchet, Bull. Mus. Hist. Nat. (Paris) 1: 65. 1895.

波缘报春 *bo yuan bao chun*

Primula candidissima W.W. Smith & Forrest; *P. nemoralis* I. B. Balfour; *P. plebeia* I. B. Balfour; *P. ragotiana* H. L. Knecht.

Herbs perennial, without basal bud scales at anthesis. Petiole indistinct to slightly longer than leaf blade, narrowly winged; leaf blade ovate-oblong to oblanceolate, 3–12 × 1–4 cm, sparsely minutely glandular, base attenuate to broadly cuneate, margin irregularly sinuate-dentate to lobulate, apex rounded. Scapes 2–10(–14) cm, puberulent, glabrescent; umbels 1, 3–9-flowered; bracts lanceolate to oblong-lanceolate, 4–7 mm, enlarged to 1.1 cm in fruit. Flowers heterostylous. Pedicel 0.5–1.5 cm, short-stalked glandular. Calyx campanulate, 5–8 mm, parted 1/3–1/2, 5-veined; lobes ovate to triangular, apex obtuse. Corolla white, rose, or violet; tube ca. 9.5 mm; limb 1–2 cm wide; lobes obovate, apex 2-cleft; lobules entire to obscurely dentate. Pin flowers: stamens at middle of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule disintegrated at maturity. Fl. Mar–Apr.

* Broad-leaved evergreen forests; ca. 1700 m. SW Sichuan, NE to CW Yunnan.

82. *Primula wenshanensis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 291. 1990.

滇南脆朔报春 *dian nan cui shuo bao chun*

Herbs perennial, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole narrowly winged, 1.5–3.5 cm; leaf blade elliptic to obovate-elliptic or suborbicular, 2–7.8 × 1.5–3.5 mm, papery when dry, glabrous, base obtuse to subrounded, margin dentate, apex rounded; lateral veins 6–9 pairs, nearly at 90° angles to midvein. Scapes 5–9 cm, glandular; umbels 1, 2–7-flowered; bracts lanceolate, 4–6 mm, apex acute. Flowers heterostylous. Pedicel 3–5 mm, elongated to 1–1.5 cm in fruit, minutely brownish glandular. Calyx narrowly campanulate, 5–7 mm, parted to 1/3, 5-veined; lobes triangular, apex acute. Corolla deep violet; limb ca. 1.5 cm wide; lobes triangular, apex acute; 2-lobed; lobules dentate. Pin flowers: tube 5.5–7 mm; style slightly exerted; stamens at middle of tube. Thrum flowers: tube ca. 9 mm; stamens near tube apex; style reaching middle of tube. Capsule globose, ca. 4 mm in diam., disintegrated at maturity. Fl. Feb.

* Mixed forests; ca. 2000 m. SE Yunnan (Wenshan Xian).

83. *Primula jucunda* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 209. 1937.

陕南脆朔报春 *shaan nan cui shuo bao chun*

Primula jucunda var. *ponticula* W.W. Smith.

Herbs perennial. Basal bud scales broadly ovate, 3–4 cm, densely white farinose. Leaves in a rosette; petiole ca. as long as leaf blade, narrowly winged, vaginate at base; leaf blade broadly elliptic, 3–5 × 2–3 cm, abaxially densely white or cream-yellow farinose, base rounded to subcordate, occasionally slightly decurrent, margin crenate, apex rounded. Scapes 8–15 cm, farinose toward apex; umbels 5–7-flowered;

bracts linear to linear-lanceolate, 7–10 mm, farinose. Flowers heterostylous. Pedicel ca. 5 mm, densely farinose. Calyx tubular, 9–10 mm, farinose, parted to 2/3; lobes linear-lanceolate, with prominent midvein. Corolla golden yellow; tube 1.4–1.5 cm; limb 1.5–2 cm wide; lobes elliptic to narrowly obovate, slightly emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens in upper 1/3 of corolla tube; style ca. 5 mm. Capsule disintegrated at maturity. Fl. Jul.

* Alpine meadows; ca. 3700 m. SE Xizang.

84. *Primula hilaris* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 209. 1937.

大花脆朔报春 da hua cui shuo bao chun

Herbs perennial. Basal bud scales narrowly oblong, 3–7 cm, purplish red, farinose. Leaves in a rosette; petiole slightly longer to 2 × as long as leaf blade, broadly winged; leaf blade elliptic to sometimes suborbicular, 2–8 × 1.5–4 cm, abaxially densely cream-yellow farinose, base rounded, subcordate to short attenuate, margin crenate, apex rounded. Scapes 3–10 cm, usually shorter than leaves, farinose toward apex; umbels 3–6-flowered; bracts linear-lanceolate, 0.7–1.5 cm. Flowers heterostylous. Pedicel 1.5–2.5 cm, farinose. Calyx campanulate, 6.5–7 mm, farinose, parted to middle, 5-ribbed; lobes ovate, apex acute. Corolla pale yellow; tube ca. 1.6 cm; limb 3–4 cm wide; lobes broadly obovate to suborbicular, apex emarginate to fimbriate. Pin flowers: stamens near middle of corolla tube; style ca. 2/3 as long as tube. Thrum flowers with positions reciprocal. Capsule disintegrated at maturity. Fl. Jul.

* Rocks, cliffs, steep open hillsides; 4000–5000 m. SE Xizang.

85. *Primula calthifolia* W.W. Smith in W.W. Smith & Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 300. 1927.

驴蹄草叶报春 lu ti cao ye bao chun

Herbs perennial, efarinose. Basal bud scales reddish brown, oblong, 2–7 cm. Leaves not well developed at anthesis, enlarged to 10–20 cm; petiole narrowly winged, 1.5–2 × as long as leaf blade; leaf blade suborbicular to broadly ovate, 4–8 × 3–7 cm, abaxially minutely reddish brown or blackish glandular, base rounded to subcordate, margin irregularly coarse dentate, apex rounded. Scapes 5–12 cm, elongated to 20 cm; umbels 3–7-flowered; bracts linear-lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 1–3 cm, glandular. Calyx reddish, campanulate, 6.5–7.5 mm, parted to middle; lobes broadly ovate, glandular ciliate, margin entire to obscurely dentate, apex obtuse to acute. Corolla bright yellow; limb 1.5–2 cm wide; lobes oblong to obovate, emarginate. Pin flowers: corolla tube ca. 1.2 cm; stamens ca. 5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube 1.4–1.5 cm; stamens toward apex of tube; style slightly shorter than calyx. Capsule disintegrated at maturity. Fl. Jun.

Marshes, bog margins; ca. 4000 m. SE Xizang [N Myanmar].

86. *Primula strumosa* I. B. Balfour & Cooper in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 201. 1916.

金黄脆朔报春 jin huang cui shuo bao chun

Herbs perennial. Basal bud scales ovate to ovate-oblong, to 5 cm, yellow farinose. Petiole broadly winged, concealed by basal bud scales at anthesis, becoming diffuse, ca. as long as leaf blade; leaf blade oblanceolate to obovate or oblong, 5–20 × 1–2.5 cm at anthesis, to 30 cm at fruiting, efarinose or yellow farinose abaxially, base attenuate to obtuse or shallowly cordate, margin crenate to denticulate, apex obtuse to acute. Scapes 7–18 cm at anthesis, elongated to 35 cm in fruit, yellow farinose distally, umbels 6- to many flowered; bracts lanceolate, 3–10 mm. Flowers heterostylous. Pedicel 1–2 cm, farinose. Calyx campanulate, 5–7.5 mm, densely yellow farinose, parted to middle; lobes ovate to ovate-oblong, margins overlapping, apex obtuse. Corolla yellow; tube 1.1–1.3 cm; limb 1.5–2.5 cm wide; lobes suborbicular, margin crenate to emarginate. Pin flowers: stamens at middle of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style slightly longer than calyx. Capsule disintegrated at maturity.

Alpine meadows, *Abies* and *Rhododendron* forests, margins of *Abies* forests; 3500–4300 m. S Xizang [Bhutan, Nepal].

Primula strumosa was treated by Richards (J. Scot. Rock Gard. Club 15: 211. 1977) as a subspecies of *P. calderiana* I. B. Balfour & Cooper because the plants hybridize freely in cultivation. However, both maintain their integrity in geographic isolation, and they are sufficiently distinct to justify their recognition at the species level.

- 1a. Leaf blade attenuate at base..... 86a. subsp. *strumosa*
1b. Leaf blade obtuse to cordate
at base 86b. subsp. *tenuipes*

86a. *Primula strumosa* subsp. *strumosa*

金黄脆朔报春(原亚种) jin huang cui shuo bao chun (yuan ya zhong)

Primula calderiana I. B. Balfour & Cooper subsp. *strumosa* (I. B. Balfour & Cooper) A. J. Richards.

Leaf blade oblanceolate to obovate, rarely elliptic, base attenuate. Fl. May–Jun, fr. Jul–Aug.

Alpine meadows, *Abies* and *Rhododendron* forests; 3600–4300 m. S Xizang [Bhutan, Nepal].

This is treated as *Primula calderiana* subsp. *strumosa* in the Flora of Bhutan.

86b. *Primula strumosa* subsp. *tenuipes* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 292. 1990.

矩圆金黄报春 ju yuan jin huang bao chun

Leaf blade oblong to ovate-oblong, base obtuse to shallowly cordate. Fl. May–Jun.

* Margins of *Abies* forests; 3500–4300 m. S Xizang (Dinggy_Xian, Gyirong Xian).

87. *Primula chionata* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 81. 1926.

裂叶脆朔报春 lie ye cui shuo bao chun

Herbs perennial, efarinose. Basal bud scales reddish, ovate to ovate-oblong, 1–1.5 cm. Petiole usually slightly shorter than leaf blade; leaf blade oblong to obovate-elliptic, 4–7 × 1.5–2 cm, glabrous, base attenuate, incised to pinnately lobed, apex rounded; lobules usually with 2 or 3 teeth. Scapes nearly obsolete; inflorescences arising from leaf rosette, 2–8-flowered; bracts linear, 5–10 mm. Flowers heterostylous. Pedicel 2–6 cm, sparsely glandular. Calyx campanulate to tubular campanulate, 7–10 mm, sparsely glandular, parted slightly below middle; lobes ovate to broadly lanceolate, margin entire to dentate. Corolla yellow or violet; tube 1.1–1.3 cm; limb 1.8–3 cm wide; lobes broadly obovate to suborbicular, emarginate. Pin flowers: stamens near middle of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule disintegrated at maturity.

* Grassy alpine slopes, wet meadows, near water; 3800–4400 m. S Xizang.

- 1a. Corolla yellow 87a. var. *chionata*
1b. Corolla violet 87b. var. *violacea*

87a. *Primula chionata* var. *chionata*

裂叶脆朔报春(原变种) lie ye cui shuo bao chun (yuan bian zhong)

Corolla yellow. Fl. Jul.

* Grassy alpine slopes; 3800–4400 m. S Xizang (Mainling Xian).

87b. *Primula chionata* var. *violacea* W.W. Smith, Trans. Roy. Soc. Edinburgh 61(2): 294. 1944.

蓝花裂叶报春 lan hua lie ye bao chun

Corolla violet. Fl. Jun.

* Wet meadows, near water; ca. 4200 m. S Xizang (Mainling Xian).

88. *Primula chionogenes* H. R. Fletcher, J. Linn. Soc., Bot. 52: 337. 1942.

粗齿脆朔报春 cu chi cui shuo bao chun

Herbs perennial, efarinose. Basal bud scales ovate-oblong, 1–3 cm, fleshy. Leaves in a rosette; petiole concealed by basal scales at anthesis, to 10 cm at fruiting; leaf blade ovate to broadly elliptic, 1.5–4 × 1–2.5 cm, glabrous, minutely glandular, base short attenuate to obtuse or subcordate, margin irregularly coarse dentate, apex rounded. Scapes obsolete or 5–7 mm, concealed in leaf rosette; umbels 2–6-flowered; bracts linear-lanceolate, 3–4 mm. Flowers heterostylous. Pedicel to 6–8 cm, sparsely glandular. Calyx campanulate, 8–10(–13) mm, sparsely glandular, parted slightly below middle; lobes ovate to ovate-lanceolate, margin hydathode-denticulate. Corolla yellow; limb 1.5–2.5(–3) cm wide, emarginate; lobules usually dentate. Pin flowers: corolla tube 1.1–1.3 cm; stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: corolla tube ca. 1.5 cm; stamens slightly above middle of corolla tube; style ca. 4 mm. Capsule disintegrated at maturity. Fl. May–Jun.

* Open hillsides, below cliffs; 3300–3700 m. SE Xizang.

89. *Primula griffithii* (Watt) Pax, Bot. Jahrb. Syst. 10: 213. 1888.

高葶脆朔报春 gao ting cui shuo bao chun

Primula obtusifolia Royle var. *griffithii* Watt, J. Linn. Soc., Bot. 20: 8. 1882.

Herbs perennial. Basal bud scales ovate, 2–5 cm, usually pale yellow farinose. Leaf blade 6–10 × 2–6 cm at anthesis, enlarged to 20–30 cm at fruiting; outer leaves oblong-ob lanceolate to elliptic, base attenuate; petiole of inner leaves broadly winged, ca. as long as leaf blade; leaf blade broadly ovate to deltoid, sparsely glandular or pale yellow farinose abaxially, base rounded to subrounded, margin sharply dentate to crenate, apex acute to subobtusely. Scapes 10–20 cm, elongated to 45 cm in fruit, farinose toward apex; umbels 5–12-flowered; bracts triangular to lanceolate, ca. 5 mm. Flowers heterostylous. Pedicel 1–2 cm, yellow farinose. Calyx campanulate, 4–5 mm, densely farinose, parted to 1/3; lobes triangular to subrectangular, apex acute to obtuse. Corolla deep purple; limb 2–2.5 cm wide; lobes obovate, glandular ciliate, emarginate. Pin flowers: corolla tube 1–1.1 cm; stamens ca. 4.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style slightly longer than calyx. Capsule disintegrated at maturity. Fl. May–Jun.

Woodland margins, meadows; 3100–4000 m. S Xizang (Yadong Xian) [Bhutan, NE India].

90. *Primula tanneri* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 55: 227. 1886.

心叶脆朔报春 xin ye cui shuo bao chun

Herbs perennial. Basal bud scales ovate to oblong, 2–5 cm, efarinose. Leaves in a rosette; petiole winged, 1–3 × as long as leaf blade; leaf blade ovate-deltoid, 2–10 × 2–7 cm, efarinose, sometimes puberulent abaxially, base cordate to subsagittate, margin irregularly coarse dentate, apex acute. Scapes 10–20 cm, elongated to 45 cm in fruit, scarcely farinose toward apex; umbels 2–12-flowered; bracts acuminate-subulate from broad base, 5–10 mm. Flowers heterostylous. Pedicel 1–3 cm, scarcely farinose. Calyx tubular-campanulate, 7–10 mm, scarcely farinose, parted slightly below middle to 2/3, 5-ribbed; lobes lanceolate, apex acute. Corolla light purple to deep purple, sometimes pale blue or white; tube 1–1.3 cm; limb 2–2.5 cm wide; lobes obovate-oblong, emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube or slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. as long as calyx. Capsule discoid, shorter than calyx, disintegrated at maturity. Fl. May.

Grassy slopes, woodlands; ca. 3600 m. S Xizang (Yadong Xian) [Bhutan, NE India, Nepal].

91. *Primula tsariensis* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 211. 1937.

察日脆朔报春 cha ri cui shuo bao chun

Herbs perennial. Basal bud scales ovate to oblong, 2–3 cm, reddish, efarinose. Petiole enveloped by basal scales, usually ca. as long as leaf blade, narrowly winged, vaginate at base; leaf blade elliptic to ovate-lanceolate, 3–8(–20) × 1.5–2(–8) cm, glabrous, base broadly cuneate, rounded to subcordate, margin regularly crenulate, apex obtuse. Scapes 2–33 cm, efarinose or scarcely farinose toward apex; umbels (1 or) 2–8(–15)-flowered; bracts often tinged with purple, linear, 0.6–1.5(–2) cm, with a wide base. Flowers heterostylous. Pedicel 0.5–2 cm, brownish short-stalked glandular. Calyx campanulate, 0.8–1.2 cm, minutely glandular, parted to middle; lobes ovate to ovate-lanceolate, ciliate, margin entire to dentate at apex, apex obtuse to acute. Corolla pink-purple to blue-purple, sometimes yellow, rarely white; tube ca. 1 cm; limb 1.5–3 cm wide; lobes broadly obovate to subrectangular, deeply emarginate. Pin flowers: stamens ca. 4 mm above corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 6.5 mm. Capsule discoid, shorter than calyx, disintegrated at maturity.

Wet meadows, streamsides, bogs in *Abies* forests; 3500–5000 m. SE Xizang [Bhutan].

- 1a. Calyx 7–10 mm; corolla lobes broadly obovate 91a. var. *tsariensis*
1b. Calyx 8.5–12 mm; corolla lobes subrectangular 91b. var. *porrecta*

91a. *Primula tsariensis* var. *tsariensis*

察日脆朔报春(原变种) cha ri cui shuo bao chun (yuan bian zhong)

Primula tanneri King subsp. *tsariensis* (W.W. Smith) A. J. Richards.

Leaf blade 4–8 cm. Scapes 2–12 cm. Calyx ca. 1 cm. Corolla lobes broadly obovate. Fl. Jun–Jul, fr. Jul–Aug.

Wet meadows, streamsides, bogs in *Abies* forests; 3500–5000 m. SE Xizang [Bhutan].

91b. *Primula tsariensis* var. *porrecta* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 213. 1937.

大察日报春 da cha ri bao chun

Leaf blade to 20 cm. Scapes to 33 cm, 10–15-flowered. Calyx 0.9–1.2 cm. Corolla lobes subrectangular. Fl. Jul–Aug.

* SE Xizang.

92. *Primula calderiana* I. B. Balfour & Cooper in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 7. 1915.

暗紫脆朔报春 an zi cui shuo bao chun

Primula calderiana f. *alba* (W.W. Smith) H. Hara; *P. calderiana* var. *alba* (W.W. Smith) W.W. Smith & H. R. Fletcher; *P. laeta* W.W. Smith; *P. roylei* I. B. Balfour & W.W. Smith; *P. roylei* subsp. *calderiana* (I. B. Balfour & Cooper) W.W. Smith & Forrest; *P. roylei* var. *alba* W.W. Smith.

Herbs perennial, strongly scented. Basal bud scales ovate to ovate-lanceolate, to 4 cm, yellow farinose. Petiole broadly

winged, nearly as long as leaf blade; leaf blade oblong to spatulate or oblanceolate, 5–20(–30) × 1–3.5(–6) cm, efarinose or sparsely pale yellow farinose abaxially, base attenuate, margin crenate, apex obtuse to rounded. Scapes 5–30 cm, farinose toward apex; umbels 4- to many flowered; bracts lanceolate, 5–10 mm, ± farinose. Flowers heterostylous. Pedicel 0.5–3.5 cm, sparsely cream-yellow farinose or glandular. Calyx often tinged with purple, campanulate, 5–8 mm, glandular, parted to middle; lobes ovate to ovate-oblong, margin farinose, apex obtuse to acute. Corolla dark purple to rich maroon, rarely white; tube 1–1.4 cm; limb 1.5–3.5 cm wide; lobes broadly obovate to suborbicular, slightly emarginate. Pin flowers: stamens near middle of corolla tube; style exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. as long as calyx. Capsule discoid, shorter than calyx, disintegrated at maturity. Fl. May–Jun. *2n* = 22.

Alpine meadows, streamsides; 3800–4700 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

93. *Primula chamaedoron* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 208. 1937.

大花脆朔报春 da hua cui shuo bao chun

Herbs perennial. Basal bud scales ovate to oblong, to 2.5 cm, reddish. Petiole broadly winged, nearly as long as leaf blade, mostly enveloped by basal scales; leaf blade elliptic to oblong, 2–4 cm × 5–10 mm, minutely glandular, base cuneate or subrounded, margin crenate-dentate, apex obtuse to rounded. Scapes nearly obsolete to 1.5 cm, sparsely glandular, 1-flowered; bracts usually 2 or 3, linear, 4–15 mm. Flower heterostylous. Pedicel 1–1.5 cm. Calyx slightly tinged with red, campanulate, 8–9 mm, glandular, parted to middle; lobes ovate to ovate-lanceolate, margin entire, apex rounded to obtuse. Corolla bluish purple, annulate; tube ca. 1.3 cm; limb 3–3.5 cm wide; lobes obovate to oblong-obovate, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers: stamens at middle of corolla tube; style ca. 4 mm. Capsule disintegrated at maturity. Fl. Jul.

* Wet meadows; 4700–5000 m. S Xizang.

94. *Primula chamaethauma* W.W. Smith in W.W. Smith & Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 300. 1927.

异葶脆朔报春 yi ting cui shuo bao chun

Primula chamaethauma var. *chiukiangensis* Chen.

Herbs perennial, base encircled by bud scales at anthesis. Petiole indistinct or occasionally nearly as long as leaf blade, broadly winged; leaf blade elliptic to oblong or obovate-spatulate, 2–10 × 1–3 cm, ± glandular, base attenuate, margin crenate to erose-dentate, apex rounded to obtuse. Scapes obsolete or occasionally to 6 cm and scarcely farinose toward apex; umbels 5–15-flowered; bracts linear-lanceolate, 7–10 mm. Flowers heterostylous or occasionally homostylous. Pedicel to 6 cm in ascopose plants, 1–2 cm in scapose plants. Ca-

lyx campanulate, 8–10 mm, minutely glandular, parted to middle; lobes ovate, apex obtuse to acute. Corolla wine red, annulate; tube 1.3–1.4 cm; limb 2–3 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style slightly shorter than tube. Thrum flowers: stamens in upper 2/3 of corolla tube; style 6–7 mm. Homostylous flowers with stamens and style ca. as long as calyx. Capsule disintegrated at maturity. Fl. Jul–Aug.

Stony mountain slopes, open banks; 4000–5000 m. SE Xizang, NW Yunnan [N Myanmar].

95. *Primula tongolensis* Franchet, J. Bot. (Morot) 9: 453. 1895.

东俄洛报春 *dong e luo bao chun*

Primula dielsii Petitmengin; *P. gentianoides* W.W. Smith & Kingdon-Ward.

Herbs perennial. Basal bud scales oblong to lanceolate, 1–1.5 cm. Petiole nearly as long as leaf blade, narrowly winged; leaf blade broadly spatulate, 1–4 cm × 5–10 mm, tapered to base, fleshy but thin and translucent when dry, margin entire or nearly so, apex rounded. Scapes obsolete; inflorescences 1–4-flowered. Flowers heterostylous. Pedicel 3–4 cm. Calyx tubular-campanulate, 5–9 mm, parted nearly to middle; lobes ovate, apex rounded. Corolla bluish violet, exannulate; tube 1.2–1.3 cm, pilose inside; limb ca. 2 cm wide; lobes suberect, oblong-obovate to oblanceolate, 1.6–1.7 cm, margin entire or slightly emarginate at apex. Pin flowers: stamens ca. 3.5 mm above base of corolla tube; style ca. as long as calyx. Capsule disintegrated at maturity. Fl. Jun.

* Alpine meadows; 4000–4500 m. W Sichuan, NW Yunnan.

96. *Primula sonchifolia* Franchet, Bull. Soc. Bot. France 32: 266. 1885.

苜叶报春 *ju ye bao chun*

Herbs perennial, base with overlapping farinose bud scales appearing bulblike. Petiole initially indistinct, to 1/2 as long as leaf blade at fruiting; leaf blade oblong to obovate-oblong, tapered to base, irregularly lobulate to pinnatifid, not well developed at anthesis, 3–10(–15) cm, enlarged to 35 × 12 cm; apex rounded to subacute; lobules irregularly denticulate, usually efarinose. Scapes usually ca. as long as leaves at anthesis, elongated to 30 cm in fruit; umbels 3- to many flowered; bracts ovate-triangular to ovate-lanceolate, 2.5–6 mm. Flowers heterostylous. Pedicel 0.6–2.5 cm. Calyx campanulate, 4–6 mm, slightly enlarged, poculiform in fruit, parted to 1/3; lobes ovate to subrectangular, margin entire to dentate, apex obtuse. Corolla lavender-blue to purplish blue, rarely white; limb 1.5–2.5 cm wide. Pin flowers: corolla tube 9–10 mm; stamens at middle of corolla tube; style ca. as long as tube or slightly exerted. Thrum flowers: corolla tube 1.1–1.3 cm; stamens toward apex of corolla tube; style slightly longer than calyx. Capsule globose, ca. 4.5 mm in diam., disintegrated at maturity.

Meadows, forest margins; 2300–4600 m. Sichuan, NW Yunnan [N Myanmar].

- 1a. Leaf blade divided to 1/3 from margin 96a. subsp. *sonchifolia*
1b. Leaf blade divided to 2/3 from margin 96b. subsp. *emeiensis*

96a. *Primula sonchifolia* subsp. *sonchifolia*

苜叶报春(原亚种) *ju ye bao chun* (*yuan ya zhong*)

Primula drymophila Craib; *P. gratissima* Forrest; *P. sonchifolia* var. *atrocoerulea* Forrest; *P. taraxacoides* I. B. Balfour.

Leaf blade dentate-lobulate, divided to 1/3 from margin. Scapes and inflorescences ± yellow farinose. Corolla lobes obovate to suborbicular, with few to many small teeth. Fl. Mar–May, fr. Jun–Jul.

Meadows, forest margins; 3000–4600 m. W Sichuan, NW Yunnan [N Myanmar].

96b. *Primula sonchifolia* subsp. *emeiensis* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 292. 1990.

峨眉苜叶报春 *e mei ju ye bao chun*

Leaf blade deeply pinnatifid, divided to 2/3 from margin. Scapes and inflorescences efarinose. Corolla lobes obovate-oblong to elliptic, margin entire. Fl. May.

* Margins of mixed forests and *Abies* forests; 2300–3000 m. Sichuan (Emei Shan).

97. *Primula whitei* W.W. Smith, Rec. Bot. Surv. India 4: 268. 1911.

鹃林脆朔报春 *juan lin cui shuo bao chun*

Primula bhutanica H. R. Fletcher.

Herbs perennial, base with many farinose overlapping bud scales. Petiole initially indistinct, nearly as long as leaf blade in fruit; leaf blade elliptic to oblong-elliptic or spatulate, tapered to base, 2–10 × 1–3 cm at anthesis, enlarged to 30 × 7 cm, scarcely glandular farinose, margin erose-denticulate, apex rounded to obtuse. Scapes 1–2 cm, elongated to 30 cm, farinose; umbels 3- to many flowered; bracts linear to linear-lanceolate, 0.8–1.5 cm. Flowers heterostylous. Pedicel 2–5 cm, farinose or glandular. Calyx campanulate, 7–10 mm, pale yellow farinose or minutely glandular, parted to middle; lobes ovate to ovate-oblong, margin dentate or occasionally entire. Corolla blue to pale bluish violet; limb 2.5–3.5 cm wide; lobes broadly obovate, apex 3-toothed to crenate. Pin flowers: corolla tube ca. 1.2 cm; stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube ca. 1.7 cm; stamens toward apex of corolla tube; style ca. 1/2 as long as tube. Capsule shorter than calyx, disintegrated at maturity. Fl. Mar.

Coniferous forests, *Rhododendron* thickets; 3000–4300 m. S Xizang [Bhutan, India].

98. *Primula hookeri* Watt, J. Linn. Soc., Bot. 20: 14. 1882.

春花脆朔报春 *chun hua cui shuo bao chun*

Herbs perennial, base with overlapping, reddish, ovate to oblong scales, 0.5–2 cm. Leaves sessile, 1.5–4 × 0.6–1.5 cm, slightly emergent from basal scales at anthesis, to 15 × 5 cm and distinctly petiolate at fruiting; leaf blade oblong-ovate to spatulate, tapered to base, apex rounded to obtuse. Scapes less than 3 mm, included in leaves, elongated to 30 cm in fruit, sparsely glandular; umbels (1–)3-flowered; bracts linear to subulate, 5–7 mm. Flowers homostylous. Pedicel 1–2 mm, glandular. Calyx broadly campanulate or poculiform, 5–8 mm, minutely glandular, parted nearly to middle; lobes suborbicular to rectangular, glandular ciliate, margin denticulate. Corolla white or blue-violet; tube 7–8 mm; limb 7–10 mm wide; lobes oblong, suberect, subtruncate or slightly emarginate at apex. Stamens inserted at middle of corolla tube. Style slightly longer than anthers. Capsule disintegrated at maturity.

Alpine meadows, rocky slopes, forests, gravelly avalanche deposits; 3900–5000 m. SE Xizang, NW Yunnan [Bhutan, NE India, Myanmar, Nepal, Sikkim].

- 1a. Corolla white 98a. var. *hookeri*
1b. Corolla bluish violet 98b. var. *violacea*

98a. *Primula hookeri* var. *hookeri*

春花脆朔报春(原变种) chun hua cui shuo bao chun (yuan bian zhong)

Primula vernicosa Kingdon-Ward.

Corolla white. Fl. Jun–Jul.

Alpine meadows, rocky slopes, forests; 4000–5000 m. SE Xizang, NW Yunnan [Bhutan, NE India, Myanmar, Nepal].

98b. *Primula hookeri* var. *violacea* (W.W. Smith) C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 97. 1990.

蓝春花报春 lan chun hua bao chun

Primula vernicosa Kingdon-Ward var. *violacea* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 214. 1937.

Corolla bluish violet. Fl. Jun–Jul.

* *Abies* forests, gravelly avalanche deposits; 3900–4100. SE Xizang.

99. *Primula bomiensis* Chen & C. M. Hu, Acta Phytotax. Sin. 18: 383. 1980.

波密脆朔报春 bo mi cui shuo bao chun

Herbs perennial, base with overlapping bud scales. Leaves 2–3.5 × ca. 1 cm, obscurely petiolate at anthesis, to 10 × 4.5 cm and with a petiole 1/3–1/2 as long as blade at fruiting; leaf blade oblong to obovate, tapered to base, margin irregularly hydathode-denticulate, apex subrounded. Flowering scapes 1.5–3 cm, densely glandular pubescent, elongated to 20 cm in fruit; umbels 2- or 3-flowered; bracts 2–4, linear-acuminate from wider base, 5–6 mm. Flowers heterostylous. Pedicel ca. 3 mm, elongated to 1.5 cm in fruit, densely glandular pubescent. Calyx tubular-campanulate, 8–9 mm, sparsely glandular, parted to middle; lobes ovate, ciliate, apex acute to subobtusate. Corolla pale rose-purple;

tube ca. as long as calyx; limb 8–10 mm wide; lobes obovate, slightly emarginate. Thrum flowers: stamens toward apex of corolla tube; style ca. 2 mm. Capsule subglobose, ca. 6 mm in diam., disintegrated at maturity. Fl. May, fr. Aug.

* *Abies* forests; ca. 3700 m. E Xizang (Bomi Xian).

100. *Primula exscapa* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 293. 1990.

无葶脆朔报春 wu ting cui shuo bao chun

Herbs perennial, efarinose, with small membranous basal bud scales at anthesis. Leaves in a rosette; petiole 2–4.5 cm, densely fulvous pilose; leaf blade elliptic to oblong or oblong-obovate, 2.5–7 × 1.5–3.5 cm, enlarged to 12 × 6.5 cm at fruiting, firm papery, abaxially with tawny multicellular hairs along midvein and lateral veins, otherwise glabrous, adaxially fulvous pilose along midvein, otherwise glabrous or sparsely pubescent, base obtuse to broadly cuneate, margin obscurely crenate, apex rounded. Scapes obsolete; inflorescences 1–4-flowered from leaf rosette. Flowers heterostylous. Pedicel 1.5–4 cm, elongated slightly in fruit, densely fulvous pilose. Calyx campanulate, 7–9 mm, sparsely pilose on proximal 1/2, parted to middle; lobes ovate-lanceolate to lanceolate, ciliate. Corolla purple; tube ca. 1.1 cm; limb 1.5–1.8 mm wide; lobes narrowly obovate, emarginate. Pin flowers: stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style 3–4 mm. Capsule disintegrated at maturity. Fl. Mar–Apr.

* Rocks near water; 2200–2400 m. C Yunnan (Jingdong Xian).

101. *Primula praeflorens* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 293. 1990.

早花脆朔报春 zao hua cui shuo bao chun

Herbs perennial, evergreen; resting buds with small membranous scales. Leaves usually numerous; petiole 0.5–2 cm, fulvous pilose; leaf blade elliptic to oblong, (1–)1.5–5.5 × 0.8–2.8 cm, ciliate, abaxially sparsely fulvous pilose along midvein and lateral veins, adaxially sparsely pubescent along midvein, base broadly cuneate to obtuse, margin obscurely dentate to crenate, apex rounded. Scapes obsolete; inflorescences 1–3-flowered from leaf rosette, without bracts. Flowers heterostylous. Pedicel 5–18 cm, sparsely pilose. Calyx tubular campanulate, 5–6.5 mm, sparsely glandular, parted nearly to middle; lobes ovate-triangular, ciliate, apex acuminate. Corolla rose; tube 8–9 mm; limb 1.2–1.8 cm wide; lobes obovate-oblong, emarginate. Pin flowers: stamens 2.5–3 mm above base of corolla tube; style ca. as long as tube. Capsule disintegrated at maturity. Fl. Dec.

* Rocks near woodland margins; ca. 2400 m. C Yunnan (Jingdong Xian).

102. *Primula coerulea* Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 221. 1908.

蓝花大叶报春 lan hua da ye bao chun

Herbs perennial, evergreen, with few small membranous basal bud scales. Leaves of current year not well developed at

anthesis; leaves of previous year firm papery; petiole 1–7 cm, with long dense multicellular hairs; leaf blade elliptic to oblong-oblancheolate, 3.5–10 × 2–4.5 cm, abaxially with multicellular hairs along veins, adaxially bullate, glabrous except for a few long hairs on midvein, base obtuse to rounded, margin sinuate-denticulate, apex rounded. Scapes 2–7 cm, with dense long multicellular hairs, 1(–3)-flowered; bracts usually 2, alternate or opposite, linear-lanceolate, 2–5 mm. Flowers heterostylous. Pedicel 2–10 mm, pilose. Calyx campanulate, 0.8–1.3 cm, ± pubescent, parted slightly below middle; lobes ovate to ovate-lanceolate, ciliolate, overlapping at base. Corolla purplish blue; limb 2.5–3.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: corolla tube 1.2–1.3 cm; stamens ca. 5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube 1.4–1.7 cm; stamens 1.2–1.3 cm above base of corolla tube; style ca. 6 mm. Capsule discoid, operculate, disintegrated at maturity. Fl. Mar–Apr.

* Rocks, woodlands; 2500–4000 m. Yunnan (Dali Xian, Yangbi Xian).

103. *Primula esquirolii* Petitmengin, Bull. Soc. Sci. Nancy, S開. 3, 8: 16. 1907.

贵州卵叶报春 *gui zhou luan ye bao chun*

Herbs perennial, with small membranous basal bud scales. Leaves in a rosette; petiole nearly obsolete, rarely to 1.5 cm; leaf blade elliptic-obovate to obovate-oblancheolate, 5–13 × 1.5–5 cm, subleathery, abaxially densely short glandular pubescent along veins, adaxially bullate, sparsely glandular, base attenuate, margin sinuate-dentate to denticulate, apex rounded; veins distinctly raised. Scapes less than 1 cm at anthesis, sparsely glandular; umbels 1, 4- to many flowered; bracts linear-lanceolate, 3–7 mm. Flowers homostylous. Pedicel 1–2 cm, glandular. Calyx campanulate, 5–7 mm, sparsely glandular, parted nearly to middle; lobes triangular-lanceolate. Corolla pale blue or rose; tube 1.5–1.6 cm; limb 1.5–2 cm wide; lobes obovate, emarginate. Stamens toward apex of corolla tube. Style 1.1–1.2 cm, reaching base of anthers. Capsule discoid, disintegrated at maturity. Fl. Mar.

* Limestone cliffs. W Guizhou (Pingba Xian).

104. *Primula tridentifera* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 292. 1990.

三齿叶报春 *san chi ye bao chun*

Herbs perennial, with overlapping small membranous basal bud scales. Petiole nearly obsolete; leaf blade obovate to obovate-oblong, 4.5–10 × 2.5–5.2 cm, tapered to base, subleathery, abaxially densely white farinose, adaxially bullate, white farinose or glandular, margin dentate-lobulate, apex rounded; veins distinctly raised and alveolate abaxially. Scapes 9–12 cm, ± glandular; umbels 1, 5–9-flowered; bracts lanceolate, 6–9 mm. Flowers heterostylous. Pedicel 1–1.5 cm, sparsely glandular. Calyx campanulate, 0.9–1.1 cm, sparsely glandular, parted to ca. 1/3; lobes ovate to ovate-oblong, margin 3-toothed at apex; veins 3, distinct. Corolla purple; tube ca. as long as calyx; limb ca. 2 cm wide; lobes obovate, apex 2-cleft. Pin flowers: stamens near middle of corolla tube;

style ca. as long as tube. Capsule discoid, disintegrated at maturity. Fl. May.

* Woodlands, cliffs exposed to running water; 2000–3000 m. W Sichuan (Ebian Xian), NE Yunnan (Daguan Xian).

105. *Primula chienii* Fang, Acta Univ. Szechuan. 1: 83. 1956.

青城报春 *qing cheng bao chun*

Herbs perennial, with few small membranous basal bud scales. Leaves in a rosette; petiole 1/4–1/2 as long as or occasionally nearly as long as leaf blade; leaf blade elliptic to obovate-oblong, (1.5–)3–9 × 1.5–4.8 cm, thin papery when dry, abaxially paler, glabrous, adaxially dark green, base subrounded to broadly cuneate, margin obscurely blunt dentate, apex rounded. Scapes (2–)3.5–12 cm, elongated to 16 cm in fruit, sparsely glandular; umbels 2–8-flowered; bracts lanceolate, 4–8 mm, ciliolate. Flowers heterostylous. Pedicel 1–1.5(–2) cm, sparsely glandular. Calyx campanulate, 8–10 mm, minutely glandular, parted to middle; lobes ovate-lanceolate to lanceolate, ciliolate. Corolla pale purple; limb ca. 2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: corolla tube 1.2–1.3 cm; stamens at middle of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube 1.6–1.7 cm; stamens toward apex of corolla tube; style slightly shorter than calyx. Capsule discoid, disintegrated at maturity. Fl. Mar.

* Shaded moist areas in mixed forests; 900–1000 m. Sichuan (Guanxian Xian).

106. *Primula breviscapa* Franchet, Bull. Mus. Hist Nat. (Paris) 1: 65. 1895.

短葶报春 *duan ting bao chun*

Herbs perennial, efarinose. Basal bud scales ovate to ovate-oblong, 8–20 cm, ciliolate, apex acute. Leaves in a rosette; petiole 2–8.5 cm, with multicellular hairs; leaf blade elliptic to oblong, (3–)6–16 × 2–6.5 cm, thin papery when dry, abaxially with multicellular hairs along midvein and lateral veins, adaxially glabrous, base obtuse to broadly cuneate, margin irregularly hydathode-dentate, apex rounded; lateral veins 10–13 pairs, raised abaxially; reticulate veins inconspicuous. Scapes arising from resting bud, 5–8 cm, elongated to 18 cm in fruit, with tawny multicellular hairs; umbels 2–8-flowered; bracts linear-lanceolate, 4–7 mm. Flowers heterostylous. Pedicel 6–8 mm, sparsely pilose. Calyx campanulate, ca. 9 mm, sparsely puberulent, parted nearly to middle; lobes ovate-lanceolate, apex acute. Corolla violet; limb 2–2.5 mm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube nearly as long as calyx; stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube ca. 3 mm longer than calyx; stamens toward apex of corolla tube; style 3–4 mm. Capsule discoid, disintegrated at maturity. Fl. May.

* Moist rocks. NE Yunnan (Daguan Xian).

Primula breviscapa is known only from Abb_ Delavay's type collection of 1894.

107. *Primula tardiflora* (C. M. Hu) C. M. Hu, Novon 4: 104. 1994.

晚花叶报春 wan hua ye bao chun

Primula ovalifolia Franchet subsp. *tardiflora* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 292. 1990.

Herbs perennial, not mealy. Rhizomes short, thick, with ovate to oblong-ovate scales 1–3 cm. Petiole as long as leaf blade or shorter, narrowly margined; leaf blade broadly ovate to broadly elliptic, (3–)5–9 × 2.5–6 cm, ± enlarged after anthesis, thin papery, abaxially pubescent along veins, glabrous elsewhere, adaxially glabrous, base attenuate to narrowly decurrent, margin hydathode-dentate, apex rounded; lateral veins 10–12 pairs. Scapes 5–12 cm, to 18 cm in fruit, sparsely brownish pubescent; umbels 1, 3–6-flowered; bracts linear-lanceolate, 3–5 mm. Flowers heterostylous. Pedicel 7–12 mm, to 2 cm in fruit, sparsely pubescent. Calyx campanulate, 9–10 mm, puberulent outside, parted to middle; lobes lanceolate, apex acute. Corolla pale purple, with a white eye; tube slightly longer than calyx; limb 2–2.5 cm in diam.; lobes oblong-ovate, emarginate. Pin flowers: stamens inserted at middle of corolla tube; style exerted. Thrum flowers: stamens inserted slightly below middle of corolla tube; style reaching middle of corolla tube. Ovary globose. Capsule unknown. Fl. Apr–May.

* Deciduous broad-leaved forests; 2000–2500 m. Sichuan (Emei Shan).

Primula tardiflora is apparently confined to a small area on Emei Shan. It superficially resembles *P. ovalifolia* Franchet, but can be distinguished by the attenuate base of the leaf blade and sparsely pubescent veins. Furthermore, *P. ovalifolia* occurs at low elevations on Emei Shan, reaching its upper altitudinal limit at 1700 m, while *P. tardiflora* grows at higher altitudes (2000–2500 m), and flowers from the end of April to May, about one month later than *P. ovalifolia*.

108. *Primula ovalifolia* Franchet, Bull. Soc. Bot. France 33: 67. 1886.

卵叶报春 luan ye bao chun

Primula aequipila Craib; *P. limprichtii* Pax; *P. macropoda* Craib; *P. polia* Craib.

Herbs perennial, evergreen, efarinose, encircled at base with reddish small membranous bud scales. Leaves in a rosette; petiole usually ca. 1/3 as long as leaf blade, densely pilose; leaf blade broadly elliptic to oblong-elliptic or broadly obovate, 3.5–11.5 × 2–10 cm, firm papery or subleathery, abaxially with multicellular hairs along midvein and lateral veins, otherwise pubescent, adaxially glabrous except sparsely pubescent on midvein, base rounded to broadly cuneate, rarely subcordate, margin obscurely crenate or hydathode-denticulate, apex rounded to obscurely emarginate; veins prominently raised and alveolate abaxially, impressed adaxially. Scapes 5–18 cm, pilose, elongated slightly and glabrescent in fruit; umbels 2–7(–9)-flowered; bracts lanceolate, 3–8 mm. Flowers heterostylous. Pedicel 0.5–2 cm, pilose. Calyx campanulate, 6–10 mm, puberulent, parted to middle or nearly so; lobes

ovate to ovate-lanceolate, ciliolate, margin entire to occasionally dentate, apex acute to obtuse. Corolla bluish purple or violet; limb 1.5–2.5 mm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube ca. as long as to slightly longer than calyx; stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube ca. 1.5 × as long as calyx; stamens toward apex of corolla tube; style 3.5–5 mm. Capsule globose, shorter than calyx. Fl. Mar–Apr, fr. May–Jun.

* Shaded areas in broad-leaved forests and ravines, 600–2500 m. Guizhou, Hubei, W Hunan, Sichuan, NE Yunnan.

109. *Primula crassa* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 61: 132. 1924.

毛卵叶报春 mao luan ye bao chun

Herbs perennial, efarinose, with small oblong membranous scales at base. Leaves in a rosette; petiole ca. 1/5 to nearly as long as leaf blade; leaf blade elliptic to obovate, 5–10 × 2–6.5 cm, abaxially with longer hairs along prominently raised midvein and lateral veins, adaxially pilose and ± bullate, base cuneate-attenuate to subrounded, margin obscurely undulate-crenate, apex rounded. Scapes ca. as long as to slightly longer than leaves, with multicellular hairs; umbels 2–7-flowered; bracts ovate-lanceolate, 4–9 mm. Pedicel 5–12 mm, pilose. Calyx urceolate-turbinate, 7–9 mm, sparsely pilose, parted to middle; lobes ovate to ovate-lanceolate, ciliolate. Corolla rosy violet; tube ca. as long as calyx; limb ca. 1.5 cm wide; lobes obcordate to obovate, deeply emarginate. Capsule globose, included in calyx tube. Fl. Mar.

* Woodlands, rocky slopes in forests; 2600–2800 m. SW Sichuan.

110. *Primula leptophylla* Craib, Notes Roy. Bot. Gard. Edinburgh 11: 174. 1919.

薄叶长柄报春 bao ye chang bing bao chun

Herbs perennial, efarinose, encircled at base with small membranous bud scales. Leaves in a rosette; petiole 2–5 cm, membranously winged, markedly pilose; leaf blade elliptic to oblong or oblong-obovate, 5–8 × 4–5 cm, membranous or subpapery when dry, abaxially densely minutely glandular, with white multicellular hairs along midvein and lateral veins, adaxially minutely glandular, base subcuneate, margin obscurely crenate to slightly repand, apex rounded. Scapes 9–14 cm, with short glandular hairs intermixed with few long ones; umbels 5–9-flowered; bracts ovate, 5–6 × 3–4 mm, ciliolate. Pedicel 1.5–2 cm, with few short glandular hairs intermixed with few long ones. Calyx campanulate, 8–10 mm, puberulent, parted to middle; lobes ovate, ciliate, apex acute. Corolla and capsules unknown. Fl. early spring.

* Grassy slopes bordering plateaus; ca. 2500 m. NE Yunnan.

111. *Primula epilosa* Craib, Notes Roy. Bot. Gard. Edinburgh 11: 171. 1919.

二郎山报春 er lang shan bao chun

Primula cheniana Fang.

Herbs perennial, evergreen, with small brown membranous basal bud scales. Leaves in a rosette; petiole 0.5–2.5 cm; leaf blade oblong-obovate to oblong-ob lanceolate, 5–10 × 2–4 cm, tapered to base, subleathery, abaxially scurfy glandular, adaxially glabrous, bullate, margin hydathode-dentate, apex rounded; veins distinctly raised abaxially. Scapes 3.5–14 cm, sparsely glandular; umbels 1, 2–5-flowered; bracts linear-lanceolate, 3–10 mm. Flowers heterostylous. Pedicel 0.4–2 cm, sparsely glandular. Calyx campanulate, (0.7–)0.9–1.1 cm, minutely glandular, parted to middle; lobes ovate to ovate-lanceolate, ciliolate, apex acute to short acuminate. Corolla rose-purple with a yellow eye; limb ca. 3 mm wide; lobes obovate, emarginate or 2-cleft at apex. Pin flowers: corolla tube ca. 1 cm; stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: corolla tube 1.4–1.7 cm; stamens toward apex of corolla tube; style 4–5.5 mm. Capsule shorter than calyx. Fl. Apr–May.

* Margins of mixed forests, moist rocks; 2000–2900 m. W Sichuan (Luding Xian, Tianquan Xian).

112. *Primula klaveriana* Forrest in W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 15: 252. 1927.

云南卵叶报春 yun nan luan ye bao chun

Herbs perennial, efarinose, with small oblong membranous basal bud scales. Petiole nearly obsolete to 1 cm; leaf blade elliptic-obovate to oblong-obovate, 4–14 × 3–8 cm, enlarged to 35 × 15 cm at fruiting, papery or firm papery, abaxially with dense short glandular hairs and multicellular hairs on midvein, adaxially minutely glandular, base obtuse to broadly cuneate, margin crenate, apex rounded to slightly retuse. Scapes 10–12 cm, elongated to 30 cm in fruit, ± pilose; umbels 2–10-flowered; bracts lanceolate, 6–12 mm, puberulent. Flowers homostylous. Pedicel ca. 1 cm, elongated to 2 cm in fruit. Calyx campanulate, 1.1–1.3 cm, pubescent, parted slightly below middle; lobes ovate-lanceolate, apex acute. Corolla blue to lavender-blue; tube ca. 1.8 cm; limb 2–2.5 cm wide; lobes obovate, margin entire. Stamens near apex of corolla tube. Style exerted ca. 4 mm above anthers. Capsule globose, shorter than calyx. Fl. Apr.

Thicket margins, streamsides; 2700–3700 m. W Yunnan [N Myanmar].

113. *Primula davidii* Franchet, Bull. Soc. Bot. France 33: 66. 1886.

大叶宝兴报春 da ye bao xing bao chun

Herbs perennial, efarinose, with small brown membranous basal bud scales. Petiole usually indistinct or nearly obsolete; leaf blade oblong to obovate-oblong, (5–)8–18 × 1.5–4 cm, tapered to base, subleathery when dry, abaxially fulvous hirsute along midvein, adaxially glabrous and bullate, margin sharply erose-dentate, apex rounded; veins prominent, subalveolate. Scapes 8–20 cm, rust-colored pilose; umbels 2–10-flowered; bracts lanceolate, 4–7 mm. Pedicel 1–1.5 cm, sparsely short hirtellous. Calyx campanulate, 9–10 mm, puberulent, parted nearly to middle, 5-veined; lobes ovate to ovate-triangular, apex acute. Corolla

pale rose-purple; tube ca. 1.2 cm; limb 2–3 cm wide; lobes broadly obovate, slightly emarginate. Pin flowers: stamens ca. 3.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers unknown. Capsule unknown. Fl. Apr.

* Cliffs exposed to running water; ca. 1000 m. W Sichuan (Lushan Xian).

114. *Primula fagosa* I. B. Balfour & Craib in Craib, Notes Roy. Bot. Gard. Edinburgh 11: 172. 1919.

城口报春 cheng kou bao chun

Herbs perennial, efarinose, with small oblong membranous basal bud scales. Petiole less than 1.5 cm; leaf blade obovate-oblong to obovate-ob lanceolate, 5–15 × 3–7 cm, firm papery when dry, abaxially hirtellous along midvein and lateral veins, adaxially glabrescent, strongly bullate, base cuneate-attenuate, margin remotely hydathode-denticulate, apex rounded; veins distinctly raised, alveolate abaxially. Scapes 6–15 cm, sparsely pilose; umbels 3–7-flowered; bracts linear, 4–7 mm. Flowers heterostylous. Pedicel ca. 1.5 cm, pubescent. Calyx campanulate, 8.5–10 mm, pubescent, parted to 1/3 or slightly below; lobes ovate, ciliolate, apex short acuminate. Corolla bluish purple; limb 2–3 cm wide; lobes broadly obovate, emarginate. Pin flowers: corolla tube ca. 1.2 cm; stamens ca. 5 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube ca. 1.5 cm; stamens toward apex of corolla tube; style ca. as long as calyx. Capsule shorter than calyx. Fl. May, fr. Jun.

* Mountain glades; ca. 1500 m. E Sichuan (Chengkou Xian).

115. *Primula hylobia* W.W. Smith in W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 15: 251. 1927.

亮叶报春 liang ye bao chun

Herbs perennial, efarinose, with overlapping small membranous basal bud scales. Petiole to 2 cm; leaf blade obovate to broadly ob lanceolate, 14–20 × 4–8 cm, tapered to base, papery when dry, abaxially densely minutely glandular hirsute, with multicellular hairs along midvein, adaxially minutely glandular hirsute, margin irregularly crenate to crenulate-lobulate, apex rounded. Scapes 18–24 cm, ± pubescent; umbels 6–11-flowered; bracts linear-lanceolate, 3–5 mm. Flowers heterostylous. Pedicel 1.5–2.5 cm, glandular pubescent. Calyx campanulate, 8–9.5 mm, sparsely glandular pubescent, parted nearly to middle; lobes triangular, ciliolate, apex subacuminate. Corolla blue; tube 1.3–1.4 cm, puberulent inside; limb ca. 2 cm wide; lobes cuneate-oblong, apex retuse. Pin flowers: stamens ca. 5 mm above base of corolla tube; style slightly exerted. Thrum flowers unknown. Capsule discoid, shorter than calyx. Fl. Apr.

* Mountain woodlands. Yunnan (Yongsheng Xian).

116. *Primula secundiflora* Franchet, Bull. Soc. Bot. France 32: 267. 1885.

偏花报春 pian hua bao chun

Primula vittata Bureau & Franchet.

Herbs perennial. Leaves a rosette; petiole short or occasionally ca. as long as leaf blade, broadly winged; leaf blade oblong to narrowly elliptic or oblanceolate, 5–15 × 1–3 cm, tapered toward base, sparsely minutely glandular, margin hydathode-denticulate, apex subrounded to acute. Scapes 10–60 (–90) cm, white farinose toward apex; umbels 1(or 2), superimposed, 5–10-flowered; bracts 5–10 mm. Flowers secund, heterostylous. Pedicel nodding at anthesis, 1–5 cm, ± farinose. Calyx tinged with purple from lobes to base, tubular-campanulate, 7–10 mm, upper 1/2 parted, white farinose between lobes, forming 5 purple and 5 white vertical stripes; lobes lanceolate to triangular-lanceolate. Corolla rose-purple to deep rose; limb 1.5–2.5 cm wide; lobes obovate-oblong, apex rounded to slightly emarginate. Pin flowers: corolla tube 9–10 mm; stamens slightly below middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube 1–1.3 cm; stamens toward apex of corolla tube; style 2–3 mm. Capsule elliptic, ca. 1.5 × as long as calyx. Fl. Jun–Jul, fr. Aug–Sep. $2n = 22^*$.

* Gullies, wet meadows, bog margins; 3200–4800 m. E Qinghai, W Sichuan, E Xizang, NW Yunnan.

117. *Primula miyabeana* T. It_ & Kawakami, Miyabe-Festschrift 1. 1911.

玉山灯台报春 yu shan deng tai bao chun

Herbs perennial. Leaves in a rosette; petiole 1/3–1/2 as long as leaf blade, broadly winged; leaf blade obovate-elliptic to oblanceolate, 10–20 × 3–5 cm, tapered to base, margin irregularly denticulate, apex rounded. Scapes 20–45 cm, efarinose; umbels 2–4, superimposed, 6–10-flowered; bracts linear, 1–2 cm. Flowers homostylous. Pedicel 1.5–3(–4) cm. Calyx campanulate, 5–7 mm, yellow farinose inside, parted 1/3 to near middle; lobes triangular, apex acuminate. Corolla purple; tube 9–10 mm; limb ca. 1.5 cm wide; lobes oblong, ca. 5 mm, margin crenate-serrate, apex emarginate. Stamens ca. 7 mm above base of corolla tube; style reach base of anthers. Capsule globose, nearly as long as calyx. Fl. Jun–Jul. $2n = 22^*$.

* Damp areas in forests; 2500–3500 m. Taiwan.

118. *Primula pulverulenta* Duthie, Gard. Chron., S開. 3, 38: 259. 1905.

粉被灯台报春 fen bei deng tai bao chun

Primula japonica f. *robusta* Hemsley; *P. shihmienensis* Fang.

Herbs perennial. Leaves in a rosette; petiole winged, 1/3–1/2 as long as leaf blade; leaf blade elliptic to elliptic-oblanceolate, 7–18 × 4–8(–10) cm, tapered to base, margin irregularly dentate, apex rounded; veins 11–15 pairs, at nearly right angles to midvein, then ascending to margin. Scapes 25–50 cm, elongated to 1 m in fruit, ± farinose on nodes; umbels 3 or 4, superimposed, 4–12-flowered; bracts linear to linear-lanceolate, 1.2–1.5 cm. Flowers heterostylous. Pedicel 1–2 cm. Calyx campanulate, 5–8 mm, white or cream-colored farinose, parted nearly to middle; lobes triangular, apex sub-

late. Corolla rose-purple, with a red or purple eye; limb 2–3 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube ca. 1.3 cm; stamens 7–8 mm above base of corolla tube; style 1.1–1.2 cm. Thrum flowers: corolla tube 1.4–1.5 cm; stamens 1.1–1.2 cm above base of corolla tube; style ca. 5 mm. Capsule globose, ca. as long as calyx. Fl. May–Jun. $2n = 22^*$.

* Wet meadows; 2200–2500 m. W Sichuan (Kangding Xian, Shimian Xian).

119. *Primula beesiana* Forrest, Gard. Chron., S開. 3, 50: 242. 1911.

霞红灯台报春 xia hong deng tai bao chun

Primula burmanica I. B. Balfour & Kingdon-Ward; *P. leucantha* I. B. Balfour & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1/4–1/2 as long as leaf blade; leaf blade narrowly oblong-oblanceolate to elliptic-oblanceolate, 8–20 × 2–6 cm, abaxially sparsely glandular, base attenuate, margin denticulate, apex rounded; lateral veins more than 10 pairs, at ca. 45_ to midvein. Scapes 20–35 cm, elongated to 50 cm in fruit, efarinose or white farinose on nodes; umbels 2–4(–8), superimposed, 8–16-flowered; bracts linear, to 2.5 cm at lowest umbel, gradually reduced upward and shorter than pedicel. Flowers heterostylous. Pedicel 1–2 cm, efarinose or scarcely farinose. Calyx campanulate, 5–8 (–9) mm, densely cream-colored farinose inside, scarcely farinose or efarinose outside, parted to middle or below; lobes lanceolate, apex acuminate. Corolla rose, rarely white, with a yellow eye; tube orange, ca. 1.2 cm; limb ca. 2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 5 mm above base of corolla tube; style ca. 1 cm. Thrum flowers: stamens ca. 8.5 mm above base of corolla tube; style ca. 5 mm. Capsule globose, shorter than calyx. Fl. Jun–Jul. $2n = 22$.

Streamsides, wet meadows; 2400–2800 m. SW Sichuan, N Yunnan [N Myanmar].

120. *Primula stenodonta* I. B. Balfour ex W.W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 33: 120. 1941.

凉山灯台报春 liang shan deng tai bao chun

Primula angustidens (Franchet) Pax; *P. japonica* A. Gray var. *angustidens* Franchet; *P. poissonii* Franchet subsp. *angustidens* (Franchet) Pax ex W.W. Smith & Forrest.

Herbs perennial, efarinose. Leaves in a rosette; petiole nearly obsolete or to 5 cm, broadly winged; leaf blade oblanceolate to obovate-elliptic, 5–8 × 1.8–4 cm, abaxially minutely glandular, base attenuate, margin ± regularly denticulate, apex rounded. Scapes 20–45 cm; umbels 3 or 4, superimposed; 5–10-flowered; bracts linear, 5–10 mm. Flowers heterostylous. Pedicel 0.7–1.3 cm. Calyx tubular-campanulate, 5–6 mm, parted to middle; lobes lanceolate, apex acuminate-subulate. Corolla bright red; tube 1.3–1.4 cm; limb 1–1.5 cm wide; lobes obovate, ca. 6 × 5.5 mm, deeply emarginate. Pin flowers: stamens ca. 4.5 mm above base of corolla tube; style 8–9 mm. Thrum flowers: stamens ca. 1 cm

above base of corolla tube; style ca. 4.5 mm. Capsule globose, included in calyx. Fl. Jun–Jul.

* Wetlands; ca. 2500 m. SW Sichuan, NE Yunnan.

121. *Primula mallophylla* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 181. 1916.

川东灯台报春 chuan dong deng tai bao chun

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole broadly winged, indistinct to 1/5 as long as leaf blade; leaf blade oblong to oblong-obovate, 12–18 × 4–6.5 cm, base attenuate, margin erose-denticulate, apex rounded to obtuse. Scapes to 30 cm; umbels 2 or 3, superimposed, 8–15-flowered; bracts 2.5–3 mm, outer narrowly elliptic and leaflike, inner linear to linear-lanceolate. Flowers heterostylous. Pedicel ca. 1.2 cm. Calyx tubular-campanulate, 1–1.4 cm, parted below middle; lobes narrowly lanceolate, 7–10 mm. Corolla pale rose-purple; limb ca. 1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube ca. 1.3 cm, slightly longer than calyx; stamens at middle of corolla tube; style exerted. Thrum flowers: corolla tube ca. 2 × as long as calyx; stamens near annulus; style ca. 9 mm. Capsule unknown.

* E Sichuan (Chengkou Xian).

122. *Primula anisodora* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 147. 1916.

茴香灯台报春 hui xiang deng tai bao chun

Herbs perennial, efarinose, glabrous, aromatic. Leaves in a rosette; petiole broadly winged, indistinct to 1/3 as long as leaf blade; leaf blade obovate-oblong to oblanceolate, 10–18 (–25) × 4–6(–8) cm, base attenuate, margin denticulate, apex obtuse to rounded. Scapes 30–60 cm; umbels 3–5, superimposed, 6–10-flowered; bracts linear to linear-lanceolate, 0.5–1.5 cm. Flowers heterostylous. Pedicel 1–1.5 cm. Calyx cupular, 4–6 mm, parted to 1/3; lobes broadly ovate-triangular, apex obtuse to rounded. Corolla dark purple when young, funnellform; tube ca. 9 mm; limb concave, 1–1.5 cm wide; lobes subquadrangular, 3–4(–5) × 5–6 mm, apex subtruncate to slightly emarginate. Pin flowers: stamens 2.5–3 mm above base of corolla tube; style ca. 7 mm. Thrum flowers with positions reciprocal. Capsule ovoid, slightly longer than calyx. Fl. May–Jun. $2n = 22$.

* Wet alpine meadows; 3200–3700 m. SW Sichuan, NC to NW Yunnan.

123. *Primula wilsonii* Dunn, Gard. Chron., S開. 3, 31: 413. 1902.

香海仙花 xiang hai xian hua

Primula glycyosma Petitmengin; *P. oblanceolata* I. B. Balfour; *P. poissonii* Franchet subsp. *wilsonii* (Dunn) W. W. Smith & Forrest.

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole conspicuously winged, indistinct to nearly as long as leaf blade; leaf blade obovate-oblong to oblanceolate, 5–12 (–20) × 1.5–5(–6) cm, base attenuate, margin finely denticulate, apex rounded. Scapes 30–50 cm, elongated to 90 cm in fruit; umbels 3–6, superimposed, 4–10(–16)-flowered; bracts

linear, 5–10 mm. Flowers heterostylous. Pedicel 1–2 cm. Calyx campanulate, 3.5–5.5 mm, parted to 1/3; lobes ovate-triangular, apex acute to subobtusate. Corolla rose-purple; tube ca. 1 cm; limb 1–1.5 cm wide, ± concave; lobes suborbicular to broadly obovate, 3–6 mm wide, emarginate at apex. Pin flowers: stamens 1.5–2 mm above base of corolla tube; style ca. 7 mm. Thrum flowers: stamens ca. 5 mm above base of corolla tube; style ca. 1 mm. Capsule ovoid, slightly longer than calyx. Fl. May–Jul. $2n = 22^*$.

* Wetlands, marshes, streamsides; 2000–3300 m. W Sichuan, Yunnan.

124. *Primula poissonii* Franchet, Bull. Soc. Bot. France 33: 67. 1886.

海仙花 hai xian hua

Primula planiflora Handel-Mazzetti.

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole indistinct or sometimes nearly as long as leaf blade, broadly winged; leaf blade obovate-elliptic to oblanceolate, (2.5–)4–10(–13) × 1.2–5 cm, strongly tapered to base, margin regularly denticulate, apex rounded. Scapes 20–45 cm, elongated to 60 cm in fruit; umbels 2–6, superimposed, 3–10-flowered; bracts linear-lanceolate, 5–10 mm. Flowers heterostylous. Pedicel 1–2 cm. Calyx campanulate, ca. 5 mm, parted to 1/3; lobes triangular to oblong, apex subobtusate. Corolla deep purplish crimson or rose-purple; tube 0.9–1.1 cm; limb spreading, 1.8–3 cm wide; lobes obovate to suborbicular, 8–9.5 × 6–8 mm, apex usually 2-cleft. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. 6.5 mm. Thrum flowers with positions reciprocal. Capsule ovoid, slightly longer than calyx. Fl. May–Jul. $2n = 22^*$.

* Wet areas, inundated meadows; 2500–3100 m. W Sichuan, C and N Yunnan.

125. *Primula bulleyana* Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 231. 1908.

桔红灯台报春 ju hong deng tai bao chun

Herbs perennial. Leaves in a rosette; petiole 1/4–1/2 as long as leaf blade, broadly winged; leaf blade elliptic-oblanceolate, 10–22(–30) × 3–8(–10) cm, tapered to base, margin irregularly denticulate, apex obtuse to rounded; lateral veins more than 15 pairs, at 45° to midvein. Scapes 20–70 cm, cream-yellow farinose toward apex and on nodes; umbels 5–7, superimposed, (4–)6–16-flowered; bracts linear, usually slightly longer than pedicel. Flowers heterostylous. Pedicel 1.3–2.5 cm, scarcely farinose. Calyx campanulate, 5–9.5 mm, scarcely farinose outside, densely cream-yellow farinose inside, parted to middle or slightly below; lobes lanceolate, apex acuminate-subulate. Corolla deep orange; limb ca. 2 cm wide; lobes oblong-obovate, slightly emarginate. Pin flowers: corolla tube 1–1.2 cm; stamens ca. 5 mm above base of corolla tube; style ca. 8.5 mm. Thrum flowers: corolla tube 1.4–1.5 cm; stamens ca. 1 cm above base of corolla tube; style ca. 5 mm. Capsule subglobose, nearly as long as calyx. Fl. Jun–Jul. $2n = 24^*$.

* Wet meadows; 2600–3200 m. SW Sichuan, NW Yunnan (Lijiang Xian).

126. *Primula smithiana* Craib, J. Roy. Hort. Soc. 39: 190. 1913.

亚东灯台报春 ya dong deng tai bao chun

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/3 as long as leaf blade; leaf blade oblong-oblong-oblanceolate to oblanceolate, 7–10 cm at anthesis, enlarged to 20 × 5–6.5 cm at fruiting, tapered to base, efarinose or yellow farinose abaxially, margin regularly fine denticulate, apex rounded. Scapes 20–65 cm; umbels 2–5, superimposed, 5–12-flowered; bracts linear-lanceolate, 4–10 mm. Flowers heterostylous. Pedicel ca. 2 × as long as bracts, pale yellow farinose. Calyx campanulate, 4–5 mm, copiously yellow farinose outside, parted to 1/3; lobes broadly triangular, apex acute. Corolla pale yellow; tube 8–11 mm; limb 1–1.5 cm wide; lobes obovate to oblong-obovate, ca. 5 × 4–4.5 mm. Pin flowers: stamens ca. 2 mm above base of corolla tube; style 6–7 mm. Thrum flowers: stamens 8–9.5 mm above base of corolla tube; style ca. 2 mm. Capsule globose, slightly longer than calyx. Fl. Jun–Sep. $2n = 22$.

Woodland margins, grasslands in river valleys; 2400–2700 m. S Xizang (Yadong Xian) [Bhutan].

127. *Primula helodoxa* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 171. 1916.

泽地灯台报春 ze di deng tai bao chun

Herbs perennial. Leaves in a rosette; petiole 1/4–1/2 as long as leaf blade, broadly winged; leaf blade broadly oblanceolate to obovate-oblong, 10–15 × 2–4 cm, tapered at base, efarinose or sparsely yellow farinose abaxially, margin denticulate, apex obtuse to rounded. Scapes 40–90 cm, elongated to 1.2 m in fruit, yellow farinose on nodes; umbels 4–6, superimposed, 6–12(–20)-flowered; bracts linear to linear-lanceolate, 0.7–1.5(–3) cm. Flowers heterostylous. Pedicel 1.3–2.5(–3.5) cm, ± yellow farinose. Calyx campanulate, 3.5–5 mm, copiously yellow farinose outside, parted to 1/3; lobes triangular, apex hydathe-apiculate. Corolla bright golden yellow; tube 1.2–1.8 cm; limb ca. 2.5 cm wide; lobes obovate, ca. 8 × 6 mm, distinctly emarginate. Pin flowers: corolla tube 1.2–1.3 cm; stamens ca. 2 mm above base of corolla tube; style 1–1.1 cm. Thrum flowers: corolla tube 1.3–1.8 cm; stamens 1.1–1.4 cm above base of corolla tube; style ca. 3 mm. Capsule globose, slightly shorter than calyx. Fl. Mar–May. $2n = 22^*$.

* Open wet grasslands, streamsides; ca. 2000 m. W Yunnan (Tengchong Xian).

128. *Primula cockburniana* Hemsley, J. Linn. Soc., Bot. 29: 313. 1892.

鹅黄灯台报春 e huang deng tai bao chun

Primula operculata R. Knuth.

Herbs biennial. Leaves in a rosette; petiole usually 1/5–1/2 as long as leaf blade; leaf blade oblong to oblong-obovate, 5–10(–12) × 1.6–4.8 cm, abaxially sparsely minutely glandular, base subrounded to broadly cuneate, margin obscurely repand and finely denticulate, apex rounded. Scapes 15–30 cm, elongated to 50 cm in fruit, cream-yellow farinose on nodes; umbels (1 or)2–4(or 5), superimposed; 3–8-flowered; bracts

lanceolate, 3–5 mm, cream-colored farinose. Flowers homostylous. Pedicel 1–1.5 mm, elongated to 2–3 cm in fruit. Calyx campanulate, ca. 4 mm, parted to 1/3; lobes triangular, copiously cream-yellow farinose inside, scarcely farinose outside. Corolla dark orange or tinged with red; tube 1–1.1 cm; limb ca. 1.5 cm wide; lobes oblong-obovate, 5–7 × 3–4.5 mm, emarginate. Stamens ca. 8 mm above base of corolla tube. Style slightly longer than anthers. Capsule oblong, slightly longer than calyx. Fl. Jun–Jul. $2n = 22^*$.

* Moist meadows, margins of woodlands and thickets; 2900–4200 m. W Sichuan.

129. *Primula chungensis* I. B. Balfour & Kingdon-Ward in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 7. 1920.

中甸灯台报春 zhong dian deng tai bao chun

Herbs perennial. Leaves in a rosette; petiole to 1/4 as long as leaf blade; leaf blade elliptic to oblong or obovate-oblong, 4.5–15(–20) × 2–5(–8) cm, base cuneate-attenuate, margin obscurely sinuate-lobulate, irregularly denticulate, apex rounded. Scapes 15–20 cm, elongated to 80 cm in fruit, scarcely farinose at nodes; umbels (1 or)2–5, superimposed, 3–12-flowered; bracts triangular to lanceolate, 1.5–3.5(–5) mm, scarcely farinose. Pedicel 0.8–1.5 cm, elongated to 2.8 cm in fruit. Flowers mostly homostylous, rarely heterostylous. Calyx campanulate, 3.5–4.5 mm, copiously yellow farinose inside, efarinose or scarcely farinose outside, parted to 1/3 or slightly below; lobes triangular, apex acute. Corolla pale orange; tube 1.1–1.2 cm; limb 1.5–2 cm wide; lobes obovate, slightly emarginate. Stamens ca. 9 mm above base of corolla tube. Style slightly longer than anthers. Capsule ovoid, slightly longer than calyx. Fl. May–Jun. $2n = 22^*$.

* Mountain glades, marshes; 2900–3200 m. SW Sichuan, SE Xizang, NW Yunnan.

130. *Primula aurantiaca* W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 34. 1923.

橙红灯台报春 cheng hong deng tai bao chun

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole to 1/3 as long as leaf blade; leaf blade obovate-oblong to oblanceolate, 4–15 × 1.8–5 cm, base attenuate, decurrent to petiole, margin erose-denticulate, apex rounded. Scapes 4.5–15 cm at anthesis, elongated to 30 cm in fruit; umbels 2–4 (–6), superimposed, 6–12-flowered; bracts linear, 1–2.2 cm. Flowers heterostylous. Pedicel reddish, 3–10 mm. Calyx tubular-campanulate, 7–10 mm, parted slightly below middle; lobes lanceolate. Corolla deep reddish orange; limb 8–10 mm wide; lobes oblong-obovate, emarginate. Pin flowers: corolla tube 8–10 mm; stamens ca. 5.5 mm above base of corolla tube; style ca. 9 mm. Thrum flowers: corolla tube 0.9–1.4 cm; stamens ca. 1.2 cm above base of corolla tube; style ca. 5 mm. Capsule subglobose, ca. 5 mm in diam., ca. as long as calyx. Fl. May. $2n = 22$.

* Wet meadows, damp forest margins; 2500–3500 m. SW Sichuan, NW Yunnan.

131. *Primula prenantha* I. B. Balfour & W.W. Smith in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 191. 1916.

小花灯台报春 xiao hua deng tai bao chun

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole indistinct to 1/3 as long as leaf blade; leaf blade oblong-ovate to obovate-elliptic, 3.5–9 × 1.5–3 cm, base attenuate, margin erose-denticulate, apex rounded. Scape 10–15 cm, elongated to 20 cm in fruit; umbels 1 or 2, superimposed, 2–8-flowered; bracts linear to linear-lanceolate, 3–8 mm. Flowers homostylous. Pedicel 0.5–1.5(–2) cm. Calyx campanulate, 3–5.5 mm, parted at most to 1/3; lobes triangular, margin entire, rarely 1- or 2-toothed. Corolla yellow; limb 6–10(–12) mm wide.

Wet and alpine meadows, bog margins; 2400–4000 m. SE Xizang, NW Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

- 1a. Mature corolla limb 6–9 mm wide; lobes oblong-ovate, not spreading 131a. subsp. *prenantha*
1b. Mature corolla limb 9–12 mm wide; lobes obovate, ± spreading 131b. subsp. *morsheadiana*

131a. *Primula prenantha* subsp. *prenantha*

小花灯台报春(原亚种) xiao hua deng tai bao chun (yuan ya zhong)

Primula microloma Handel-Mazzetti.

Corolla tube 5–7.5 mm; limb 6–9 mm wide; lobes oblong-ovate, 2–3.5 mm. Stamens ca. 5.5 mm above base of corolla tube. Style to as long as anthers. Capsule subglobose, ca. 5 mm in diam., ca. as long as calyx. Fl. May–Jun.

Wet meadows, bog margins; 2400–3300 m. SE Xizang, NW Yunnan [Bhutan, NE India, N Myanmar, Nepal].

131b. *Primula prenantha* subsp. *morsheadiana* (Kingdon-Ward) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 126. 1990.

朗贡灯台报春 lang gong deng tai bao chun

Primula morsheadiana Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 70. 1926.

Corolla tube 7–11 mm; limb 0.9–1.2 cm wide; lobes ± spreading, obovate, 4–5 mm. Stamens 5–7 mm above base of corolla tube. Style 5–7.5 mm, longer than anthers. $2n = 22^*$.

* Alpine meadows; 3500–4000 m. SE Xizang.

132. *Primula chrysochlora* I. B. Balfour & Kingdon-Ward in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 155. 1916.

腾冲灯台报春 teng chong deng tai bao chun

Primula helodoxa I. B. Balfour subsp. *chrysochlora* (I. B. Balfour & Kingdon-Ward) W.W. Smith & Forrest.

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole indistinct to 1/4 as long as leaf blade; leaf blade oblong to obovate-elliptic, 6–13 × 3–5 cm, base attenuate, margin irregularly denticulate at base, apex rounded. Scapes 20–65 cm; umbels 3 or 4, superimposed, 9–13-flowered; bracts linear, 7–10(–20) mm. Flowers heterostylous. Pedicel 1–1.3 cm. Calyx campanulate, 4.5–4.8 mm, parted to 1/3; lobes

triangular, margin hydathode-apiculate, apex subacuminate. Corolla yellow; tube 9–10.5 mm, cylindric, amplified near mouth; limb 1–1.5 mm wide; lobes obovate-oblong, ca. 5 × 4.5 mm, slightly emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. 9.5 mm. Thrum flowers with positions reciprocal. Capsule globose, included in calyx.

* Woodlands bordering streams, marshes; 1600–1800 m. W Yunnan (Tengchong Xian).

133. *Primula melanodonta* W. W. Smith in W. W. Smith & Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 303. 1927.

芒齿灯台报春 mang chi deng tai bao chun

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole indistinct to 1/3 as long as leaf blade; leaf blade oblanceolate to elliptic-obovate, 3–5 × 1.5–2 cm, base attenuate, margin regularly fine dentate, apex rounded to obtuse. Scapes 14–25 cm; umbels 1(or 2), superimposed, 2–5-flowered; bracts purplish, linear-lanceolate, 3–5 mm. Flowers heterostylous. Pedicel 5–13 mm, elongated to 2 cm in fruit. Calyx campanulate, 6–7.5 mm, parted to 1/3 or slightly below, 5-veined; lobes purplish, triangular. Corolla yellow; tube 1–1.1 cm; limb to 2 cm wide; lobes broadly obovate, 5–8 mm. Pin flowers: stamens near base of corolla tube; style ca. as long as calyx. Thrum flowers with positions reciprocal. Capsule globose, included in calyx. Fl. Aug. $2n = 22$.

Wet meadows; 3500–4000 m. NW Yunnan [N Myanmar].

134. *Primula serratifolia* Franchet, Bull. Soc. Bot. France 32: 267. 1885.

齿叶灯台报春 chi ye deng tai bao chun

Primula biserrata Forrest.

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole to 1/3 as long as leaf blade; leaf blade oblong to elliptic-obovate, 6–12 × 1.8–5 cm, base attenuate, margin erose-denticulate, apex rounded. Scapes 12–25(–45) cm; umbels 1 to several, superimposed, (3–)5–10-flowered; bracts linear-lanceolate, 3–10 mm. Flowers heterostylous. Pedicel 0.8–2 cm, elongated to 3 cm in fruit. Calyx tubular-campanulate, parted 1/3–1/2, 5-ribbed; lobes triangular, margin hydathode-apiculate at apex. Corolla yellow; limb 1.8–2.5 cm wide; lobes broadly obovate, margin entire to emarginate at apex, usually with a deep yellow stripe from base to apex. Pin flowers: corolla tube 8–10 mm, gradually expanded upward; stamens 3–4 mm above base of corolla tube; style exerted. Thrum flowers: corolla tube ca. 9 mm, abruptly expanded at insertion of stamens (near annulus); style ca. 2.5 mm. Capsule ovoid, nearly as long as calyx. Fl. Jun, fr. Sep. $2n = 22^*$.

Wet meadows; 2600–4200 m. SE Xizang, NW Yunnan [N Myanmar].

135. *Primula faberi* Oliver, Hooker's Icon. Pl. 18: t. 1789. 1888.

娥眉报春 e mei bao chun

Primula cylindriflora Handel-Mazzetti; *P. lecomtei* Petitmengin.

Herbs perennial, efarinose, glabrous. Leaves in a rosette; petiole indistinct to 3 cm, winged with decurrent leaf blade; leaf blade elliptic to oblong or oblanceolate, 2–8 × 0.6–3 cm, base attenuate, margin irregularly sharp dentate, apex acute to subobtusate, sparsely minutely brown punctate. Scape 5–20 cm, densely glandular toward apex; umbels compact, 3–10-flowered; bracts ovate to ovate-oblong, 0.6–1.5 cm × 2–5 mm, leaflike, margin entire or with 1 or 2 teeth. Flowers heterostylous. Pedicel 1–2 mm. Calyx campanulate, 7–10 mm, parted to ± middle, 5-veined; lobes oblong, apex acute to subobtusate. Corolla yellow, tubular-campanulate, 1.8–2.5 cm; limb 1.2–1.5 cm wide; lobes erect, oblong, 5–8 × 4–5.5 mm, apex rounded to apiculate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. 7 mm. Thrum flowers: stamens ca. 5 mm above base of corolla tube; style ca. 1 mm. Capsule oblong, slightly shorter than calyx. Fl. Jun–Jul, fr. Jul–Aug.

* Wet pastures; 2100–3500 m. SW Sichuan, NE Yunnan.

136. *Primula dickieana* Watt, J. Linn. Soc., Bot. 20: 9. 1882.

展瓣紫晶报春 zhan ban zi jing bao chun

Primula dickieana var. *chlorops* W.W. Smith & Forrest; *P. dickieana* var. *pantlingii* (Kingdon-Ward) W.W. Smith; *P. pantlingii* Kingdon-Ward.

Herbs perennial, efarinose, glabrous, base with few lanceolate to linear bud scales. Petiole winged, ca. 1/5 to as long as leaf blade; leaf blade elliptic-obovate to oblanceolate, 1.5–7 cm × 3–10 mm, tapered at base, margin subentire to remotely denticulate, apex subacute. Scapes 8–20 cm; umbels 1–6-flowered; bracts linear, 1–3.5(–5) mm, often slightly above base of pedicel. Flowers heterostylous. Pedicel 1–7 mm, elongated to 2.5 cm in fruit. Calyx tubular-campanulate, 6.5–8 mm, parted to 1/3 or near middle; lobes triangular, apex subobtusate. Corolla yellow, white, or purple, funnel-form; tube 3–4 × as long as calyx, pubescent at mouth and inside; limb spreading, 2–3 cm wide; lobes obcordate to oblong, 7–8 mm, 2-lobulate. Pin flowers with stamens ca. 4 mm above corolla tube. Thrum flowers with positions reciprocal. Capsule ovoid, nearly as long as calyx. Fl. Jun–Jul.

Wet meadows; 4000–5000 m. SE Xizang [Bhutan, NE India, Myanmar, Nepal, Sikkim].

137. *Primula odontica* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 199. 1937.

粗齿紫晶报春 cu chi zi jing bao chun

Herbs perennial, efarinose, glabrous. Bud scales ovate to lanceolate. Leaf blade oblanceolate to elliptic or lanceolate, 5–7 × 1.5–2.5 cm, base tapered into a short winged petiole, margin irregularly dentate, spreading or slightly runcinate, apex acute to subacuminate. Scapes 9–12 cm; umbels 3–6(–10)-flowered; bracts linear, 4–10 mm. Flowers heterostylous. Pedicel 1–2 cm. Calyx green but tinged with purple, cupular, 6–7 mm, parted nearly to middle; lobes lanceolate to subtriangular, apex acute. Corolla deep wine red, campanulate, 1.5–1.7 × 1.5–1.7 cm, with a very short cylindrical base and abruptly expanded upper part; lobes oblong, ca. 6 mm, margin entire or slightly

emarginate, adaxially puberulent. Pin flowers: stamens 2–3 mm above base of corolla tube; style ca. 5 mm. Capsule ovoid, nearly as long as calyx. Fl. Jun–Jul.

* Open hillsides, steep grassy slopes; 4300–5000 m. SE Xizang.

138. *Primula virginis* H. L. Reiche, Monde Pl. 17(92): 1. 1915.

乌蒙紫晶报春 wu meng zi jing bao chun

Primula leimonophila I. B. Balfour; *P. petrophyes* I. B. Balfour.

Herbs perennial, efarinose, glabrous, with remains of old leaves and few lanceolate bud scales at base. Leaves in a rosette; petiole 0.5–1.5 cm, winged by decurrent leaf blade; leaf blade lanceolate to narrowly elliptic-lanceolate, 1.5–5 × 0.5–1.4 cm, tapered to base, sparsely minutely brown punctate, margin remotely denticulate or sometimes subentire, apex acute. Scapes 6–12(–22) cm; umbels 1(or 2), superimposed, 2–4-flowered; bracts linear-lanceolate, 4–8 mm. Flowers heterostylous. Pedicel 3–8(–13) mm. Calyx subcylindric, 5–7 mm, parted to ca. middle or slightly below, 5-veined; lobes narrowly lanceolate, apex acute to subobtusate. Corolla blue-purple, 1.5–1.8 cm, with a cylindrical base nearly as long as calyx, upper part expanded and campanulate; limb ca. 1.3 cm wide; lobes oblong, ca. 4–5 mm, apex subtruncate to slightly emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style 7–7.5 mm. Thrum flowers with positions reciprocal. Capsule ovoid, nearly as long as calyx. Fl. May–Jun.

* Mossy rocks in damp valleys; 3300–3700 m. NE Yunnan (Qiaojia Xian).

139. *Primula silaensis* Petitmengin, Bull. Herb. Boissier, S. 2, 7: 524. 1907.

贡山紫晶报春 gong shan zi jing bao chun

Herbs perennial, efarinose, glabrous, each forming a dense tuft consisting of many rosettes. Leaves usually 4 or 5 per rosette; petiole ca. 1/2 to sometimes nearly as long as leaf blade; leaf blade obovate to oblong-obovate, rarely mucronate, 1–2 × 0.5–1.5 cm, base cuneate, margin sharply denticulate, apex rounded. Scapes 5–10 cm, umbels 1- or 2(–5)-flowered; bracts linear-lanceolate, 2–3 mm. Flowers heterostylous. Pedicel 2.5–5 mm. Calyx campanulate, ca. 4 × 4 mm, parted nearly to middle; lobes ovate to ovate-lanceolate, apex obtuse to acute. Corolla pale rose-purple to deep blue-purple, campanulate, 0.8–1.2 cm, base cylindrical, nearly as long as calyx, upper part expanded and campanulate; limb 1–1.3 cm wide; lobes 3–4.5 × 4–5 mm, slightly emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. 4.5 mm. Thrum flowers with stamens ca. 4 mm above base of corolla tube; style ca. 1.5 mm. Capsule ovoid, nearly as long as calyx. Fl. Aug.

Wet areas, among rocks in alpine meadows; 3600–4800 m. NW Yunnan [NE India, Myanmar].

140. *Primula amethystina* Franchet, Bull. Soc. Bot. France 32: 268. 1885.

紫晶报春 zi jing bao chun

Herbs perennial, efarinose, with few scales at base. Leaves in a rosette; petiole winged, indistinct to 1.5 cm; leaf blade el-

liptic-oblong to obovate-oblong, occasionally acute, 2–4.5 × 1–2 cm, firm papery when dry, sparsely brown punctate, base cuneate, margin remotely denticulate to dentate, apex rounded to obtuse. Scapes 5–25 cm, umbels 2–6(–20)-flowered; bracts ovate-lanceolate to linear-lanceolate, 2–5 mm. Flowers heterostylous. Pedicel 0.1–2 cm. Calyx campanulate, 4–5(–6) mm, parted nearly to middle; lobes ovate to ovate-lanceolate, apex obtuse to acute. Corolla violet, campanulate to tubular-campanulate, 1.2–1.6 cm; limb 0.6–1.8 cm wide; lobes subquadrate, apex obscurely emarginate to lacerate-incised. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. 4.5 mm. Thrum flowers with stamens ca. 4.5 mm above base of corolla tube; style ca. 1.2 mm. Capsule ovoid, ca. as long as calyx.

* Alpine meadows; 3400–5000 m. W Sichuan, Xizang, Yunnan.

- 1a. Corolla lobes obscurely emarginate, with a mucronate notch 140a. subsp. *amethystina*
- 1b. Corolla lobes irregularly lacerate-incised, with teeth more than 1 mm.
 - 2a. Corolla campanulate, at least 1 cm in diam., tube with a short cylindrical base, abruptly dilated above 140b. subsp. *argutidens*
 - 2b. Corolla tubular-campanulate, 0.6–1 cm in diam., gradually dilated upward from base 140c. subsp. *brevifolia*

140a. *Primula amethystina* subsp. *amethystina*

紫晶报春(原亚种) *zi jing bao chun* (yuan ya zhong)

Leaf margin remotely fine denticulate. Scapes 5–15 cm; umbels 2–6-flowered. Pedicel 0.5–1.5 cm. Corolla campanulate, 1.2–1.5 cm in diam., abruptly dilated from a short cylindrical base; lobes 4–5(–6) mm wide, obscurely emarginate, with a mucronate notch. Fl. Jun–Jul.

* Wet meadows on mountain summit; ca. 4000 m. Yunnan (Cang Shan, Dali Xian).

140b. *Primula amethystina* subsp. *argutidens* (Franchet) W. W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 33: 213. 1942.

尖齿紫晶报春 *jian chi zi jing bao chun*

Primula argutidens Franchet, J. Bot. (Morot) 9: 451. 1895; *P. riae* Pax & K. Hoffmann.

Leaf margin conspicuously dentate. Scapes 5–10(–13) cm; umbels 2–4-flowered. Pedicel 1–3(–5) mm. Corolla campanulate, 1–1.5(–1.8) cm in diam., abruptly dilated from a short cylindrical base; lobes irregularly lacerate-incised at apex. Fl. Jun–Jul.

* Alpine meadows; 3500–5000 m. W Sichuan.

140c. *Primula amethystina* subsp. *brevifolia* (Forrest) W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 13. 1928.

短叶紫晶报春 *duan ye zi jing bao chun*

Primula brevifolia Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 229. 1908; *P. sikangensis* Chen.

Leaf margin remotely fine denticulate. Scapes 8–16(–25) cm; umbels 3–20-flowered. Pedicel 0.2–2 cm. Corolla tubular-campanulate, 6–10 mm in diam., gradually dilated from base; lobes irregularly lacerate-incised, appearing fringed. Fl. Jun–Jul.

* Wet meadows; 3400–5000 m. W Sichuan, E Xizang, NW Yunnan.

141. *Primula valentiniana* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 59: 249. 1922.

暗红紫晶报春 *an hong zi jing bao chun*

Herbs perennial, efarinose. Leaves in a rosette; petiole narrowly winged, ca. 1/2 as long as leaf blade; leaf blade obovate to oblanceolate, 1.5–3 × 5–10 cm, base cuneate, margin remotely denticulate, apex acute or occasionally subobtusate and mucronate. Scapes 2.5–7(–10) cm, usually 1- or 2-flowered; bracts usually 2, alternate, 2–8 mm. Flowers secund, heterostylous. Pedicel 2–10 mm. Calyx tinged with purple, cupular, 3.5–5 mm, parted nearly to middle; lobes triangular to ovate-triangular. Corolla deep wine red, broadly campanulate, pubescent inside, 1.4–1.8 cm, base cylindrical, ca. 1 mm, expanded abruptly above; limb 1.4–1.6 cm wide; lobes ca. 6 × 6 mm, apex rounded, margin entire, undulate to slightly emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style 6–7 mm. Thrum flowers: stamens 4–5 mm above base of corolla tube; style 2–3 mm. Capsule ca. as long as to slightly longer than calyx. Fl. Jul–Aug.

Alpine meadows, peat soils; 3800–4200 m. E Xizang, NW Yunnan [Myanmar].

142. *Primula kingii* Watt, J. Linn. Soc., Bot. 20: 9. 1882.

高葶紫晶报春 *gao ting zi jing bao chun*

Primula dickieana Watt var. *gouldii* H. R. Fletcher.

Herbs perennial, efarinose, glabrous, with few oblong bud scales at base. Petiole winged; leaf blade elliptic-lanceolate to lanceolate, 2–6 × 5–10 mm, base cuneate, margin entire to remotely denticulate, apex acute. Scapes 10–20 cm, elongated to 30 cm in fruit; umbels 2–10-flowered; bracts subulate, 3–10 mm. Flowers heterostylous. Pedicels unequal, 0.5–2 cm. Calyx narrowly campanulate, 6–8 mm, parted 1/3–1/2; lobes triangular, apex acute. Corolla dark wine red, narrowly campanulate, 1.3–2.2 cm, glabrous inside, with a cylindrical base nearly as long as calyx and an expanded campanulate upper part; limb 1.5–1.8 cm wide, puberulent; lobes elliptic to oblong, ca. 5 mm, margin entire, apex retuse or slightly retuse. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. 8 mm. Thrum flowers: stamens 0.9–1.2 cm above base of corolla tube; style ca. 5 mm. Capsule ovoid, nearly as long as calyx. Fl. Jun.

Alpine meadows; ca. 4000 m. SE Xizang [Bhutan, NE India, Sikkim].

143. *Primula sikkimensis* J. D. Hooker, Bot. Mag. 77: t. 4597. 1851.

钟花报春 *zhong hua bao chun*

Primula microdonta Franchet ex Petitmengin; *P. microdonta* var. *alpicola* W. W. Smith f. *micromeres* W. W. Smith; *P. pseudosikkimensis* Forrest; *P. pudibunda* W. W. Smith; *P. sikkimensis* subsp. *pseudosikkimensis* (Forrest) W. W. Smith & Forrest; *P. sikkimensis* subsp. *pudibunda* (W. W. Smith) W. W. Smith & Forrest; *P. sikkimensis* var. *hookeri* Stapf; *P. sikkimensis* var. *lorifolia* W. W. Smith; *P. sikkimensis* var. *pudibunda* (W. W. Smith) W. W. Smith & H. R. Fletcher.

Herbs perennial. Leaves in a rosette; petiole obscure or nearly as long as leaf blade; leaf blade elliptic to oblong or oblanceolate, 7–30(–40) × 2–7 cm, thin papery or submembranous, base attenuate, rarely obtuse or subrounded, margin crenate-serrate to dentate, apex rounded to occasionally acute; reticulate veins prominent abaxially. Scapes 15–90 cm, yellow farinose toward apex; umbels usually 1(or 2), 2- to many flowered; bracts lanceolate, 0.5–2 cm, base often gibbous, apex acuminate. Flowers heterostylous. Pedicel 1–6(–10) cm, yellow farinose. Calyx campanulate to tubular-campanulate, 7–10(–12) mm, copiously farinose; parted to ± middle, prominently 5-veined; lobes lanceolate to triangular-lanceolate, apex acute and slightly recurved. Corolla yellow, rarely cream-white, becoming dark green when dry, 1.5–2.5(–3) cm; tube slightly longer than calyx; limb (1–)1.5–3 cm wide; lobes obovate to obovate-oblong, margin entire to emarginate. Pin flowers: stamens 2–3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. Jun, fr. Sep–Oct. $2n = 18, 22$.

Wet meadows, margins of bogs and wet forests, streamsides; 3200–4400 m. W Sichuan, Xizang, NW Yunnan [Bhutan, NE India, Myanmar, Nepal, Sikkim].

144. *Primula chumbiensis* W. W. Smith, Trans. Bot. Soc. Edinburgh 26: 118. 1913.

厚叶钟报春 hou ye zhong bao chun

Herbs perennial. Leaves in a rosette; petiole nearly as long as to 2 × as long as leaf blade; leaf blade oblong to ovate-oblong or elliptic, 1–4 × 1–2 cm, firm papery or subleathery, base short cuneate, rounded, or cordate, margin crenate-serrate, apex rounded; reticulate veins ± obscure abaxially. Scapes 10–25 cm, scarcely farinose toward apex; umbels 2–7-flowered; bracts linear-lanceolate to subulate, 3–12 mm. Flowers heterostylous. Pedicel 1–4 cm, elongated to 8 cm in fruit, scarcely farinose. Calyx cylindrical to tubular-campanulate, 6–9 mm, scarcely farinose, densely reddish striate outside, parted to near middle, prominently 5-veined; lobes triangular-lanceolate, apex slightly recurved. Corolla yellow; limb 1–1.5 cm wide; lobes suberect, obovate to elliptic, margin entire to obscurely emarginate. Pin flowers: corolla tube ca. 9 mm; stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube ca. 1.1 cm; stamens toward apex of corolla tube; style ca. 2 mm. Capsule oblong, nearly as long as calyx. Fl. Aug.

Alpine meadows; 5000–5300 m. S Xizang (Yadong Xian) [Bhutan].

145. *Primula alpicola* (W. W. Smith) Stapf, Bot. Mag. 155: t. 9276. 1932.

杂色钟报春 za se zhong bao chun

Primula microdonta Franchet ex Petitmengin var. *alpicola* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 85. 1926; *P. alpicola* subsp. *luna* Stapf; *P. alpicola* subsp. *violacea* Stapf; *P. alpicola* var. *alba* W. W. Smith.

Herbs perennial, efarinose except for inflorescences. Leaves in a rosette; petiole nearly as long as to 2 × as long as leaf blade; leaf blade oblong to elliptic, 10–20 × 3–8 cm, thin papery, abaxially minutely glandular, adaxially glabrous, base truncate to rounded, sometimes cordulate to short cuneate, margin denticulate to crenulate, apex rounded. Scapes 15–90 cm, scarcely farinose toward apex; umbels 2–4, superimposed, 5- to many flowered; bracts green or reddish brown, lanceolate to oblong or ovate, 0.6–2 cm × 1.5–5(–8) mm, usually farinose. Flowers heterostylous. Pedicel 1–8 cm, pale yellow farinose. Calyx campanulate to tubular-campanulate, 7–10 mm, sparsely farinose outside, copiously yellow farinose inside, parted to 1/4–1/3, 5-veined; lobes triangular to lanceolate, apex acute and slightly recurved. Corolla yellow, purple, or white; tube 1.1–1.3 cm; limb 1.2–3 cm wide; lobes broadly obovate to suborbicular, emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 2 mm. Capsule cylindrical, slightly longer than calyx. Fl. Jul. $2n = 22$.

Streamsides, thickets, glades; 3000–4600 m. SE Xizang [Bhutan].

146. *Primula reticulata* Wallich in Roxburgh, Fl. Ind. 2: 21. 1824.

网叶钟报春 wang ye zhong bao chun

Herbs perennial. Leaves in a rosette; petiole 1–3 × as long as leaf blade; leaf blade ovate-oblong to oblong, 2–10 × 2–4.5 cm, glabrous or sparsely minutely glandular along veins abaxially, base shallowly cordate to rounded, margin dentate to crenate-dentate, apex rounded. Scapes 18–45 cm, scarcely farinose toward apex; umbels 4–12-flowered; bracts linear-lanceolate to lanceolate, 0.7–2 cm, occasionally dentate. Flowers heterostylous. Pedicel 1–5 cm, farinose. Calyx tubular-campanulate, 5–11 mm, sparsely pale yellow farinose outside, more densely so inside, parted to 1/3, prominently 5-veined; lobes slightly recurved, lanceolate, apex acute. Corolla white to cream-white or cream-yellow; tube 1–1.4 cm; limb 1–2 cm wide; lobes obovate to obovate-oblong, margin entire to obscurely emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube or slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style ca. 2 mm. Capsule cylindrical, ca. as long as to slightly longer than calyx. Fl. Jun. $2n = 22$.

Thickets on mountain slopes; ca. 3000 m. S Xizang (Nyalam Xian) [Bhutan, NE India, Nepal, Sikkim].

147. *Primula firmipes* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 10. 1920.

葶立钟报春 ting li zhong bao chun

Primula deleiensis Kingdon-Ward; *P. firmipes* subsp. *flexilipes* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. flexilipes* I. B. Balfour & Forrest.

Herbs perennial. Leaves in a rosette; petiole 2–20 cm, narrowly winged, vaginate at base; leaf blade ovate to ovate-oblong or suborbicular, 1–7 × 1–5 cm, abaxially sparsely minutely glandular, adaxially glabrous, base shallowly cordate, deeply crenate-dentate, apex rounded. Scapes 10–40 cm, scarcely yellow farinose toward apex; umbels 2–8-flowered; bracts lanceolate to ovate-lanceolate, 7–12 mm, margin often dentate. Flowers heterostylous. Pedicel 1–4 cm, glandular, sometimes farinose toward apex. Calyx campanulate, 5–8 mm, glandular, ± yellow farinose outside, parted to middle, 5-veined; lobes lanceolate to triangular-lanceolate, ciliate. Corolla yellow; tube ca. 1 cm; limb 1.3–2 cm wide; lobes obovate, 7–9 mm, suberect, emarginate to crenulate at apex. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1 mm. Capsule cylindrical, ca. as long as to slightly longer than calyx. Fl. May–Jun. $2n = 22$.

Wet stony meadows, streamsides, thicket margins; 3000–4500 m. SE Xizang, NE Yunnan [N Myanmar].

148. *Primula florindae* Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 84. 1926.

巨伞钟报春 ju san zhong bao chun

Herbs perennial, stout. Leaves in a rosette; petiole 3–30 cm; leaf blade broadly ovate-oblong to elliptic, 3–15(–20) × 4–11(–15) cm, thin papery, glabrous, abaxially sparsely minutely glandular, base cordate, margin hydathode-dentate, apex rounded. Scapes robust, 30–120 cm, glabrous or occasionally scarcely farinose toward apex; umbels (10–)15–30(–80)-flowered; bracts broadly lanceolate to oblong, 1–3 cm, often dentate, gibbous at base. Flowers heterostylous. Pedicel 2–10 cm, ± yellow farinose. Calyx campanulate, 8–10 mm, copiously yellow farinose, parted to ± 1/3, obscurely 5-veined; lobes triangular, apex acute. Corolla yellow, often becoming green when dry, 1.7–2.5 cm; limb 1–2 cm wide; lobes obovate-oblong to broadly obovate, slightly emarginate. Pin flowers: corolla tube slightly longer than calyx; stamens ca. 2.5 mm above base of corolla tube; style ca. as long as tube or slightly exserted. Thrum flowers: corolla tube ca. 2 × as long as calyx; stamens toward apex of corolla tube; style ca. 1.5 mm. Capsule cylindrical, slightly longer than calyx. Fl. Jun–Jul, fr. Jul–Aug. $2n = 22^*$.

* Streamsides, bog margins, wet areas in *Picea* forests; 2600–4000 m. E Xizang.

149. *Primula waltonii* Watt ex I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 57. 1915.

紫钟报春 zi zhong bao chun

Primula prionotes I. B. Balfour & Watt; *P. waltonii* subsp. *prionotes* (I. B. Balfour & Watt) W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole to nearly as long as leaf blade; leaf blade elliptic-oblong to oblanceolate, 3.5–18 × 1.2–4(–7) cm, efarinose, abaxially sparsely minutely

glandular, base cuneate-attenuate, margin erose-dentate, apex rounded. Scapes 18–70 cm, scarcely yellow farinose toward apex; umbels 4- to many flowered; bracts often tinged with purple, lanceolate to linear-lanceolate, 0.5–2 cm. Flowers heterostylous. Pedicel 1–7 cm, yellow farinose. Calyx often tinged with purple, campanulate, 5.5–8 mm, sparsely farinose outside, copiously so inside, parted to 1/3–2/5, prominently 5-veined; lobes slightly recurved, triangular to lanceolate, apex acute. Corolla pink to deep wine purple; tube 8–11 mm; limb 6–13 (–18) mm wide; lobes suborbicular to obovate-oblong, 4–5 mm, margin entire or obscurely emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style 1–2 mm. Capsule cylindrical, ca. as long as calyx. Fl. Jul–Sep. $2n = 22^*$.

Grassy mountain slopes, streamsides; 3900–5300 m. S Xizang [Bhutan, Sikkim].

150. *Primula ioessa* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 216. 1937.

缺叶钟报春 que ye zhong bao chun

Primula sikkimensis J. D. Hooker subsp. *subpinnatifida* W.W. Smith; *P. sikkimensis* var. *subpinnatifida* (W.W. Smith) W.W. Smith.

Herbs perennial. Leaves in a rosette; petiole usually much shorter than or sometimes nearly as long as leaf blade; leaf blade narrowly oblong to oblanceolate, 6–20 × 1–2.5 cm, base attenuate, margin serrate-dentate to incised-dentate, apex rounded to acute. Scapes 10–30 cm, scarcely farinose toward apex; umbels 2–8-flowered; bracts linear to linear-lanceolate, 0.5–1.5 cm, sparsely yellow farinose, purplish striate. Flowers heterostylous. Pedicel 1–6 cm, yellow farinose. Calyx campanulate to tubular-campanulate, 7–8 mm, scarcely farinose and stained with purple outside, copiously farinose inside, parted to middle, 5-veined; lobes triangular, apex often slightly recurved, acute. Corolla pink to violet, rarely white; tube 0.9–1.1 cm; limb 2–2.5 cm wide; lobes broadly obovate, emarginate to subentire. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, ca. as long as calyx. Fl. Jul. $2n = 22^*$.

* Alpine meadows; 3000–4200 m. SE Xizang.

151. *Primula lungchiensis* Fang, Acta Univ. Szechuan. 1: 88. 1956.

龙池报春 long chi bao chun

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole narrowly winged, nearly as long as leaf blade; leaf blade oblanceolate to spatulate, 2–5 × 0.6–1.5 cm, tapered to base, glabrous, sparsely minutely brown glandular, pinnately lobed nearly to midvein, apex rounded to obtuse; lobes lobulate to incised-dentate. Scapes 8–15 cm, glandular toward apex; umbels 4–7-flowered; bracts lanceolate to linear-lanceolate, 4–6 mm. Flowers heterostylous. Pedicel 2–5 mm, glandular. Calyx campanulate, 8–10 mm, parted slightly below middle; lobes lanceolate, copiously white farinose inside and on margin, apex acute. Corolla rose to purple; tube 1.1–1.5

cm; limb ca. 2 cm wide; lobes oblong, 9–10 × 4.5–5 mm, margin entire or with 2–4 teeth, apex rounded. Thrum flowers with stamens at middle of corolla tube; style ca. 3 mm. Capsule ellipsoid-cylindric, slightly longer than calyx. Fl. Jun.

* Grassy mountain slopes; ca. 1500 m. W Sichuan (Lixian Xian).

152. *Primula lactuoides* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 293. 1990.

囊谦报春 nang qian bao chun

Herbs perennial, without basal bud scales, with withered petioles at base. Leaves in a rosette; petiole usually 1/2–2/3 as long as leaf blade; leaf blade oblanceolate to oblong-oblanceolate, 2–4.5 × 0.9–1.5 cm, tapered to base, abaxially glabrous, adaxially puberulent, pinnately lobed 1/2 way to midvein, apex rounded; lobes narrowly triangular to sublinear, 2–4 mm, margin entire or with 1 or 2 teeth on each side. Scapes 10–15 cm, puberulent; umbels 3–7-flowered; bracts acuminate-subulate from ovate base, 4–9 mm, puberulent. Flowers heterostylous. Pedicel 0.6–2 cm, densely puberulent. Calyx tubular-campanulate, 8–9 mm, parted slightly below middle; lobes lanceolate, costate. Corolla white; tube 0.9–1.1 cm; limb ca. 1.5 cm wide; lobes obovate, 3.5–4 mm wide, apex rounded. Thrum flowers with stamens toward apex of corolla tube; style reaching middle of tube. Capsule ellipsoid-cylindric, longer than calyx. Fl. Jun.

* Wet rocks in *Picea* forests; ca. 4000 m. S Qinghai (Nang-qian Xian).

153. *Primula woonyoungiana* Fang, Acta Univ. Szechuan. 1: 102. 1956.

焕镛报春 huan yong bao chun

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole 4–12 cm, narrowly winged; leaf blade ovate, 3–5 × 2.5–3.5 cm, abaxially cream-yellow farinose, adaxially glabrous, base obtuse to subrounded, margin denticulate to crenulate, apex obtuse to acute. Scapes to 30 cm, scarcely farinose toward apex; umbels usually 2, superimposed, 4–8-flowered; bracts linear-lanceolate, 6–8 mm. Flowers heterostylous. Pedicel 1–3 mm, ± farinose. Calyx tubular-campanulate, 8–9 mm, parted to 2/3; lobes lanceolate, yellow farinose inside and along margin. Corolla bluish purple; tube ca. 1.3 cm; limb ca. 2 cm wide; lobes broadly obovate to suborbicular, 7–8 × ca. 7.5 mm, margin entire. Pin flowers: stamens ca. 5 mm above base of corolla tube; style ca. 7 mm, slightly longer than calyx. Capsule cylindrical, longer than calyx. Fl. Jun.

* W Sichuan (Maowen Xian).

154. *Primula diantha* Bureau & Franchet, J. Bot. (Morot) 5: 97. 1891.

双花报春 shuang hua bao chun

Primula amabilis I. B. Balfour & Forrest; *P. brevicula* I. B. Balfour & Forrest; *P. calliantha* Franchet subsp. *kiuchiangensis* (I. B. Balfour & Forrest) W. W. Smith & Forrest; *P. glacialis* Franchet; *P. kiuchiangensis* I. B. Balfour

& Forrest; *P. leucops* W.W. Smith & Kingdon-Ward; *P. leucops* var. *anopa* Handel-Mazzetti; *P. rigida* I. B. Balfour & Forrest.

Herbs perennial, without basal bud scales and long overlapping stocks, with remains of old leaves at base. Leaves in a rosette; petiole inconspicuous or nearly as long as leaf blade, narrowly winged and suddenly dilated to a triangular base; leaf blade oblong-spatulate to lanceolate in outer leaves or narrowly oblanceolate to linear-oblanceolate in inner leaves, 1–5 cm × 5–10(–18) mm, abaxially white or cream-yellow farinose, base attenuate, margin denticulate to crenulate, often revolute, apex obtuse to rounded. Scapes (1–)2–8(–12) cm, glandular to scarcely farinose toward apex; umbels 2–6(–10)-flowered; bracts often purplish, lanceolate to subulate. Flowers heterostylous. Pedicel 3–10 mm, often shorter than bracts at anthesis. Calyx tubular, 6–10 mm, purplish outside, farinose inside, parted to middle or below; lobes lanceolate to narrowly oblong, apex acute to subobtuse. Corolla bluish purple; tube 1–1.4(–1.6) cm; limb 1.5–2 cm wide; lobes elliptic to obovate-oblong, margin entire to obscurely crenate, apex rounded. Pin flowers: stamens 2.5–3.5 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers with positions reciprocal. Capsule cylindrical, longer than calyx. Fl. Jun.

* Stony meadows, talus slopes in alpine zone; 4000–4800 m. W Sichuan, E Xizang, NW Yunnan.

155. *Primula minor* I. B. Balfour & Kingdon-Ward in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 29. 1915.

雪山小报春 xue shan xiao bao chun

Primula atuntuensis I. B. Balfour & Forrest; *P. helvenacea* I. B. Balfour & Kingdon-Ward; *P. petraea* I. B. Balfour & Forrest.

Herbs perennial, without basal bud scales, petioles not overlapping. Leaves in a rosette; petiole 1–3 × as long as leaf blade, narrowly winged and dilated to a triangular base; leaf blade spatulate to oblong-spatulate or oblanceolate, 1.5–3 cm × 5–10 mm, abaxially cream-yellow farinose, base cuneate-attenuate, margin ± regularly blunt denticulate, apex rounded, rarely acute. Scapes 3.5–7(–17) cm, ± farinose toward apex; umbels 3–8-flowered; bracts linear-subulate, 5–7(–12) mm, scarcely farinose. Flowers heterostylous. Pedicel 3–15(–30) mm, elongated to 4 cm in fruit, densely farinose. Calyx tubular, farinose inside, parted to middle or below; lobes narrowly oblong, apex acute to obtuse. Corolla lavender-rose or violet, rarely white; limb ca. 2 cm wide; lobes elliptic to obovate, margin entire, rarely crenulate. Pin flowers: calyx 6–10 mm; corolla tube 1.2–1.6 cm; stamens ca. 5 mm above base of corolla tube; style 0.9–1.1 cm. Thrum flowers: calyx 5–7 mm; corolla tube 1.4–1.8 cm; stamens 1–1.1 cm above base of corolla tube; style 3–4.5 mm. Capsule cylindrical, 1–1.5(–2) cm. Fl. Jun.

* Stony meadows, cliffs, *Rhododendron* thickets; 4300–5000 m. SE Xizang, NW Yunnan.

156. *Primula optata* Farrer ex I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 187. 1916.

心愿报春 xin yuan bao chun

Primula longipetiolata Pax & K. Hoffmann.

Herbs perennial, with few bud scales at base, petioles and basal bud scales not overlapping. Leaves in a rosette; petiole 1/5–1/2 to rarely nearly as long as leaf blade; leaf blade oblanceolate to oblong-spatulate, 3–7(–10) × 1–2.5(–3.5) cm, efarinose or abaxially white farinose when young, base attenuate, margin ± regularly denticulate, apex rounded. Scapes 3–5 cm, elongated to 16 cm; umbels 1 or 2, superimposed, 4–8(–10)-flowered; bracts subulate from a wide base, 5–8 mm. Flowers heterostylous. Pedicel 2–13 mm, ± farinose. Calyx tubular-campanulate, (0.7–)0.9–1.1 cm, sparsely glandular outside, usually farinose inside, parted to or slightly below middle; lobes oblong-lanceolate, apex obtuse to acute. Corolla bluish purple; limb 1.5–2 cm wide; lobes elliptic to oblong, 8–10 × 4–5 mm, margin entire. Pin flowers: corolla tube 1–1.3 cm; stamens 3–4 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube 1.3–1.5 cm; stamens at upper part of corolla tube; style ca. 4 mm. Capsule cylindrical, 1.5–2 cm. Fl. May–Jun.

* Moist meadows, among rocks, forest margins; 3200–4500 m. S Gansu, E Qinghai, W Sichuan.

157. *Primula limbata* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 13. 1920.

匙叶雪山报春 chi ye xue shan bao chun

Primula sinonivalis I. B. Balfour & Forrest.

Herbs perennial, without basal bud scales at anthesis, with old withered leaves at base. Leaves in a rosette; petiole obscure to 1/2 as long as leaf blade, broadly winged; leaf blade narrowly oblanceolate to oblong-elliptic, 5–12 × 2–3.5 cm, efarinose or abaxially white farinose along margin when young, base cuneate-attenuate, margin ± regularly blunt denticulate, apex rounded to acute. Scapes 10–20 cm, scarcely white farinose toward apex; umbels 1 or 2, 4–8-flowered; bracts linear, 8–10 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm. Calyx tubular, 0.8–1.2 cm, puberulent outside, densely white farinose inside, parted to below middle; lobes lanceolate, apex acute. Corolla bluish purple; limb ca. 2 cm wide; lobes elliptic to obovate, margin entire. Pin flowers: corolla tube 1–1.1 cm; stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: corolla tube ca. 1.5 cm; stamens toward apex of corolla tube; style reaching middle of tube. Capsule cylindrical, 1.5–2 × as long as calyx. Fl. Jun–Jul.

* Stony grassy slopes, wet meadows, streamsides; 3700–4300 m. SE Xizang, NW Yunnan.

158. *Primula hoi* Fang, Acta Univ. Szechuan. 1: 100. 1956.

单伞长柄报春 dan san chang bing bao chun

Herbs perennial, without basal bud scales and overlapping petioles. Leaves in a rosette; petiole narrowly winged, nearly as long as leaf blade; leaf blade elliptic to oblong-elliptic, 5–10 × 2.5–4.5 cm, submembranous when dry, abaxially white farinose when young, becoming

efarinose, base short attenuate, margin regularly denticulate, apex obtuse to acute. Scapes 14–28 cm, scarcely farinose toward apex; umbels 2–8-flowered; bracts linear-lanceolate, 4–7 mm. Flowers heterostylous. Pedicel 0.5–2(–3) cm, sparsely glandular, white farinose toward apex. Calyx tubular-campanulate, 7–10(–12) mm, glandular outside, densely white farinose inside, parted slightly below middle; lobes oblong-lanceolate, apex acute. Corolla pale bluish purple; tube 1.1–1.4 cm; limb ca. 2 cm wide; lobes broadly obovate, 8–9 × ca. 7 mm, margin entire. Pin flowers: stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: stamens toward apex of corolla tube; style slightly shorter than calyx. Capsule unknown. Fl. Jun.

* Grassy mountain slopes, woodland margins. W Sichuan (Lixian Xian).

159. *Primula nivalis* Pallas, Reise Russ. Reich. 3: 723. 1776.

雪山报春 xue shan bao chun

Herbs perennial, with long stocks formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, usually slightly shorter than leaf blade; leaf blade elliptic to oblong-ovate or oblong-lanceolate, 6–16 × 1–4 cm, glabrous, efarinose or farinose, base attenuate, margin ± regularly blunt denticulate, apex obtuse to acute. Scapes 10–25 cm, elongated to 35 cm in fruit; umbels 8–20-flowered; bracts narrowly lanceolate, 5–14 mm. Flowers heterostylous. Pedicel 0.7–1.5 cm, elongated to 1.6–3.5 cm in fruit. Calyx tubular, 6–11 mm, parted to ± middle; lobes lanceolate. Corolla violet to purple; tube 0.8–1.5 cm; limb 1.5–2.5 cm wide; lobes oblong, margin entire. Pin flowers: stamens 3–4 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers: stamens slightly above apex of calyx; style ca. 2 mm. Capsule oblong, 1–2 × as long as calyx. $2n = 22$.

Wet meadows, shaded areas in valley marshes; 2100–3000 m. NE and NW Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].

- 1a. Plants efarinose 159a. var. *nivalis*
- 1b. Leaves and pedicels ± white
farinose 159b. var. *farinosa*

159a. *Primula nivalis* var. *nivalis*

雪山报春(原变种) xue shan bao chun (yuan bian zhong)

Plants completely efarinose. Fl. Jun.

Wet meadows, shaded areas in valley marshes; 2100–3000 m. NE and NW Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan].

159b. *Primula nivalis* var. *farinosa* Schrenk, Enum. Pl. Nov. 1: 22. 1841.

准尔报春 zhun ge er bao chun

Primula nivalis var. *colorata* Regel; *P. nivalis* var. *longifolia* Regel; *P. nivalis* var. *turkestanica* Regel; *P. turkestanica* (Regel) E. A. White.

Leaves white farinose abaxially, sometimes only along margin. Pedicel white farinose. Fl. Jun.

Wet meadows. NW Xinjiang [Kazakhstan, Kyrgyzstan].

160. *Primula melanantha* (Franchet) C. M. Hu, *Novon* 4: 104. 1994.

深紫报春 shen zi bao chun

Primula nivalis Pallas var. *melanantha* Franchet, *J. Bot. (Morot)* 9: 449. 1895.

Herbs perennial. Rhizomes short, thick, densely covered with persistent overlapping ovate-lanceolate scales, scales 2–6 cm. Leaves in a rosette; petiole broadly winged, much longer than basal scales at anthesis; leaf blade oblanceolate, 5.5–12 × 1.5–3 cm, gradually narrowed to base, margin crenate-denticulate, sparsely or scarcely pubescent abaxially, densely pubescent adaxially; midvein broad, prominent abaxially; lateral veins slender, inconspicuous. Scapes 25–40 cm, puberulent, ± mealy near apex; umbels simple, many flowered; bracts 7–10 mm, basal bracts triangular, subulate-acuminate. Flowers heterostylous. Pedicel 1–3 cm. Calyx campanulate, 8–9 mm, parted to middle or above; lobes lanceolate, ciliolate, apex acute. Corolla dark purple; limb 1–1.3 cm in diam.; lobes oblong to oblong-elliptic, 6–9 × 2–4.5 mm, puberulent on both sides, apex obtuse to subacute. Pin flowers: corolla tube 8–9 mm; stamens inserted at basal 3 mm of corolla tube; style slightly exerted from corolla tube. Thrum flowers: corolla tube 1.1–1.2 cm; stamens inserted near apex of corolla tube; style reaching middle of corolla tube. Ovary globose. Capsule unknown. Fl. Jun.

* Grassy mountain slopes; ca. 3500 m. W Sichuan (Kangding Xian, Zheduo Shan).

Although originally described as a variety of *Primula nivalis* Pallas and later associated with *P. limbata* I. B. Balfour & Forrest and *P. russeola* I. B. Balfour & Forrest, *P. melanantha* is much closer to *P. purdomii* Craib on account of its habit. It differs from all of the above mentioned species by its pubescent leaves and much smaller flowers.

161. *Primula woodwardii* I. B. Balfour, *Notes Roy. Bot. Gard. Edinburgh* 9: 61. 1915.

岷山报春 min shan bao chun

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, usually slightly shorter than leaf blade, concealed by bud scales; leaf blade lanceolate to oblong-lanceolate or oblanceolate, 6–12 × 1–3 cm, initially puberulent, glabrescent, efarinose, base attenuate, margin finely crenate to subentire, apex acute to obtuse. Scapes 8–25 cm, minutely pubescent and glandular; umbels 3–15-flowered; bracts linear-lanceolate, 5–8 mm. Flowers heterostylous. Pedicel 0.5–2 cm, glandular puberulent. Calyx tubular-campanulate, 7–11 mm, parted slightly below middle; lobes lanceolate, apex acute to obtuse. Corolla deep violet to pale purple; tube darker than lobes; limb 2–3 cm wide; lobes lanceolate to narrowly oblong, usually ca. as long as tube. Pin

flowers: corolla tube ca. 1 cm; stamens ca. 4 mm above base of corolla tube; style ca. 6 mm. Thrum flowers: corolla tube 1.2–1.3 cm; stamens ca. 8 mm above base of corolla tube; style ca. 2.5 mm. Capsule cylindrical, 0.8–1.5 cm. Fl. Jun–Jul.

* Wet meadows; 2700–3700 m. S Gansu, E Qinghai, S Shaanxi (Taibai Shan).

162. *Primula purdomii* Craib, *Gard. Chron.*, S 關. 3, 53: 192. 1913.

紫罗兰报春 zi luo lan bao chun

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales, with fibrous remains of leaves at base. Leaves in a rosette; petiole usually shorter than leaf blade, concealed by basal bud scales; leaf blade lanceolate to oblong-lanceolate or oblanceolate, 3–12 × 1–2.5 cm, efarinose to scarcely white farinose, base attenuate, margin subentire to obscurely denticulate, apex acute to obtuse. Scapes 8–20 cm, white farinose toward apex; umbels 8–12(–18)-flowered; bracts linear-lanceolate to subulate, 5–13 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, elongated to 2–5 cm in fruit, white or cream-yellow farinose. Calyx tubular-campanulate, 6–10 mm, parted to middle; lobes oblong-lanceolate, glandular puberulent outside, usually farinose inside. Corolla bluish purple to pale purple or nearly white; limb 1.6–2 cm wide; lobes same color as or darker than tube, oblong, 9–10 × 4–6 mm, margin entire. Pin flowers: corolla tube 1.1–1.3 cm; stamens 3–4 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers: corolla tube 1.2–1.5 cm; stamens at middle of corolla tube; style reaching middle of calyx. Capsule cylindrical, ca. 2 × as long as calyx. Fl. Jun–Jul. $2n = 22^*$.

* Wet meadows, moist rock crevices, thickets; 3300–4100 m. S Gansu, SE Qinghai, NW Sichuan.

163. *Primula melanops* W. W. Smith & Kingdon-Ward, *Notes Roy. Bot. Gard. Edinburgh* 14: 48. 1923.

粉葶报春 fen ting bao chun

Primula leucochnoa Handel-Mazzetti.

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales, base with fibrous remains of leaves. Leaves in a rosette; petiole winged, portion exerted from basal bud scales indistinct, sometimes ca. 1/2 as long as leaf blade; leaf blade lanceolate to narrowly lanceolate, 7–15 × 1.2–3 cm, abaxially copiously white farinose, becoming nearly efarinose, base attenuate, margin entire to crenulate, usually narrowly revolute, apex acuminate. Scapes 25–35 cm, white farinose toward apex; umbels 1 or 2, superimposed; 5–12-flowered; bracts lanceolate to linear, 1–2.5 cm. Flowers heterostylous. Pedicel 1–4 cm, white farinose. Calyx tubular-campanulate, 0.9–1.2 cm, parted to middle or slightly below; lobes oblong to oblong-lanceolate, white farinose. Corolla deep bluish purple; tube 1.2–1.3 cm; limb ca. 2 cm wide; lobes elliptic-ovate, margin entire. Pin flowers: stamens ca. 3 mm above base of corolla tube; style nearly reaching mouth of corolla tube. Thrum flowers: stamens toward apex of corolla

tube; style slightly shorter than calyx. Capsule cylindrical, usually ca. 2 × as long as calyx. Fl. Jun–Jul. $2n = 22^*$.

* Wet meadows, rocky streamsides; 3900–5000 m. SW Sichuan.

164. *Primula graminifolia* Pax & K. Hoffmann, Repert. Spec. Nov. Regni Veg. 17: 97. 1920.

禾叶报春 he ye bao chun

Primula sinoplantaginea I. B. Balfour subsp. *graminifolia* (Pax & K. Hoffmann) W.W. Smith & Forrest; *P. sinoplantaginea* var. *graminifolia* (Pax & K. Hoffmann) W.W. Smith & H. R. Fletcher.

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole membranous winged, wider than leaf blade, mostly concealed by basal bud scales; leaf blade linear, 2.5–7 × 2–4(–6) mm, tapered to base, abaxially white farinose, margin subentire, narrowly revolute, apex blunt. Scapes 3–16 cm, white farinose toward apex; umbels 1 or 2, superimposed, 2–6-flowered; bracts linear-lanceolate, 5–14 mm. Flowers heterostylous. Pedicel 0.5–2 cm, sparsely white farinose. Calyx blackish purple, tubular-campanulate, 8–10(–12) mm, sparsely glandular puberulent outside, ± farinose inside, parted to 3/4; lobes lanceolate. Corolla purple; tube 1–1.2(–1.4) cm; limb ca. 2.5 cm; lobes oblong to ovate-elliptic, 1–1.3 cm × 5–8 mm, margin entire. Pin flowers: stamens 3–4 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers: stamens at middle of corolla tube; style ca. 2 mm. Capsule unknown. Fl. Jun–Jul.

* Grassy slopes; 4000–4800 m. NW Sichuan.

165. *Primula macrophylla* D. Don, Prodr. Fl. Nepal. 80. 1825.

大叶报春 da ye bao chun

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales, with fibrous remains of leaves at base. Leaves in a rosette; petiole broadly winged, portion exerted from basal bud scales very short to nearly as long as leaf blade; leaf blade lanceolate to oblanceolate, 4–25 × 0.5–4.5 cm, abaxially farinose, base cuneate-attenuate, margin entire to denticulate, usually narrowly revolute, apex acute to obtuse. Scape 10–25 cm, farinose toward apex; umbels 5- to many flowered; bracts lanceolate, 1–3.5 cm. Flowers heterostylous. Pedicel 1–3 cm, ± farinose. Calyx tubular, 0.8–1.5 cm, parted slightly below middle or to 3/4; lobes lanceolate to oblong, usually stained with purple outside, white farinose inside, apex acute to subobtuse. Corolla violet to purple; limb ca. 2 cm wide; lobes suborbicular to obovate, margin entire to emarginate. Pin flowers: corolla tube slightly longer than calyx; stamens ca. 4 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers: corolla tube ca. 1.5 × as long as calyx; stamens at upper 1/3 of corolla tube; style ca. 1/2 as long as calyx. Capsule cylindrical, 1–1.3 cm, ca. 2 × as long as calyx. $2n = 22$.

Grassy mountain slopes, rock crevices, wet meadows, marshes; 4000–5200 m. SW Xinjiang, Xizang [Afghanistan, Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

- 1a. Leaf blade 4–10 × 0.5–1.2 cm; scapes 2–8(–20) cm; bracts oblong-lanceolate, leaflike, longer than pedicel; corolla lobes obtusely 2-lobed 165c. var. *moorcroftiana*
- 1b. Leaf blade 10–25 × 1.5–4.5 mm; scapes 15–60 cm; bracts linear-lanceolate, usually shorter than pedicel; corolla lobes entire or only slightly notched.
 - 2a. Leaves abaxially white farinose; calyxlobes lanceolate 165a. var. *macrophylla*
 - 2b. Leaves and inflorescences yellow farinose; calyx lobes oblong 165b. var. *atra*

165a. *Primula macrophylla* var. *macrophylla*

大叶报春(原变种) da ye bao chun (yuan bian zhong)

Primula nivalis Pallas var. *macrophylla* (D. Don) Pax; *P. purpurea* Royle; *P. stuartii* Wallich var. *purpurea* (Royle) Watt.

Leaf blade 10–25 × 1.5–4.5 cm, abaxially white farinose or sometimes nearly efarinose. Scapes 15–60 cm; bracts linear-lanceolate, usually shorter than pedicel. Calyx lobes usually stained with purple outside, lanceolate, apex acute. Corolla lobes entire or only slightly notched. Fl. Jun–Jul.

Grassy mountain slopes, rock crevices; 4500–5200 m. N and W Xizang [Afghanistan, Bhutan, India, Kashmir, Nepal, Sikkim].

165b. *Primula macrophylla* var. *atra* W.W. Smith & H. R. Fletcher, Trans. Roy. Soc. Edinburgh 60(2): 289. 1942.

黄粉大叶报春 huang fen da ye bao chun

Leaf blade 10–25 × 1.5–4.5 cm, yellow farinose. Scapes 2–8(–20) cm, yellow farinose; bracts lanceolate, usually shorter than pedicel. Calyx lobes blackish purple, oblong, apex subobtuse. Corolla lobes entire. Fl. Jun–Jul.

* Wet meadows; 4500–5000 m. S and SE Xizang.

165c. *Primula macrophylla* var. *moorcroftiana* (Wallich ex Klatt) W. W. Smith & H. R. Fletcher, Trans. Roy. Soc. Edinburgh 60: 590. 1942.

长苞大叶报春 chang bao da ye bao chun

Primula moorcroftiana Wallich ex Klatt, J. Bot. 6: 120. 1868; *P. nivalis* Pallas var. *moorcroftiana* (Wallich ex Klatt) Pax; *P. stuartii* Wallich var. *moorcroftiana* (Wallich ex Klatt) Watt.

Leaf blade 4–10 cm × 5–12 mm, abaxially densely white farinose. Scapes 2–8(–20) cm; bracts broadly lanceolate to oblong-lanceolate, leaflike, usually longer than pedicel. Calyx lobes usually stained with purple outside, linear-lanceolate, apex acute. Corolla lobes obtusely 2-lobed. Fl. Jun–Jul.

Wet meadows, marshes; 4000–4700 m. SW Xinjiang, W Xizang [India, Kashmir, Nepal, Pakistan, Sikkim].

166. *Primula youngeriana* W.W. Smith in W. W. Smith & H. R. Fletcher, J. Linn. Soc., Bot. 52: 340. 1942.

展萼雪山报春 zhan e xue shan bao chun

Herbs perennial, with a short rootstock, base with few bud scales. Leaves in a rosette; petiole usually nearly as long as leaf blade; leaf blade elliptic to oblong-elliptic or oblanceolate, 10–14 × 2–6 cm, copiously fugacious white farinose, base cuneate-attenuate, margin ± regularly crenulate, apex rounded to obtuse. Scapes 20–25 cm; umbels 1(or 2), 2–6-flowered; bracts linear, 1–4 cm, apex acute. Pedicel 1–5 cm, elongated to 9 cm in fruit, ± farinose. Flowers heterostylous. Calyx green or blackish purple, 1–1.5(–2.5) cm, parted to near base; lobes spreading, lanceolate, copiously farinose inside. Corolla deep blue-violet; tube nearly as long as calyx; limb 2–3 cm wide; lobes oblong-elliptic to obovate, margin entire. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style reaching middle of tube. Capsule nearly as long as calyx. Fl. Jul–Aug.

* On mossy boulders; ca. 5000 m. E Xizang (Mainling Xian).

167. *Primula russeola* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 17. 1920.

黑萼报春 hei e bao chun

Primula ionantha Pax & K. Hoffmann; *P. lancifolia* Pax & K. Hoffmann.

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, initially indistinct, slightly longer than leaf blade at end of anthesis; leaf blade elliptic to oblong, sometimes lanceolate to oblanceolate, 5–15 × 1.5–5 cm, abaxially copiously fugacious cream-white farinose, base attenuate, margin finely denticulate and narrowly revolute, apex rounded to obtuse. Scapes (10–)15–30 cm, farinose toward apex; umbels (3–)5–12-flowered; bracts narrowly lanceolate, 1.3–2 cm. Flowers heterostylous. Pedicel initially often shorter than bracts, elongated to 4 cm in fruit, white farinose. Calyx usually blackish purple, tubular-campanulate, 0.9–1.3 cm, copiously white farinose inside and on margin, parted to 2/3 or below; lobes not spreading, oblong-lanceolate, apex obtuse to acute. Corolla deep purplish rose to deep indigo-purple; limb 2–3 cm wide; lobes obovate to suborbicular, margin entire. Pin flowers: corolla tube 1.1–1.3 cm; stamens ca. 5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube 1.3–1.5 cm; stamens toward apex of corolla tube; style 4–5 mm. Capsule cylindrical, nearly as long as calyx. Fl. Aug. $2n = 22^*$.

* Wet meadows, rocky streamsides; 3800–4100 m. SW Sichuan, SE Xizang, NW Yunnan.

168. *Primula ninguida* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 77. 1926.

林芝报春 lin zhi bao chun

Primula macrophylla D. Don var. *ninguida* (W.W. Smith) W.W. Smith & H. R. Fletcher.

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, nearly as long as to slightly longer than leaf blade; leaf blade lanceolate to oblanceolate, 3.5–9 × 1–1.5 cm, abaxially cream-yellow farinose, adaxially ± puberulent, base attenuate, margin crenulate, apex acute. Scapes ca. 15 cm, scarcely farinose toward apex; umbels 3–15-flowered; bracts narrowly lanceolate, ca. 1 cm. Pedicel 5–10 mm, cream-white farinose. Flowers heterostylous. Calyx tubular, 8–10 mm, parted nearly to base; lobes linear-lanceolate, ca. 1 mm wide, sparsely puberulent outside, copiously white farinose inside. Corolla deep purple-rose; limb 1.5–2 cm wide; lobes oblong-elliptic, 0.8–1.2 cm × 3–5 mm, margin entire. Pin flowers: corolla tube 1.3–1.4 cm; stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube 1.4–1.5 (–1.8) cm; stamens toward apex of corolla tube; style reaching middle of tube. Capsule cylindrical, longer than calyx. Fl. Jun.

* Moist meadows, streamsides, margins of woodlands and thickets; 3900–5000 m. SE Xizang (Mainling Xian, Nyingchi Xian).

169. *Primula chionantha* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 11. 1915.

紫花雪山报春 zi hua xue shan bao chun

Primula ingens W.W. Smith & Forrest; *P. sinopurpurea* I. B. Balfour ex Hutchinson.

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, portion exerted from basal bud scales very short to 1/2 as long as leaf blade at fruiting; leaf blade oblong-ovate to lanceolate, 5–20(–25) × 1–5 cm, abaxially densely bright yellow farinose, often fugacious on older leaves, base attenuate, margin denticulate to subentire, apex acute to obtuse. Scapes (15–)20–50(–70) cm, yellow farinose toward apex; umbels 1–4, superimposed, 3- to many flowered; bracts lanceolate to subulate, 0.5–1.5 cm. Flowers heterostylous. Pedicel 1–2.5 cm, elongated to 6 cm in fruit, densely bright yellow farinose. Calyx tubular-campanulate, 8–10(–12) mm, parted slightly below middle; lobes oblong-lanceolate, sparsely farinose outside, densely so inside. Corolla purplish violet, rarely white; tube 1.1–1.3 cm; limb 2–3 cm wide; lobes broadly elliptic to subobovate, margin entire. Pin flowers: stamens 4–5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 3 mm. Capsule cylindrical, ca. 2 × as long as calyx. Fl. May–Jul. $2n = 22^*$, $22 + 2 - 7f^*$, 44^* , $44 + 6 - 12f^*$.

* Wet meadows, woodland margins, among *Rhododendron*; 3000–4400 m. SW Sichuan, E Xizang, N and NW Yunnan.

170. *Primula sinoplantaginea* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 20. 1920.

车前叶报春 che qian ye bao chun

Herbs perennial, with a long stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, usually nearly as long as leaf blade; leaf blade lanceolate, (3–)4–10 × 0.6–1.5 cm, rarely linear and only 3–4 mm wide, sparsely pale yellow farinose or sometimes efarinose, base attenuate, margin entire to

obscurely denticulate, usually narrowly revolute, apex acute. Scape (5–) 10–20 cm, farinose toward apex; umbels 1(or 2), (2–)5–12-flowered; bracts linear-lanceolate, 0.7–1.5 cm. Flowers heterostylous. Pedicel 1–2 cm, elongated to 4 cm in fruit, pale yellow farinose. Calyx tubular-campanulate, 8–11 mm, usually blackish outside, densely farinose inside, parted slightly below middle; lobes narrowly oblong to lanceolate, apex subacute. Corolla deep purple or violet; tube 1.1–1.3 cm; limb 1.5–2 cm wide; lobes oblong-elliptic, margin entire. Pin flowers: stamens ca. 4 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers: stamens at upper 1/3 of corolla tube; style reach middle of tube. Capsule cylindrical, 1–2 × as long as calyx. Fl. May–Jul. $2n = 22^*$.

* Wet meadows, woodland margins; 3600–4500 m. W Sichuan, NW Yunnan.

171. *Primula farreriana* I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 167. 1916.

大通报春 da tong bao chun

Herbs perennial, with a stock 3–6 cm formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole winged, nearly as long as leaf blade; leaf blade elliptic to oblong-elliptic, (3–)6–10 × 2–4 cm, abaxially fugacious, white farinose, base short attenuate, margin denticulate, apex obtuse to subacuminate. Scapes 16–24 cm, farinose toward apex; umbels 3–7-flowered; bracts linear, 1–1.5 cm, usually farinose, slightly longer than pedicel. Flowers heterostylous. Pedicel 5–10 mm, copiously farinose. Calyx ± tinged with purple, tubular-campanulate, 1–1.1 cm, scarcely farinose outside, more densely so inside, parted to 2/3; lobes lanceolate to oblong-lanceolate, apex acute. Corolla pale lavender-blue; tube darker in color, ca. 1.3 cm; limb 2–2.5 cm wide; lobes broadly obovate 9–10 × 8–9 mm, emarginate. Pin flowers: stamens ca. 5.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens ca. 1.1 cm above base of corolla tube; style slightly exceeding middle of tube. Capsule cylindrical, ca. 2 × as long as calyx. Fl. Jun–Jul.

* Shaded rock crevices; 4000–5000 m. E Qinghai (Datong Xian).

172. *Primula megalocarpa* H. Hara, J. Jap. Bot. 49: 133. 1974.

大果报春 da guo bao chun

Primula macrophylla D. Don var. *macrocarpa* (Watt) W. W. Smith & H. R. Fletcher; *P. nivalis* var. *macrocarpa* (Watt) Pax; *P. stuartii* Wallich var. *macrocarpa* Watt.

Herbs perennial, with a stock formed by overlapping petioles and basal bud scales to 4 cm. Petiole broadly winged, usually shorter than leaf blade; leaf blade lanceolate to linear-lanceolate, 5–18 × 0.5–2 cm, abaxially pale yellow farinose, base attenuate, margin finely denticulate, narrowly revolute, apex acute to subobtuse. Scapes 3–12 cm, farinose toward apex; umbels 1–8-flowered; bracts linear-lanceolate, 0.7–2.2 cm, apex obtuse. Flowers heterostylous. Pedicel 0.6–1.8 cm, elongated to 4.5 cm in fruit, farinose. Calyx purplish brown outside, copiously yellow farinose inside, tubular-campanulate, 0.9–1.2 cm, parted to near base; lobes oblong-

oblanceolate, apex rounded. Corolla rose to purplish rose, rarely white; tube nearly as long as to slightly longer than calyx; limb 1.8–2 cm wide; lobes obovate, 0.8–1.2 × 0.6–1.4 cm, emarginate. Pin flowers: stamens ca. 4.5 mm above base of corolla tube; style slightly exceeding middle of tube. Capsule cylindrical, (1.5–) 1.8–3 cm. Fl. Jun–Jul.

Meadows, gullies; 4000–4600 m. S Xizang [Bhutan, Nepal].

173. *Primula calliantha* Franchet, Bull. Soc. Bot. France 32: 268. 1885.

美花报春 mei hua bao chun

Herbs perennial, with a bulblike stock formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole initially inconspicuous, nearly as long as leaf blade at fruiting; leaf blade narrowly ovate to obovate-oblong or oblanceolate, 3–9 × 1.2–3 cm at anthesis, enlarged to 18 cm at fruiting, abaxially copiously greenish yellow farinose, base cuneate-attenuate, margin crenulate, apex rounded to obtuse. Scapes 10–30 cm, elongated to 60 cm in fruit, pale yellow farinose on distal part; umbels 3–10-flowered; bracts lanceolate to subulate, 5–12 mm. Flowers heterostylous. Pedicel slightly shorter than bracts at beginning of anthesis, elongated to 2–3 × as long as bracts in fruit, copiously farinose. Calyx tubular-campanulate, 6–13(–15) mm, densely yellow farinose inside, parted to middle or below; lobes narrowly oblong, apex obtuse to acute. Corolla purple, rose, or yellow, rarely white; limb 2–3 cm wide; lobes broadly obovate, emarginate. Capsule cylindrical, slightly longer than calyx.

Pastures, meadows among *Rhododendron*, rocks of steep humus-clad slopes; 3700–4500 m. SE Xixang, Yunnan [NE India (Assam), N Myanmar].

- 1a. Corolla yellow 173c. subsp. *mishmiensis*
- 1b. Corolla purple, rose, or white.
 - 2a. Corolla tube less than 1.5 × as long as calyx 173a. subsp. *calliantha*
 - 2b. Corolla tube ca. 2 × as long as calyx 173b. subsp. *bryophila*

173a. *Primula calliantha* subsp. *calliantha*

美花报春(原亚种) mei hua bao chun (yuan ya zhong)

Leaf blade usually obovate at anthesis. Calyx 1–1.3(–1.5) cm. Pin flowers: corolla tube ca. 1.3 cm, gradually dilated upward; stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube cylindrical, ca. 1.4 cm, expanded near insertion of stamens; stamens toward tube apex; style ca. 3 mm. Fl. Apr–Jun, fr. Jul–Aug.

* Pastures; ca. 4000 m. W Yunnan.

173b. *Primula calliantha* subsp. *bryophila* (I. B. Balfour & Farrer) W. W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 31. 1928.

黛粉美花报春 dai fen mei hua bao chun

Primula bryophila I. B. Balfour & Farrer in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 5. 1920; *P. calliantha* var. *albiflos* W. W. Smith & Forrest; *P. calliantha* var. *nuda*

Farrer ex W.W. Smith; *P. junior* I. B. Balfour & Forrest; *P. proba* I. B. Balfour & Forrest; *P. shweli-calliantha* I. B. Balfour & Forrest; *P. tribola* I. B. Balfour & Forrest.

Leaf blade usually oblanceolate at anthesis. Calyx 6–8 (–9) mm. Pin flowers: corolla tube 1.3–1.4 cm; stamens slightly below middle of tube; style reaching annulus. Thrum flowers: tube 1.5–1.7 cm; stamens slightly below tube mouth; style ca. as long as calyx. Fl. Apr–Jun.

Meadows, among *Rhododendron*; 3800–4500 m. NW Yunnan [N Myanmar].

173c. *Primula calliantha* subsp. *mishmiensis* (Kingdon-Ward) C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 164. 1990.

黄美花报春 huang mei hua bao chun

Primula mishmiensis Kingdon-Ward, Ann. Bot. (Oxford) 44: 122, 125. 1930.

Leaf blade narrowly ovate to oblanceolate. Calyx ca. 1 cm. Corolla yellow; tube 1.2–1.5 cm; limb ca. 2.5 cm wide. Pin flowers: stamens below middle of corolla tube; style slightly shorter than tube. Thrum flowers: stamens toward apex of tube; style ca. 3 mm.

Rocks of steep humus-clad slopes, among *Rhododendron*; 3700–4000 m. SE Xizang [NE India (Assam)].

174. *Primula cerina* H. R. Fletcher, Trans. Bot. Soc. Edinburgh 33: 111. 1941.

蜡黄报春 la huang bao chun

Herbs perennial, with short rhizomes and withered leaves at base. Leaves in a rosette; petiole narrowly winged, nearly as long as leaf blade, not enveloped at base; leaf blade oblanceolate to spatulate, 2–2.5 cm × 5–10 mm, glandular puberulent, base attenuate, margin denticulate, apex rounded. Scapes 7–10 cm, glandular; umbels 2–6-flowered; bracts linear-lanceolate to subulate, to 5 mm. Flowers heterostylous. Pedicel 3–7 mm, glandular. Calyx tubular, 7–9 mm, glandular puberulent, parted slightly below middle; lobes narrowly ovate to lanceolate. Corolla yellow; tube 1.1–1.2 cm; limb ca. 1.5 cm wide; lobes elliptic to suborbicular, margin entire. Pin flowers: stamens ca. 4 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers: stamens slightly above middle of corolla tube; style ca. 1/3 as long as tube. Capsule cylindrical, ca. as long as to slightly longer than calyx. Fl. Jun–Jul.

* Grassy banks; ca. 4400 m. W Sichuan (S Kangding Xian).

175. *Primula crocifolia* Pax & K. Hoffmann, Repert. Spec. Nov. Regni Veg. 17: 96. 1920.

番红报春 fan hong bao chun

Herbs perennial, with stock to 3.5 cm formed by overlapping petioles and basal bud scales, with fibrous remains of leaves at base. Leaves in a rosette; petiole nearly enveloped by basal bud scales; leaf blade linear-lanceolate, 1.5–8 cm × 2–3.5 mm, tapered at base, abaxially scarcely white farinose (obscure when dry), margin entire to remotely obscure denticulate, narrowly revolute, apex acute. Scapes 2–8 cm, scarcely farinose, umbels 1–4-flowered; bracts lanceolate, 5–8 mm.

Flowers heterostylous. Pedicel 2–10 mm, ± farinose. Calyx tubular-campanulate, 5–8 mm, parted usually to 2/3; lobes often tinged with purple, oblong-lanceolate. Corolla yellow; tube 9–10 mm; limb 1–1.2 cm wide; lobes oblong, ca. 6 × 2 mm, margin entire. Thrum flowers: stamens at middle of corolla tube; style ca. 1/2 as long as calyx. Capsule cylindrical, ca. 2 × as long as calyx. Fl. May.

* Meadows, screes; 4300–4800 m. W Sichuan (Dawu Xian).

176. *Primula elongata* Watt, J. Linn. Soc., Bot. 20: 8. 1882.

黄齿雪山报春 huang chi xue shan bao chun

Herbs perennial; rootstock short, base with few bud scales. Leaves in a rosette; petiole initially very short, nearly as long as leaf blade at fruiting; leaf blade obovate to oblanceolate, 5–12 × 2–4 cm, enlarged to 15 × 5.5 cm at fruiting, abaxially pale yellow farinose when young, soon efarinose, base attenuate, rounded to cordate, margin denticulate, apex rounded to obtuse. Scape 5–30 cm, sometimes to 40 cm, yellow farinose toward apex; umbels 1 or 2, superimposed, 5–10-flowered; bracts linear, 5–8 mm, densely glandular. Flowers heterostylous. Pedicel nearly as long as bracts, elongated to 4.5 cm in fruit. Calyx tubular-campanulate, 6–9 mm, minutely glandular, parted to middle or below; lobes lanceolate to sublinear, apex obtuse to acute. Corolla yellow; limb ca. 1.5 cm wide; lobes obovate to suborbicular, with 4–6 teeth at apex. Pin flowers: corolla tube 1.3–1.5 cm; stamens at middle of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube 1.5–1.8 cm; stamens toward apex of corolla tube; style slightly exceeding middle of tube. Capsule cylindrical, 2–3 × as long as calyx. $2n = 18, 22$.

Woodland margins, wet meadows, *Rhododendron* scrub, coniferous forests; 3800–4300 m. S Xizang [Bhutan, NE India, Sikkim].

1a. All leaf bases attenuate 176a. var. *elongata*

1b. At least some leaf bases
cordate to rounded 176b. var. *barnardoana*

176a. *Primula elongata* var. *elongata*

黄齿雪山报春(原变种) huang chi xue shan bao chun (yuan bian zhong)

Leaf blade attenuate at base. Fl. May–Jun.

Woodland margins, wet meadows; 3800–4000 m. S Xizang (Chumbi Xian, Yadong Xian) [Bhutan, NE India].

176b. *Primula elongata* var. *barnardoana* (W.W. Smith & Kingdon-Ward) C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 166. 1990.

黄花圆叶报春 huang hua yuan ye bao chun

Primula barnardoana W.W. Smith & Kingdon-Ward in W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 167. 1936.

Leaf blade cordate to rounded at base, rarely slightly decurrent. Fl. May–Jun.

Rhododendron scrub, coniferous forests; 4000–4300 m. S Xizang (Mangu Xian) [Bhutan].

177. *Primula orbicularis* Hemsley, Gard. Chron., S開. 3, 39: 290. 1906.

圆瓣黄花报春 yuan ban huang hua bao chun

Primula ochracea Pax & K. Hoffmann.

Herbs perennial; stock 2–8 cm, formed by overlapping petioles and basal bud scales. Leaves in rosette; petiole broadly winged, nearly as long as leaf blade; leaf blade elliptic in outer leaves, oblong-lanceolate or lanceolate in inner leaves, (3–)5–15 × (1–)1.5–3 cm, tapered to base, abaxially cream-white farinose, becoming efarinose, margin subentire to finely denticulate, usually narrowly revolute, apex obtuse to acute. Scapes 10–30(–50) cm, cream-yellow farinose near apex when young; umbels 1(–3), superimposed, 4- to many flowered; bracts lanceolate to subulate, 0.5–1.8 cm, base cuneate. Flowers heterostylous. Pedicel 0.5–2 cm, elongated to 7.5 cm in fruit, pale yellow farinose. Calyx campanulate, 7–12 mm, glandular outside, densely farinose inside, parted to middle; lobes oblong-lanceolate. Corolla bright yellow to pale yellow, rarely white; tube 1.2–1.4 cm; limb 1.8–2.5 cm wide; lobes suborbicular to oblong, margin entire. Pin flowers: stamens ca. 4.5 mm above base of corolla tube; style ca. 2/3 as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, nearly as long as to 1.5 × as long as calyx. Fl. Jun–Jul.

* Damp meadows, woodland margins; 3100–4500 m. S Gansu, E Qinghai, W Sichuan.

178. *Primula reflexa* Petitmengin, Bull. Herb. Boissier, S開. 2, 8: 367. 1908.

嫩黄报春 nen huang bao chun

Herbs perennial, efarinose, without basal bud scales and long overlapping stocks. Leaves forming a rosette; petiole 2–6 cm; leaf blade oblanceolate, 6–14 × 2–3 cm, tapered to base, submembranous when dry, glabrous, margin regularly denticulate, apex subrounded. Scapes 34–40 cm, sparsely puberulent near apex; umbels 2, superimposed, 2–5-flowered; bracts lanceolate, 4–7 mm. Flowers heterostylous. Pedicel 0.8–1.5 cm, puberulent. Calyx narrowly campanulate, 0.8–1.2 cm, parted to middle; lobes oblong, glabrous, apex acute. Corolla pale yellow; tube 1.3–1.4 cm; limb 2.2–2.5 cm wide; lobes broadly elliptic to subrounded, 9–8 mm, apex rounded. Pin flowers: stamens at middle of corolla tube; style nearly as long as tube. Capsule unknown. Fl. Jun.

* W Sichuan (Batang Xian).

179. *Primula soongii* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 293. 1990.

滋圃报春 zi pu bao chun

Herbs perennial, efarinose, without basal bud scales. Leaves in a rosette; petiole broadly winged, not enveloped at base, nearly as long as to slightly shorter than leaf blade; leaf blade oblong to oblanceolate, 10–25(–30) × 2–4 cm, glabrous, minutely brownish punctate, base attenuate, margin erose-dentate, apex obtuse to acute. Scapes 20–38 cm; umbels 1, 6–14-flowered; bracts acuminate-subulate, 0.8–1.5 cm, base

cuneate. Flowers heterostylous. Pedicel 1.5–3 cm. Calyx tubular, 1.2–1.4 cm, brown punctate, parted to middle or slightly below; lobes oblong to lanceolate. Corolla pale yellow; limb 1.5–1.8 cm diam.; lobes oval to suborbicular, 7–9 × ca. 6 mm, often with reddish blotches, apex rounded. Pin flowers: corolla tube ca. as long as calyx; stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: corolla tube slightly longer than calyx; stamens toward apex of corolla tube; style reaching middle of tube. Capsule cylindrical, longer than calyx. Fl. Jun.

* Mixed forests, glades; 3200–4000 m. W Sichuan (Baoping Xian).

180. *Primula maximowiczii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3: 139. 1874.

胭脂花 yan zhi hua

Herbs perennial, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole broadly winged, usually inconspicuous, occasionally nearly as long as leaf blade; leaf blade obovate-elliptic to narrowly elliptic or oblanceolate, (3–)5–20(–27) × 1.5–3(–4) cm, tapered at base, margin denticulate, rarely subentire, apex obtuse to acute. Scapes 20–45(–70) cm; umbels 1–3, superimposed, 6–10(–20)-flowered; bracts lanceolate, 3–7 mm, connate at base. Flowers heterostylous. Pedicel 1–3(–4) cm. Calyx tubular-campanulate 6–10 mm, parted to 1/3; lobes triangular, glandular ciliate. Corolla intense crimson or pale yellow; limb ca. 1.5 cm wide; lobes strongly reflexed, narrowly oblong, 4–8 × 2.5–3 mm, margin entire. Pin flowers: corolla tube 1.1–1.3 cm; stamens 4–5 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube 1.4–1.9 cm; stamens slightly below annulus; style 3–4 mm. Capsule slightly longer than calyx. Fl. May–Jun. $2n = 22^*$.

Moist areas in woodlands; 1800–2900 m. Beijing Shi, Hebei, Jilin, Nei Mongol, Shaanxi, Shanxi [Mongolia].

- 1a. Corolla intense crimson 180a. var. *maximowiczii*
1b. Corolla pale yellow 180b. var. *flaviflorida*

180a. *Primula maximowiczii* var. *maximowiczii*

胭脂花(原变种) yan zhi hua (yuan bian zhong)

Primula maximowiczii var. *brevifolia* Pax; *P. maximowiczii* var. *dielsiana* Pax; *P. oreocharis* Hance.

Corolla intense crimson. Fl. May–Jun.

Moist areas in woodlands; 1800–2900 m. Hebei, Jilin, Nei Mongol, Shaanxi, Shanxi [Mongolia].

180b. *Primula maximowiczii* var. *flaviflorida* D. C. Lu, J. Beijing Forest. Coll. 14(3): 112. 1992.

黄胭脂花 huang yan zhi hua

Corolla pale yellow. Fl. May.

* Grassy slopes; ca. 1800 m. Beijing Shi (Baihua Shan).

181. *Primula advena* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 311. 1938.

折瓣雪山报春 zhe ban xue shan bao chun

Herbs perennial, base with bud scales and withered leaves. Leaves in a rosette; petiole broadly winged, usually slightly shorter than leaf blade; leaf blade oblanceolate to obovate, 6–15 × 2–5 cm, efarinose or farinose along margin abaxially, base attenuate, margin dentate to serrate-dentate, apex acute to obtuse. Scapes to 50 cm, scarcely farinose toward apex; umbels 1–3, superimposed, 5–12-flowered; bracts sublinear, 0.5–1.5 cm, margin usually farinose. Flowers heterostylous. Pedicel 1–3(–4) cm, efarinose or occasionally farinose. Calyx green or tinged with purple, tubular-campanulate, 1–1.1 cm, parted to middle; lobes lanceolate, apex acute. Corolla yellow or purple; tube 1.4–1.7 cm; lobes oblong, 7–10 × ca. 3 mm, strongly reflexed. Thrum flowers: stamens 1–1.1 cm above base of corolla tube; style ca. 3 mm. Capsule slightly longer than calyx.

* Rock crevices, thickets, damp meadows; 4000–4600 m. E Xizang.

- 1a. Corolla pale yellow or tube tinged with purple 181a. var. *advena*
1b. Corolla and tube dark purple 181b. var. *euprepes*

181a. *Primula advena* var. *advena*

折瓣雪山报春(原变种) zhe ban xue shan bao chun (yuan bian zhong)

Primula advena var. *argentata* W.W. Smith; *P. advena* var. *concolor* W.W. Smith.

Corolla pale yellow or tube tinged with purple. Fl. Jul–Aug.

* Rock crevices, thickets; 4100–4600 m. E Xizang.

181b. *Primula advena* var. *euprepes* (W.W. Smith) Chen & C. M. Hu, Fl. Xizang, 3: 799. 1986.

紫折瓣报春 zi zhe ban bao chun

Primula maximowiczii Regel var. *euprepes* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 79. 1926.

Corolla uniformly dark purple.

* Damp meadows; 4000–4300 m. E Xizang.

182. *Primula tangutica* Duthie, Gard. Chron., S開. 3, 38: 42. 1905.

甘青报春 gan qing bao chun

Herbs perennial, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade, rarely nearly as long as leaf blade; leaf blade elliptic to elliptic-oblanceolate or lanceolate, 4–15(–20) × 2–3 cm, tapered at base, minutely brown punctate, margin denticulate, rarely subentire, apex obtuse to acute. Scapes 20–60 cm; umbels 1–3, superimposed, 5–9-flowered; bracts linear-lanceolate, 6–10(–15) mm. Flowers heterostylous. Pedicel 1–4 cm, puberulent. Calyx tubular, 1–1.3 cm, parted 1/3–1/2; lobes triangular to lanceolate, ciliolate. Corolla intense crimson or yellow; lobes strongly reflexed, linear, 7–10 × 1–2 mm. Pin flowers: corolla tube ca. as long as calyx;

stamens ca. 2.5 mm above base of corolla tube; style ca. 6 mm. Thrum flowers: corolla tube ca. 1.5 × as long as calyx; stamens at level of calyx; style ca. 2 mm. Capsule 3–5 mm longer than calyx. $2n = 22^*$.

* Woodlands, streamsides, damp meadows, *Picea-Rhododendron* forests; 3300–4700 m. S Gansu, E Qinghai, Sichuan, E Xizang.

- 1a. Corolla deep crimson to blackish purple 182a. var. *tangutica*
1b. Corolla pale yellow or pink 182b. var. *flavescens*

182a. *Primula tangutica* var. *tangutica*

甘青报春(原变种) gan qing bao chun (yuan bian zhong)

Primula silenantha Pax & K. Hoffmann; *P. tangutica* var. *serrata* W.W. Smith & H. R. Fletcher.

Corolla deep crimson to blackish purple. Fl. Jun–Jul, fr. Aug.

* Woodlands, streamsides; 3300–4700 m. S Gansu, E Qinghai, NW Sichuan.

182b. *Primula tangutica* var. *flavescens* Chen & C. M. Hu, Acta Phytotax. Sin. 18: 384. 1980.

黄甘青报春 huang gan qing bao chun

Corolla pale yellow or pink. Fl. May–Jun.

* Damp meadows, *Picea-Rhododendron* forests; 3800–4400 m. W Sichuan, E Xizang.

183. *Primula szechuanica* Pax in Engler, Pflanzenr. IV. 237 (Heft 22): 106. 1905.

四川报春 si chuan bao chun

Primula declinis I. B. Balfour & Forrest; *P. decurva* I. B. Balfour & Forrest; *P. gagnepainiana* Handel-Mazzetti.

Herbs perennial, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole usually shorter to occasionally nearly as long as leaf blade; leaf blade elliptic to oblanceolate, 5–12 × 1.5–4(–6) cm, base attenuate, margin denticulate, apex acute to obtuse. Scapes 12–50(–75) cm; umbels 1 or 2(–4), superimposed, 4–15-flowered; bracts lanceolate, 5–10 mm. Flowers heterostylous. Calyx tubular-campanulate, 8–10 mm, parted to middle; lobes oblong-lanceolate. Corolla pale yellow; tube 1.4–1.5 cm; lobes reflexed, lying against tube, oblong, 6–8 × 3–4 mm. Pin flowers: stamens 6–7 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, to 2 cm. Fl. Jun. $2n = 22^*$.

* Damp meadows, woodland margins, among *Rhododendron*; 3300–4500 m. W Sichuan, NW Yunnan.

184. *Primula aemula* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 2. 1915.

粗葶报春 cu ting bao chun

Herbs perennial, glabrous, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole broadly winged,

indistinct to 1/2 as long as leaf blade; leaf blade obovate-elliptic to oblanceolate at base, 1–2.5 cm × 3.5–7 mm, base long attenuate, margin crenate-denticulate, apex subrounded to slightly pointed. Scapes 35–75 cm; umbels usually 2–4, superimposed, 4–8-flowered; bracts lanceolate, 0.8–1.5 cm, apex acuminate. Flowers heterostylous. Pedicel 1–3.5 cm. Calyx narrowly campanulate, 8.5–10 mm, parted to middle or below; lobes lanceolate, apex acute to subacuminate. Corolla pale yellow; tube 5–6 mm longer than calyx; limb 1.5–2(–3) cm wide; lobes ovate to ovate-oblong, 8–10 × 2–5 mm. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, nearly 2 × as long as calyx. Fl. Jul.

* Open mountain pastures, wet alpine meadows; 4000–4600 m. SW Sichuan, N Yunnan.

185. *Primula tzetsouensis* Petitmengin, Bull. Herb. Boissier, S. 2, 8: 366. 1908.

心叶黄花报春 xin ye huang hua bao chun

Primula yuana Chen.

Herbs perennial, efarinose, with few basal bud scales at anthesis. Leaves in a rosette; petiole 4–10 cm, narrowly winged; leaf blade ovate, 1.5–3.5 × 1–2.5 cm, base rounded to shallowly cordate, margin denticulate, apex acute. Scapes 16–29 cm; umbels 2–6-flowered; bracts linear-lanceolate, 5–7 mm. Flowers heterostylous. Pedicel 6–10 mm, elongated to 2 cm in fruit. Calyx tubular, 6–8 mm, parted to near middle; lobes lanceolate, apex acute. Corolla cream-yellow; tube 1.2–1.3 cm; lobes usually strongly reflexed, oblong, 5–7.5 × 3–4 mm. Pin flowers: stamens at middle of corolla tube; style nearly as long as tube. Thrum flowers with positions reciprocal. Capsule unknown. Fl. Jul.

* Shaded areas near rocks; ca. 4000 m. SW Sichuan (Jiulong Xian, Yajiang Xian).

186. *Primula handeliana* W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 45. 1928.

陕西报春 shaan xi bao chun

Herbs perennial, efarinose, without basal bud scales at anthesis. Leaves in a rosette; petiole narrowly winged, nearly as long as to longer than leaf blade; leaf blade oblong to elliptic or ovate, rarely lanceolate, 2.5–8 × 1–2.5(–3.5) cm, abaxially glaucous, adaxially dark green, base broadly cuneate, rarely subrounded, margin denticulate, apex acute to obtuse. Scapes 15–30 cm; umbels 1 or 2, superimposed, 3–15-flowered; bracts lanceolate, 5–9 mm. Flowers heterostylous. Pedicel 0.5–5 cm. Calyx tubular, 8–10 mm, parted to middle or slightly below; lobes lanceolate to oblong-lanceolate. Corolla yellow; limb 1.5–1.8 cm wide; lobes oblong, 7–9 × 3.5–4 mm, margin entire. Pin flowers: corolla tube 1.2–1.3 cm; stamens toward middle of tube; style reaching mouth of tube. Thrum flowers: corolla tube 1.4–1.8 cm; stamens toward apex of corolla tube; style ca. 4 mm. Capsule cylindrical, slightly longer than calyx. Fl. May–Jul.

* Open forests, damp rocks; 2500–3600 m. Shaanxi (Taibai Shan).

187. *Primula boreiocalliantha* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 5. 1920.

木里报春 mu li bao chun

Primula coryana I. B. Balfour & Forrest ex W.W. Smith; *P. muliensis* Handel-Mazzetti; *P. propinqua* I. B. Balfour & Forrest.

Herbs perennial; stock 2–5 cm, formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole broadly winged, initially concealed by bud scales, nearly as long as leaf blade at end of anthesis; leaf blade narrowly oblong-lanceolate, (4–)6–20 × 1.2–4.5 cm at anthesis, abaxially olive-colored farinose, base attenuate, margin ± regularly blunt dentate, apex acute. Scapes 15–35(–45) cm, elongated to 60 cm at anthesis, farinose toward apex; umbels 1 or 2(or 3), superimposed, 3–9-flowered; bracts lanceolate, 0.5–1.5 cm. Flowers heterostylous. Pedicel 1–3.5 cm, scarcely farinose. Calyx (0.8–)1–1.3 cm, parted slightly below middle; lobes oblong-lanceolate to lanceolate, usually farinose inside, apex subacute. Corolla rose-lavender or rose-purple, campanulate, exannulate; limb 2.5–3.5 cm wide; lobes obovate, emarginate to occasionally erose-denticulate. Pin flowers: corolla tube slightly longer than calyx; stamens in lower 1/2 of tube; style nearly reaching mouth. Thrum flowers: corolla tube 1.25–1.5 × as long as calyx; stamens slightly above calyx; style ca. 3 mm. Capsule cylindrical, ca. 2 × as long as calyx. Fl. May–Jun.

* Damp meadows, woodland margins, *Rhododendron* thickets; 3600–4000 m. SW Sichuan, NW Yunnan.

188. *Primula agleniana* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 3. 1920.

乳黄雪山报春 ru huang xue shan bao chun

Primula agleniana var. *alba* Forrest; *P. agleniana* var. *atrocrocea* Ward.

Herbs perennial; bulblike stock formed by overlapping basal bud scales. Petiole ca. as long as to slightly shorter than leaf blade, usually longer at fruiting; leaf blade lanceolate to oblanceolate, 10–25 × 2–5 cm, abaxially greenish yellow farinose or nearly efarinose, base attenuate, margin lacinate-dentate, apex acute. Scapes 20–40 cm, sparsely farinose toward apex; umbels 2–5(–8)-flowered; bracts lanceolate, 5–10 mm. Flowers heterostylous. Pedicel 1.5–3(–4) cm, elongated to 6 cm in fruit, densely minutely glandular. Calyx campanulate, 1.1–1.5 cm, glandular, parted to near middle; lobes oblong, apex obtuse to rounded. Corolla pale yellow or cream-white, rarely white or pink, campanulate, ca. 3 cm, exannulate; limb 3–4 cm wide; lobes broadly obovate to orbicular, ca. 1 × 1.2 cm, slightly emarginate. Pin flowers: corolla tube ca. as long as calyx; stamens at middle of tube; style ca. 1 cm. Thrum flowers: corolla tube slightly longer than calyx; stamens at level of calyx; style ca. 2 mm. Capsule cylindrical, ca. as long as to slightly longer than calyx. Fl. May–Jun.

Damp meadows, streamsides; 4000–4500 m. SE Xizang, NW Yunnan [N Myanmar].

189. *Primula obliqua* W.W. Smith, Trans. Bot. Soc. Edinburgh 26: 119. 1913.

斜花雪山报春 xie hua xue shan bao chun

Herbs perennial; stock 5–7 cm, formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole winged, usually slightly shorter than leaf blade; leaf blade lanceolate to oblanceolate or narrowly obovate, 8–20 × 1.5–4.5 cm, abaxially pale yellow farinose, base attenuate, margin regularly serrate to crenate, apex obtuse to acute. Scapes 20–55 cm, farinose on upper part; umbels 1, 5- or 6-flowered; bracts lanceolate to subulate, 6–10 mm. Flowers nodding, heterostylous. Pedicel 1–3(–5) cm, elongated to 5 cm in fruit, yellow farinose. Calyx tubular-campanulate, 8–10(–15) mm, yellow farinose, parted to middle or slightly below; lobes oblong, apex rounded to obtuse. Corolla pale yellow or white, campanulate, exannulate; tube 1.4–1.6 cm; limb 2–3 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near middle of corolla tube; style nearly reaching mouth. Thrum flowers with positions reciprocal. Capsule cylindrical, ca. as long as to slightly longer than calyx. Fl. Jun–Jul. $2n = 22$.

Wet meadows, woodlands; 3000–4100 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

190. *Primula falcifolia* Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 76. 1926.

镰叶雪山报春 lian ye xue shan bao chun

Herbs perennial; stock 2–5 cm long, bulblike, formed by overlapping petioles and basal bud scales. Petiole indistinct to 1/2 as long as leaf blade; leaf blade linear-lanceolate, 5–20 cm at anthesis, elongated to 30 cm at fruiting, 5–10 mm wide, base attenuate, margin serrate, apex acute. Scapes 10–20 cm; umbels 1- or 2(–4)-flowered; bracts lanceolate, 0.7–1.5 cm. Flowers heterostylous. Pedicel 1.5–2 cm, elongated to 5.5 cm in fruit. Calyx cupular, 5–8 mm, parted to middle; lobes subquadrangular, ca. 2.5 mm wide, apex rounded to truncate. Corolla yellow, exannulate; tube 1.2–1.3 cm; limb 2.5–3 cm wide; lobes depressed orbicular, ca. 1 cm wide, margin entire. Pin flowers: stamens ca. 4.5 mm above base of corolla tube; style ca. 8 mm. Thrum flowers with positions reciprocal. Capsule slightly longer than calyx.

* Damp meadows, *Abies* forests, alpine scrub; 3300–4300 m. E Xizang.

1a. Plants efarinose 190a. var. *falcifolia*

1b. Plants conspicuously farinose 190b. var. *farinifera*

190a. *Primula falcifolia* var. *falcifolia*

镰叶雪山报春(原变种) lian ye xue shan bao chun (yuan bian zhong)

Plants efarinose. Fl. Jul.

* Damp meadows, *Abies* forests; 3300–4300 m. E Xizang (Mainling Xian, M₁og Xian).

190b. *Primula falcifolia* var. *farinifera* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

波密镰叶报春 bo mi lian ye bao chun

Abaxial surface of leaves, pedicel, and calyx pale yellow farinose. Fl. Jul.

* Alpine scrub; ca. 3700 m. E Xizang (Bomi Xian).

191. *Primula elizabethiae* Ludlow ex W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 205. 1937.

卵叶雪山报春 luan ye xue shan bao chun

Herbs perennial; stock 2–5 cm long, bulblike, formed by overlapping petioles and basal bud scales. Leaves in a rosette; petiole narrowly winged, 2–3 × as long as leaf blade; leaf blade ovate to ovate-lanceolate, 2.5–5 × 1.5–2.5 cm, base cordate to rounded or cuneate, margin denticulate, apex acute. Scape 12–20 cm, 1(–3)-flowered; bracts linear, 3–8 mm. Flower heterostylous. Pedicel 1–2 cm. Calyx green or tinged with red, cupular, 7–10 mm, parted to middle; lobes subquadrangular, apex rounded. Corolla yellow, exannulate; limb to 3.5 cm wide; lobes suborbicular, ca. 1.5 cm, wide, slightly emarginate. Pin flowers: corolla tube ca. 1.5 cm; stamens ca. 5 mm above base of corolla tube; style ca. 1.1 cm. Thrum flowers: corolla tube ca. 1.7 cm; stamens toward tube apex; style ca. 5 mm. Capsule cylindrical, ca. as long as calyx. Fl. Jun.

* Meadows; ca. 4500 m. E Xizang (Mainling Xian, M₁og Xian, Nyingchi Xian).

192. *Primula caveana* W. W. Smith, Rec. Bot. Surv. India 4: 218. 1911.

短朔圆叶报春 duan shuo yuan ye bao chun

Primula cana I. B. Balfour & Cave; *P. younghusbandiana* I. B. Balfour.

Herbs perennial; rhizome short, covered with withered leaves. Leaves in a rosette; petiole nearly as long as to 2–3 × as long as leaf blade, dilated and sheathed at base; leaf blade oblong to elliptic or obovate to suborbicular, 1–8 × 1–2.5 cm, abaxially copiously white farinose, adaxially densely glandular puberulent, base attenuate or abruptly constricted and short decurrent, deeply dentate, apex rounded. Scapes 2–12 cm, sparsely glandular; umbels 1–9-flowered; bracts linear to linear-lanceolate, 0.7–1.5 cm, farinose. Flowers heterostylous. Pedicel 1–2 cm, elongated to 4 cm in fruit, white farinose. Calyx tubular to tubular-campanulate, (5–)6–11 mm, white farinose, parted to 2/3 or below; lobes linear-lanceolate to narrowly oblong, apex acute to obtuse, rarely dentate. Corolla pale purple; tube (0.7–)0.9–1.3 cm; limb ca. 1.5 cm wide; lobes broadly obovate to suborbicular, margin entire to erose-crenulate. Pin flowers: stamens 3.5–4 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens 7–8 mm above base of corolla tube; style reaching middle of tube. Capsule globose, included in calyx. Fl. Jun.

Shaded rock crevices; 4800–5000 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

193. *Primula littledalei* I. B. Balfour & Watt, Notes Roy. Bot. Gard. Edinburgh 9: 179. 1916.

白粉圆叶报春 bai fen yuan ye bao chun

Primula consocia W.W. Smith.

Herbs perennial, base with withered leaves. Leaves in a rosette; petiole 2–11 cm; leaf blade orbicular to reniform, 1–7.5 cm wide, abaxially white farinose, adaxially puberulent, base deeply cordate to truncate, margin coarsely dentate to double-dentate, apex rounded; lateral veins subbasal. Scapes 4–18 cm, puberulent; umbels 3–15-flowered; bracts linear-lanceolate to lanceolate or oblanceolate, 0.5–1.5 cm. Flowers heterostylous. Pedicel 0.5–1.5(–3) cm, puberulent. Calyx campanulate, 6–8 mm, puberulent, white farinose, parted to 2/3 or below; lobes lanceolate to oblong-lanceolate, apex acute to obtuse. Corolla pink, lilac, or pale purple; tube 9–10(–13) mm; limb 1.5–2 cm wide; lobes broadly obovate, margin entire to crenulate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers with positions reciprocal. Capsule ovoid, slightly shorter than calyx. Fl. Jun.

* Rock crevices; 4300–5000 m. S Xizang.

194. *Primula baileyana* Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 82. 1926.

圆叶报春 *yuan ye bao chun*

Herbs perennial, with few withered leaves at base. Leaves in a rosette; petiole 1–8 cm; leaf blade suborbicular to reniform, 0.5–4 cm wide, abaxially copiously white farinose, adaxially densely glandular puberulent, base truncate to obscurely cordate, margin crenate to crenate-dentate, apex rounded. Scapes 3–18 cm, sparsely glandular; umbels 1–7-flowered; bracts linear, 4–12 mm. Flowers heterostylous. Pedicel 0.3–2 cm, white farinose. Calyx tubular to tubular-campanulate, 6–8.5 mm, white farinose, conspicuously 5-veined, parted to middle or below; lobes lanceolate-oblong, apex acute to obtuse. Corolla pale violet to violet; limb 1–2 cm wide; lobes broadly obovate, deeply emarginate; lobules entire to denticulate. Pin flowers: corolla tube ca. 1.1 cm; stamens at middle of tube; style ca. as long as tube. Thrum flowers: corolla tube 1.3–1.5 cm; stamens toward apex of tube; style reaching middle of tube. Capsule ovoid to oblong, ca. as long as calyx. Fl. Jun.

* Rock crevices, *Rhododendron* scrub in sheltered gullies; 4600–5000 m. SE Xizang.

195. *Primula rotundifolia* Wallich in Roxburgh, Fl. Ind. 2: 18. 1824.

大圆叶报春 *da yuan ye bao chun*

Primula cardiophylla I. B. Balfour & W.W. Smith; *P. cordata* I. B. Balfour ex W.W. Smith & Forrest; *P. cordifolia* Pax; *P. roxburghii* N. P. Balakrishnan.

Herbs perennial, with withered leaves and few bud scales at base. Leaves in a rosette; petiole 1–3 × as long as leaf blade; leaf blade suborbicular, 4–12 cm wide, abaxially yellow farinose or occasionally efarinose, adaxially sparsely glandular, base deeply cordate, margin irregularly coarse dentate, apex rounded to obscurely apiculate; lateral veins subpinnate. Scape 10–25(–30) cm, minutely glandular or occasionally farinose toward apex; umbels 1 or 2, superimposed, 2–16-flowered; bracts linear to subulate, 0.5–

1.5 cm, densely glandular. Flowers heterostylous. Pedicel 1–2 cm, elongated to 3 cm in fruit, farinose, minutely glandular. Calyx campanulate, 5–6 mm, farinose, parted to near base; lobes oblong-lanceolate, apex acute to obtuse; veins 3. Corolla pale purplish pink; tube ca. 2 × as long as calyx; limb 1.2–1.9 cm wide; lobes suborbicular to broadly ovate, margin entire to obscurely crenulate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, ca. 1 cm. Fl. Jun. $2n = 22$.

Rock crevices; 3500–5000 m. S Xizang [NE India, Nepal].

196. *Primula gambeliana* Watt, J. Linn. Soc., Bot. 20: 3. 1882.

长朔圆叶报春 *chang shuo yuan ye bao chun*

Herbs perennial, with overlapping ovate farinose bud scales at base. Leaves in a rosette; petiole usually 3–4 × as long as leaf blade; leaf blade ovate to suborbicular, 1–10 × 0.5–6 cm, efarinose, abaxially sparsely minutely glandular, base deeply cordate to occasionally truncate, margin dentate to crenate-dentate, apex obtuse to acute. Scape 3–25 cm, glabrous or sparsely minutely glandular; umbels (1 or) 2–8-flowered; bracts linear-lanceolate, 3–7 mm. Flowers heterostylous. Pedicel 2–10 mm, elongated to 2.5 cm in fruit, sparsely glandular. Calyx tubular-campanulate, 5–6.5 mm, parted to 3/5–2/3; lobes lanceolate, finely ciliate, apex acute. Corolla purple-pink to violet-purple; limb 1.5–2.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: corolla tube ca. 1.1 cm; stamens at middle of tube; style nearly reaching mouth. Thrum flowers: positions reciprocal. Capsule ca. 2 × as long as calyx. Fl. Jun. $2n = 22$.

Moss-covered crevices of wet cliffs; ca. 4500 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

197. *Primula glabra* Klatt, Linnaea 37: 500. 1872.

光叶粉报春 *guang ye fen bao chun*

Herbs perennial. Leaves in a compact rosette; petiole usually indistinct or occasionally nearly as long as leaf blade; leaf blade obovate-elliptic to oblanceolate or spatulate, 1–3 cm × 4–10 mm, abaxially sparsely minutely glandular, base attenuate, margin irregularly denticulate, apex rounded to obtuse. Scapes 2–8(–11) cm, efarinose, occasionally glandular toward apex; umbels subcapitate, 2–9(–12)-flowered; bracts ovate-lanceolate, 0.5–1.5 mm, subgibbous at base. Flowers heterostylous. Pedicel 1–2 mm, rarely to 5 mm. Calyx campanulate, 2.5–4 mm, parted to 1/3 or below; lobes oblong, apex rounded. Corolla pinkish purple to bluish violet, rarely white; tube ca. as long as to slightly longer than calyx; limb 4–7 mm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule ca. as long as calyx. $2n = 16$.

Peat, grassy hillsides, cliffs, alpine meadows, moist rocks; 4000–5000 m. Xizang, NW Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

1a. Calyx glandular; umbels usually

6–12-flowered 197a. subsp. *glabra*

1b. Calyx smooth; umbels usually

1–3-flowered 197b. subsp. *genestieriana*

197a. *Primula glabra* subsp. *glabra*

光叶粉报春(原亚种) *guang ye fen bao chun* (yuan ya zhong)

Umbels (2–)6–12-flowered. Calyx densely minutely capitate glandular. Fl. Jun.

Peat, grassy hillsides, cliffs; 4000–5000 m. SE Xizang [Bhutan, NE India, Nepal, Sikkim].

197b. *Primula glabra* subsp. *genestieriana* (Handel-Mazzetti) C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 224. 1990.

纤萼粉报春 *xian ting fen bao chun*

Primula genestieriana Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 59: 250. 1922; *P. doshongensis* W.W. Smith.

Umbels usually 1–3-flowered. Calyx smooth.

Alpine meadows, moist rocks; 4100–4200 m. E Xizang, NW Yunnan [N Myanmar].

The range in scape length and flower number per umbel makes it impractical to maintain *Primula genestieriana* as a separate species.

198. *Primula kongboensis* Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 72. 1926.

工布报春 *gong bu bao chun*

Herbs perennial. Petiole usually indistinct, membranous winged; leaf blade spatulate to oblong-spatulate, 0.7–1.5 cm × 2–5 mm, densely minutely glandular, base attenuate, margin obscurely erose-denticulate, apex rounded. Scapes 1.5–5 cm; umbels subcapitate, minutely capitate glandular; 2–10-flowered; bracts ovate to rhomboid-ovate, 2–3 × 1.5–2 mm, capitate glandular, base gibbous, occasionally 3-lobed, apex obtuse to rounded. Flowers heterostylous. Pedicel obsolete. Calyx campanulate, parted to near middle; lobes tinged with purple, oblong, glandular ciliolate, apex rounded. Corolla rose-pink to lilac; tube ca. 3 mm, nearly as long as calyx; limb 5–6 mm wide; lobes oblong-obovate, deeply emarginate. Pin flowers: stamens slightly exceeding middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule subglobose, ca. 2 mm in diam. Fl. Jun.

* Damp meadows; 4700–5000 m. E Xizang.

199. *Primula pseudoglabra* Handel-Mazzetti, Acta Horti Gothob. 2: 104. 1926.

松潘报春 *song pan bao chun*

Herbs perennial, forming tufts with many rosettes. Leaves in a rosette; petiole indistinct to nearly as long as leaf blade, narrowly winged; leaf blade obovate to obovate-oblong, 0.8–2.5 cm × 3–8 mm, sparsely minutely glandular, base attenuate, margin subentire to obscurely denticulate above middle, apex rounded to obtuse. Scapes 1.5–5 cm, densely glandular; umbels capitate, many flowered; bracts green, narrowly oblong, 2.5–3.5 mm, base slightly gibbous, apex obtuse. Flowers heterostylous. Pedicel 0.5–1 mm. Calyx

green, tubular-campanulate, 3–5 mm, densely glandular puberulent, parted to ± middle; lobes oblong, glandular ciliolate, apex obtuse. Corolla pink to pale bluish purple; tube ca. as long as calyx; limb 5.5–7 mm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens slightly above middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule elliptic, ca. as long as calyx. Fl. May.

* Grassy slopes; 3000–3500 m. NW Sichuan (Pingwu Xian, Songpan Xian).

200. *Primula concinna* Watt, J. Linn. Soc., Bot. 20: 5. 1882.

雅洁粉报春 *ya jie fen bao chun*

Primula farinosa Linnaeus var. *concinna* (Watt) Pax.

Herbs perennial, usually less than 2.5 cm tall, forming dense cushionlike mats. Leaves in a rosette; petiole usually indistinct, rarely ca. 1/2 as long as leaf blade; leaf blade oblanceolate to spatulate or occasionally obovate, 0.6–2.5 cm × 2–6 mm, abaxially densely yellow farinose, adaxially efarinose or sometimes scarcely farinose, base attenuate, margin subentire or crenulate above middle, rarely distinctly dentate, apex obtuse to acute. Scapes less than 1 cm, sometimes obsolete, 1–6-flowered; bracts linear to linear-lanceolate, 2–6 mm. Flowers heterostylous. Pedicel 4–10 mm. Calyx campanulate, 3–5 mm, ± farinose, parted to middle; lobes lanceolate to broadly linear, apex obtuse to acute. Corolla pale rose-purple or white; tube slightly longer than calyx; limb 7–10 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching annulus. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. Jun.

Damp meadows, moraines; 4000–5000 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

201. *Primula rhodochroa* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 15: 75. 1926.

密丛小报春 *mi cong xiao bao chun*

Herbs perennial, less than 3 cm tall. Leaves in a rosette; petiole usually slightly shorter than leaf blade; leaf blade oblanceolate to narrowly obovate, 0.5–2 cm × 3–5 mm, abaxially densely farinose, adaxially sparsely glandular, base short cuneate-attenuate, margin denticulate to dentate, apex obtuse to rounded. Scapes less than 1 cm, usually indistinct, conspicuously farinose, 1–4-flowered; bracts 2 or 3, linear, 4–5 mm, farinose. Flowers heterostylous. Pedicel to 8 mm, farinose. Calyx tubular-campanulate, 5–7 mm, farinose, parted to 1/3, distinctly 5-veined; lobes ovate-triangular, apex acute or sub-obtuse. Corolla rose-purple, rarely white; tube ca. as long as calyx; limb 0.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens slightly below middle of corolla tube; style reaching annulus. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. Jun.

Moist and moss-covered cliffs, open grassy slopes, *Rhododendron* scrub; 3800–5000 m. E Xizang [N Myanmar].

1a. Farina cream-white; corolla 0.5–1.5 cm

in diam.; leaf margin dentate 201a. var. *rhodochroa*
1b. Farina yellow; corolla 1.5–2 cm in
diam.; leaf margin denticulate 201b. var. *geraldinae*

201a. *Primula rhodochroa* var. *rhodochroa*

密丛小报春(原变种) mi cong xiao bao chun (yuan bian
zhong)

Leaves densely cream-white farinose abaxially, margin
with 3 or 4 teeth on each side. Corolla 0.5–1.5 cm in diam. Fl.
Jun.

Moss-covered cliffs, open grassy slopes, *Rhododendron* scrub;
4000–5000 m. E Xizang [N Myanmar].

201b. *Primula rhodochroa* var. *geraldinae* (W. W. Smith)
Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 189. 1990.

洛拉小报春 luo la xiao bao chun

Primula geraldinae W. W. Smith, Trans. Bot. Soc.
Edinburgh 33: 116. 1941.

Leaves yellow farinose abaxially, denticulate. Corolla 1.5–2
cm in diam.

* Moist cliffs; 3800–4600 m. E Xizang.

202. *Primula meiotera* (W. W. Smith & H. R. Fletcher) C. M.
Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2):
190. 1990.

深齿小报春 shen chi xiao bao chun

Primula rhodochroa W. W. Smith var. *meiotera* W. W.
Smith & H. R. Fletcher, J. Linn. Soc., Bot. 52: 339. 1942.

Herbs perennial. Petiole obscure; leaf blade spatulate to
oblanceolate, 1–3 cm × 2–5 mm, abaxially densely white fari-
nose, adaxially sparsely glandular, base cuneate-attenuate, with
3–5 ± runcinate coarse teeth on each side of margin, apex
acute. Scapes 0.3–4 cm, white farinose, 1- or 2-flowered; bracts
linear, to 5 mm. Flowers homostylous. Pedicel 7–10 mm,
farinose. Calyx cupular, ca. 4 mm, sparsely white farinose,
parted below middle; lobes narrowly lanceolate to oblong-
lanceolate, apex acute to subobtuse; sinus between lobes
rounded. Corolla bluish purple; tube nearly as long as calyx;
limb 4.5–6 mm wide; lobes obovate, emarginate. Stamens
toward apex of corolla tube. Style ca. as long as tube. Capsule
oblong, ca. as long as calyx. Fl. Jul.

* Among rocks; ca. 4300 m. E Xizang (Mainling Xian).

203. *Primula algida* Adams in Weber & Mohr, Beitr. Naturk.
1: 46. 1805.

寒地报春 han di bao chun

Herbs perennial. Leaves in a rosette; petiole usually in-
conspicuous, rarely ca. 1/2 as long as leaf blade; leaf blade
obovate-oblong to oblanceolate, 1.5–5(–7) × 0.5–1.5(–2.5)
cm, abaxially densely to very sparsely yellow or white
farinose, rarely efarinose, adaxially efarinose, base
attenuate, margin denticulate, rarely subentire, apex rounded
to obtuse. Scapes (3–)5–20 cm, elongated to 35 cm in fruit,
farinose toward apex or efarinose; umbels 3–12-flowered;

bracts strongly reflexed after anthesis, linear to linear-
lanceolate, 3–11 mm, base slightly gibbous. Flowers
heterostylous. Pedicel 1.5–3 mm, elongated to 1.5 cm in
fruit, farinose or efarinose. Calyx campanulate, 6–8(–10) mm,
efarinose or scarcely farinose outside, usually farinose inside,
parted to middle, 5-ribbed; lobes often tinged with purple,
oblong to lanceolate. Corolla violet, rarely white; tube nearly
as long as calyx; limb 0.8–1.5 cm wide; lobes obovate, deeply
emarginate. Pin flowers: stamens in lower 1/2 of corolla tube;
style ca. 2/3 as long as tube. Thrum flowers with positions
reciprocal. Capsule oblong, slightly longer than calyx. Fl.
May–Jun. $2n = 18, 44$.

South-facing mountain slopes, wet meadows; 1600–3200 m.
NW Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, N Mongolia,
Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

204. *Primula farinosa* Linnaeus, Sp. Pl. 1: 143. 1753.

粉报春 fen bao chun

Herbs perennial. Leaves numerous, in a dense rosette;
petiole to nearly as long as leaf blade; leaf blade oblong-obo-
vate to oblong-lanceolate, 1–7 × 0.3–4 cm, farinose or
efarinose, base attenuate, margin remotely denticulate to sub-
entire, apex subrounded to obtuse. Scapes 3–15(–30) cm,
usually farinose toward apex; umbels usually many flowered;
bracts narrowly lanceolate to acuminate-subulate, 3–8 mm,
base dilated, gibbous. Flowers heterostylous. Pedicels
unequal, 3–15 mm, elongated to 2.5 cm in fruit. Calyx
campanulate, 4–6 mm, usually farinose inside, parted to 1/3–
1/2, 5-ribbed; lobes ovate-oblong to triangular, short ciliate.
Corolla lilac to purple; tube ca. as long as to slightly longer
than calyx; limb 0.8–1 cm wide; lobes cuneate-obovate, deeply
emarginate. Pin flowers: stamens at middle of corolla tube;
style ca. 3 mm. Thrum flowers: stamens in upper 1/2 of corolla
tube; style ca. 1.2 mm. Capsule cylindrical, slightly longer than
calyx. $2n = 18, 36, 72$.

Wet meadows, marshes, valley thickets; ca. 1200 m. Heilong-
jing, Jilin, Nei Mongol [Kazakstan, Mongolia, Russia; Europe].

1a. Plants farinose 204a. var. *farinosa*
1b. Plants efarinose 204b. var. *denudata*

204a. *Primula farinosa* var. *farinosa*

粉报春(原变种) fen bao chun (yuan bian zhong)

Primula farinosa subsp. *xanthophylla* (Trautvetter & C.
Meyer) Kitagawa; *P. farinosa* var. *xanthophylla* Trautvetter &
C. Meyer.

Leaves white or yellow farinose abaxially. Fl. May–Jun.

Wet meadows, marshes, valley thickets; ca. 1200 m. Jilin
[Kazakstan, Mongolia, Russia; Europe].

204b. *Primula farinosa* var. *denudata* W. D. J. Koch, Syn.
Fl. Germ. Helv. 586. 1837.

裸报春 luo bao chun

Primula gigantea Jacquin.

Leaves glabrous, efarinose abaxially.

Wet meadows; ca. 1200 m. Heilongjiang, Jilin, Nei Mongol [Kazakstan, Mongolia, Russia; Europe].

205. *Primula stenocalyx* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 498. 1881.

狭萼报春 xia e bao chun

Primula biondiana Petitmengin; *P. cognata* Duthie; *P. kanseana* Pax & K. Hoffmann; *P. leptopoda* Bureau & Franchet; *P. stenocalyx* var. *luteofarinosa* W.W. Smith.

Herbs perennial. Leaves in a rosette; petiole usually indistinct or occasionally slightly shorter than leaf blade; leaf blade obovate to oblanceolate or spatulate, 1–5 × 0.5–1.5 cm, efarinose or white or yellow farinose abaxially, base attenuate, margin subentire, crenulate to dentate, apex rounded to obtuse. Scapes 1–15 cm, glandular or occasionally farinose toward apex; umbels 4–16-flowered; bracts narrowly lanceolate, 5–10(–15) mm. Flowers heterostylous. Pedicel 3–15 mm, ± glandular. Calyx tubular, 6–10 mm, parted to 1/3–1/2, 5-ribbed; lobes oblong to lanceolate, ciliolate, apex acute to obtuse. Corolla bluish lavender to pink; tube 0.9–1.5 cm; limb 1.5–2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers with stamens ca. 2 mm above base of corolla tube; style reaching level of calyx. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. May–Jul. $2n = 16^*$.

* South-facing grassy slopes, gullies, peat; 2700–4300 m. S Gansu, E Qinghai, W Sichuan, NE Xizang.

206. *Primula caldaria* W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 14: 35. 1923.

匍枝粉报春 pu zhi fen bao chun

Primula caldaria var. *nana* W.W. Smith & Forrest.

Herbs perennial. Stolons 5–20 cm, terminated in a leaf rosette, with alternate leaves on lower part. Petiole narrowly winged, nearly as long as leaf blade; leaf blade oblanceolate, 2–15(–25) × 0.6–1.8(–3.5) cm, abaxially white farinose, adaxially glabrous, base long attenuate, margin remotely blunt denticulate above middle, apex rounded to obtuse. Scapes (5–) 8–35(–45) cm, farinose toward apex; umbels 10–30-flowered. Flowers heterostylous. Pedicel 5–12 mm, elongated to 2 cm in fruit, usually white farinose. Calyx campanulate, ca. 4.5 mm, ± farinose, parted to middle; lobes lanceolate, apex acute. Corolla white or violet; tube 6–7 mm; limb 5–7 mm wide; lobes obovate, emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule globose, nearly as long as calyx. Fl. May. $2n = 16^*$.

* Gullies, near hot springs; 2200–3000 m. E Xizang, NW Yunnan.

207. *Primula fangingensis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

梵净报春 fan jing bao chun

Herbs perennial. Leaves in a rosette; petiole inconspicuous to nearly as long as leaf blade, narrowly winged; leaf blade obovate to oblong-obovate, 2.5–9(–13) × 1–2.5 cm, abaxially sparsely minutely glandular, base attenuate, margin erose-denticulate, apex rounded to obtuse. Scapes 10–16 cm, cream-white farinose toward apex; umbels 12–16-flowered; bracts lanceolate, 6–7 mm, base slightly gibbous, apex sub-obtuse. Flowers heterostylous. Pedicel 5–10 mm, cream-white farinose. Calyx campanulate, 6–7.5 mm, densely minutely glandular, parted to middle; tube white farinose; lobes oblong to obovate-oblong, apex obtuse. Corolla rose-purple; tube 6.5–8 mm; limb 1.5–2 cm wide; lobes obovate, 6.5–9 mm, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule unknown. Fl. May.

* Shaded grassy slopes, rocks; 2100–2300 m. NE Guizhou (Fanjing Shan).

208. *Primula fistulosa* Turkevicz, Fl. Asiat. Ross. 2(1): 23. 1923.

箭报春 jian bao chun

Primula farinosa Linnaeus subsp. *fistulosa* (Turkevicz) W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole obsolete or inconspicuous, broadly winged; leaf blade oblong to oblong-oblanceolate, 2–6(–13) × 0.5–1.5 cm, efarinose, base attenuate, margin irregularly denticulate, apex acuminate to acute. Scapes 5–20 cm, elongated to 28–49 cm in fruit, fistular, 4–6 mm in diam. at base, constricted below inflorescences; umbels globose, usually many flowered; bracts many, oblong-ovate to ovate-lanceolate, 3–4(–6.5) mm, base slightly gibbous, apex acute. Flowers heterostylous. Pedicel usually 0.8–1.5 cm, glandular pubescent. Calyx cupular, 4–5(–6) mm, gradually dilated upward from base, parted to 1/3–1/2; lobes oblong-lanceolate, apex acute. Corolla rose-violet; tube 6–7 mm; limb 0.8–1.4 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers: stamens in upper 1/2 of corolla tube; style ca. 1.5 mm. Capsule globose, nearly as long as calyx. Fl. May–Jun.

Wet areas in lowlands, meadows. Heilongjiang, Nei Mongol [Mongolia, E Russia].

209. *Primula longiscapa* Ledebour, Mém. Acad. Imp. Sci. St. Pétersbourg Hist. Acad. 5: 520. 1815.

长葶报春 chang ting bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole usually indistinct, occasionally ca. 1/2 as long as leaf blade; leaf blade oblong-obovate to narrowly oblong or oblanceolate, 2–10 × 0.5–2 cm, tapered to base, margin entire to obscurely crenulate, apex rounded to obtuse. Scape 10–30 cm, elongated to 70 cm in fruit; umbels many flowered; bracts narrowly oblong-lanceolate, 4–10 mm, slightly auriculate at base. Flowers heterostylous. Pedicel erect, 3–10 mm, elongated to 0.6–3 cm in fruit. Calyx tubular-campanulate, 4–6 mm, parted

to 1/3 or slightly below; lobes lanceolate, white farinose inside and on margin, apex subobtusate. Corolla rose-violet; tube 5–7 mm, slightly longer than calyx; limb 6–10 mm wide; lobes obovate, ca. 2.5 mm, deeply emarginate. Thrum flowers: stamens ca. 3 mm above base of corolla tube; style reaching insertion of stamens. Capsule oblong, nearly 2 × as long as calyx. Fl. May. $2n = 18$.

Pastures in river valleys; ca. 1200 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, E Russia, Tajikistan, Turkmenistan, Uzbekistan].

210. *Primula erratica* W.W. Smith, Proc. Linn. Soc. London 153: 120. 1941.

甘南报春 gan nan bao chun

Herbs perennial, occasionally producing short stolons from base. Leaves in a rosette; petiole not well differentiated; leaf blade oblanceolate to narrowly obovate, 1.5–4 cm × 5–10 mm, minutely glandular and sometimes sparingly white farinose abaxially, base attenuate, margin sharply dentate, rarely subentire, apex rounded to obtuse. Scapes 3–10 cm, glandular or scarcely farinose toward apex; umbels (1 or) 2–8-flowered; bracts ovate to lanceolate, 1.5–2 mm, base slightly gibbous. Flowers heterostylous. Pedicel 3–12 mm, scarcely farinose. Calyx narrowly campanulate, 4–6 mm, sparingly farinose, parted to near middle; lobes lanceolate, apex acute to subobtusate. Corolla rose-purple; tube ca. 7 mm; limb 0.8–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style slightly shorter than tube. Thrum flowers with positions reciprocal. Capsule subglobose, shorter than calyx. Fl. Mar.

* Grassy mountain slopes; 2700–3000 m. S Gansu (Zhouqu Xian), NW Sichuan (Dajin Xian).

211. *Primula efarinosa* Pax in Engler, Pflanzenr. IV. 237(Heft 22): 79. 1905.

无粉报春 wu fen bao chun

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade; leaf blade oblong to narrowly ovate or lanceolate, 2.5–5 × 0.6–1.6 cm, enlarged to 8 × 2.8 cm at fruiting, efarinose, abaxially sparsely minutely glandular, base attenuate, margin erose-denticulate, apex rounded to obtuse. Scapes 10–12 cm, elongated to 40 cm in fruit, glandular puberulent toward apex; umbels 6–20-flowered; bracts ovate-lanceolate to lanceolate, 5–6 mm, base slightly saccate. Flowers heterostylous. Pedicel 0.8–1.2 cm, elongated to 1.5 cm in fruit, densely glandular puberulent. Calyx tubular to tubular-campanulate, 6–7.5 mm, ± constricted at base, sparsely minutely glandular, parted to 1/3; lobes ovate to oblong, apex subobtusate. Corolla violet; tube ca. as long as calyx; limb 1.2–1.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers: stamens in upper 1/2 of corolla tube; style ca. 1 mm. Capsule oblong, slightly longer than calyx. Fl. May. $2n = 16^*$.

* Grassy mountain slopes, open forests; 2100–2800 m. W Hubei, E Sichuan.

212. *Primula huashanensis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

华山报春 hua shan bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole inconspicuous to nearly as long as leaf blade; leaf blade ovate-elliptic to elliptic-oblancheolate, 1.5–5.5 × 0.7–1.3 cm, enlarged to 7 × 1.8 cm at fruiting, tapered to base, membranous when dry, adaxially puberulent, sparsely minutely glandular, margin erose-denticulate, apex rounded to obtuse. Scapes 4–7 cm, glandular toward apex; umbels 2–5-flowered; bracts lanceolate, 3–5 mm, base slightly gibbous, apex acuminate. Flowers heterostylous. Pedicel 6–9 mm, minutely glandular. Calyx campanulate, 5.5–6.5 mm, sparsely glandular, parted to 2/3; lobes oblong, glandular ciliolate, apex obtuse to acute. Corolla purple; tube 7–9 mm; limb 1.3–1.6 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style slightly shorter than tube. Thrum flowers with positions reciprocal. Capsule unknown. Fl. May.

* Grassy mountain slopes. C Shaanxi (Hua Shan).

213. *Primula obsessa* W. W. Smith, Trans. Roy. Soc. Edinburgh 61(1): 63. 1943.

肥满报春 fei man bao chun

Herbs perennial, efarinose. Leaves not yet fully developed at anthesis, indistinctly petiolate, ovate to oblong, 1.5–2 × 0.3–0.6 mm, glabrous or sparsely minutely glandular, base attenuate, margin denticulate, apex obtuse. Scapes glabrous, 4–5 cm; umbels 3–10-flowered; bracts lanceolate to subulate, 3–5 mm, base slightly gibbous, apex acuminate. Flowers heterostylous. Pedicel 5–8 mm. Calyx narrowly campanulate 5–5.5 mm, parted to near middle; lobes ovate-oblong to oblong, rounded to obtuse at apex. Corolla rose-purple; tube 4.2–4.8 mm; limb 5–8 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2.3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens ca. 3 mm above base of corolla tube; style ca. 1 mm. Capsule unknown.

* Habitat unknown. E Sichuan (Chengkou Xian).

Primula obsessa is known only from the type collection made by Farges during 1892–1896.

214. *Primula sertulum* Franchet, J. Bot. (Morot) 9: 451. 1895.

小伞报春 xiao san bao chun

Herbs perennial, efarinose. Leaves in a rosette, indistinctly petiolate, oblanceolate, 3–12 × 0.7–2 cm, abaxially minutely capitate glandular, base long cuneate-attenuate, margin irregularly sharp dentate, apex obtuse to subrounded. Scapes 5–15 cm, sparsely glandular; umbels 6–20-flowered; bracts lanceolate, 5–10 mm, base slightly gibbous. Flowers heterostylous. Pedicel 0.8–2 cm, minutely glandular. Calyx campanulate, 4.5–6 mm, sparsely glandular outside, pale-yellow farinose inside, parted to middle or below; lobes lanceolate to oblong, apex acute to subobtusate. Corolla violet or pink; tube 7–8 mm; limb ca. 1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla

tube; style reaching annulus. Thrum flowers with positions reciprocal. Capsule ovoid, ca. 3 mm in diam. Fl. May. $2n = 16^*$.

* Rock crevices exposed to dripping water; 1400–2000 m. E Sichuan (Chengkou Xian, Nanchuan Xian).

215. *Primula qinghaiensis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

青海报春 qing hai bao chun

Herbs perennial. Leaves \pm dimorphic; outer leaves long petiolate, broadly ovate, 1–4 mm wide, abaxially densely white farinose, usually withered during anthesis; petiole of inner leaves 3–4 \times as long as leaf blade; leaf blade broadly ovate to reniform, 2–7 cm wide, abaxially sparsely glandular and occasionally fugacious white farinose, base subcordate, margin irregularly sharp incised-dentate, apex rounded. Scapes 9–25 cm, glandular pubescent; umbels 3–12-flowered; bracts lanceolate, 0.5–1.5 cm, leaflike, apex acuminate. Flowers heterostylous. Pedicel 1–4 mm, glandular puberulent, white farinose at base. Calyx campanulate, 5.5–8.5 mm, white farinose at base and inside, parted to below middle; lobes lanceolate, glandular ciliolate. Corolla yellow; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube 1.2–1.3 cm; stamens ca. 4 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: corolla tube ca. 1.5 cm; stamens toward apex of corolla tube; style ca. 3 mm. Capsule subglobose, 3–4 mm in diam.

* Shaded damp rock crevices; 3900–4300 m. S Qinghai (Nangqian Xian).

216. *Primula flava* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 497. 1881.

黄花粉报春 huang hua fen bao chun

Primula citrina I. B. Balfour & Purdom.

Herbs perennial. Leaves in a rosette; petiole nearly as long as leaf blade, rarely 2–3 \times as long as leaf blade; leaf blade broadly ovate to elliptic or occasionally suborbicular, 1.5–4 \times 1–2.5 mm, membranous when dry, abaxially unevenly fugacious white farinose, adaxially subglabrous or sparsely pubescent, base usually attenuate, occasionally subrounded and abruptly short attenuate, margin bluntly serrate, rarely sharply dentate, apex subrounded. Scapes 2–10 cm, sparsely pubescent; umbels 2–13-flowered; bracts lanceolate, 5–10 mm, glandular puberulent. Flowers heterostylous. Pedicel 0.8–3 cm, glandular puberulent. Calyx campanulate, 4–6 mm, puberulent, white farinose at base, parted to below middle; lobes narrowly oblong to lanceolate, glandular ciliolate, usually farinose inside, apex obtuse to acute. Corolla yellow, becoming green when dry; tube 1.2–1.4 cm; limb 1–1.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near middle of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule usually slightly shorter than calyx. Fl. May–Aug.

* Damp rocks; 3000–5000 m. S and W Gansu, E Qinghai, N Sichuan.

217. *Primula tenuipes* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

纤柄报春 xian bing bao chun

Herbs perennial. Leaves in a rosette; petiole ca. 3 \times as long as leaf blade; leaf blade ovate to suborbicular, 1.5–7 cm wide, abaxially densely minutely glandular and unevenly white farinose, adaxially sparingly glandular, base shallowly cordate, margin double-dentate, apex rounded. Scapes 5.5–14 cm, glabrous; umbels 2–8-flowered; bracts lanceolate, short-stalked glandular. Flowers heterostylous. Calyx broadly-campanulate, 5.5–6.5 mm, densely minutely glandular outside, usually white farinose inside, parted to middle or below; lobes oblong, apex acute to obtuse. Corolla rose-purple with a yellow eye; tube 1–1.3 cm; limb ca. 1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule unknown. Fl. May.

* Bordering rocks on S-facing mountain slopes; ca. 4400 m. NW Sichuan (Jinchuan Xian).

218. *Primula jaffreyana* King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 55: 228. 1886.

藏南报春 zang nan bao chun

Primula lhasaensis I. B. Balfour & W.W. Smith.

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade; leaf blade obovate-elliptic to oblanceolate, 4–10 \times 1.5–2 cm, enlarged to 20 \times 4 cm at fruiting, abaxially white or cream-white farinose, adaxially densely minutely brownish glandular, base attenuate, margin irregularly dentate to sometimes remotely crenulate, apex rounded to obtuse. Scapes 5–25 cm, farinose toward apex; umbels 3–13-flowered; bracts linear-lanceolate to subulate, 5–10(–15) mm, base slightly gibbous. Flowers heterostylous. Pedicel usually 0.5–2 cm, white farinose. Calyx tubular, 7–12 mm, parted to near middle, 5-ribbed; lobes lanceolate, usually farinose inside and on margin, apex acute. Corolla pink to pale bluish purple; tube 1.3–1.5 cm; limb 1.2–2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching or slightly longer than mouth. Thrum flowers with positions reciprocal. Capsule oblong, ca. as long as to slightly longer than calyx. Fl. Jul–Sep.

* Grassy mountain slopes, rock crevices, *Pinus* woodlands; 2700–5300 m. S Xizang.

219. *Primula fernaldiana* W. W. Smith, Trans. Bot. Soc. Edinburgh 33: 115. 1941.

雅东粉报春 ya dong fen bao chun

Herbs perennial. Leaves in a rosette; petiole 1/4–1/3 as long as leaf blade; leaf blade oblanceolate to obovate, 5–13 \times 1–2.5(–3.5) cm, abaxially sparingly pale-yellow farinose, base long attenuate, margin entire or remotely obscure denticulate, apex obtuse. Scape (12–)18–35 cm, efarinose; umbels 5–14-flowered; bracts linear-lanceolate, 2.5–4 mm, scarcely farinose. Flowers heterostylous. Pedicel (1.5–)2–4.5 mm. Calyx campanulate, 4–6 mm, sparingly white farinose

outside, densely so inside, parted to 1/3; lobes oblong-lanceolate, apex obtuse to acute. Corolla bluish purple, 1.3–1.8 mm in diam.; lobes obovate, 6–7 mm, deeply emarginate. Pin flowers: corolla tube ca. 1 cm; stamens ca. 3 mm above base of corolla tube; style ca. 5 mm. Thrum flowers: corolla tube ca. 1.3 cm; stamens at middle of corolla tube; style ca. 2 mm. Capsule cylindrical, ca. 2 × as long as calyx. Fl. May.

* Wet meadows; ca. 4000 m. SW Sichuan.

220. *Primula fangii* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 294. 1990.

金川粉报春 jin chuan fen bao chun

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade; leaf blade elliptic to elliptic-oblong, 2.5–7 cm, enlarged to 14 cm at fruiting, 0.5–2.3 cm wide, abaxially copiously white farinose, adaxially densely minutely brownish glandular, base attenuate, margin subentire to obscurely crenulate, apex rounded. Scapes (8–)10–25 cm; umbels (3–)5–25-flowered; bracts lanceolate, 4–8 mm, apex acuminate. Flowers heterostylous. Pedicel 1.2–3 cm, elongated to 7 cm in fruit, initially white farinose. Calyx campanulate, 5–6 mm, ± white farinose outside, cream-yellow farinose inside, parted 1/3–1/2; lobes ovate to narrowly triangular, apex acute. Corolla rose to rose-purple; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube 8–9 mm; stamens ca. 3 mm above base of corolla tube; style nearly reaching mouth. Thrum flowers: corolla tube thinner, ca. 1 cm; stamens in upper 1/2 of corolla tube; style ca. 1.5 mm. Capsule cylindrical, ca. 2 × as long as calyx. Fl. May–Jul.

* Grassy mountain slopes, shrubs; 2700–3100 m. W Sichuan.

221. *Primula clutterbuckii* Kingdon-Ward, Ann. Bot. (Oxford) 44: 122. 1930.

短茎粉报春 duan jing fen bao chun

Herbs perennial. Stolens 0.5–1.5 cm, terminated in a leaf rosette. Petiole nearly as long as leaf blade; leaf blade spatulate to narrowly obovate, 0.8–2 cm × 6–9 mm, abaxially cream-white or cream-yellow farinose, adaxially scarcely farinose or nearly efarinose, base attenuate, margin sharply incised-serrate, apex subrounded. Scapes 0.8–2.5 cm, ± farinose, 1- or 2-flowered; bracts usually 2, linear to linear-lanceolate, 5–12 mm. Flowers homostylous. Pedicel 6–9 mm, sparingly farinose. Calyx narrowly campanulate, 8–10 mm, cream-yellow farinose outside, parted to middle or slightly below, 5-veined; lobes lanceolate, apex acute. Corolla deep purple; tube 1.5–1.6 cm; limb 1.5–2.2 cm wide; lobes obovate, emarginate. Stamens toward apex of corolla tube. Style slightly exserted. Capsule oblong, 6–7 mm. Fl. May–Jun.

* Shaded rock crevices of gneiss and granite cliffs; ca. 3600 m. SE Xizang.

222. *Primula tayloriana* H. R. Fletcher, J. Roy. Hort. Soc. 74: 210. 1949.

淡粉报春 dan fen bao chun

Herbs perennial. Leaves in a rosette; petiole not well-differentiated; leaf blade obovate, 4–5 × 2–3 cm; tapered to base,

abaxially sparingly cream-yellow farinose, margin denticulate to crenulate, apex rounded. Scapes 4–10 cm, farinose, especially near apex; umbels yellow farinose, 2–8-flowered; bracts linear to linear-lanceolate, 3–7 mm. Flowers heterostylous. Pedicel suberect, 0.5–1.5 cm. Calyx campanulate, 5–7 mm, parted to below middle; lobes ± spreading, lanceolate, apex acute, with a conspicuous midvein. Corolla bluish purple; tube 1.1–1.2 cm; limb 1.6–2.5 cm wide; lobes obovate, 5–6 mm, deeply emarginate. Pin flowers: stamens reaching middle of corolla tube; style ca. as long as to slightly longer than tube. Thrum flowers with positions reciprocal. Capsule oblong, slightly longer than calyx. Fl. Apr–May.

* Rock crevices; ca. 3000 m. E Xizang.

223. *Primula scopulorum* I. B. Balfour & Farrer in I. B. Balfour, Trans. Bot. Soc. Edinburgh 27: 243. 1917.

米仓山报春 mi cang shan bao chun

Herbs perennial, with thick stringy roots. Leaves in a rosette; petiole 1/4–1/3 as long as leaf blade; leaf blade elliptic to obovate-elliptic, 2–4.5 × 1–2.3 cm, abaxially densely white farinose becoming cream-yellow when dry, base attenuate, margin irregularly blunt dentate, apex obtuse. Scapes 2.5–6 cm, scarcely farinose near base; umbels (2 or)3–5-flowered; bracts lanceolate, 4–6 mm. Flowers heterostylous. Pedicel 0.8–2 cm, scarcely farinose. Calyx campanulate, 5–7 mm, sparingly farinose outside, densely so inside, parted slightly below middle, 5-ribbed; lobes lanceolate. Corolla rose-purple to pale purple; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube 1.2–1.3 cm; stamens ca. 2 mm above base of corolla tube; style reaching mouth. Thrum flowers: corolla tube 1.4–1.5 cm; stamens 1.1–1.2 cm above base of corolla tube; style 2.5–3 mm. Capsule nearly as long as calyx. Fl. Apr–May.

* Shaded moist areas, rock crevices; 1500–3000 m. S Gansu, S Shaanxi, NE Sichuan.

224. *Primula knuthiana* Pax in Engler, Pflanzenr. IV. 237(Heft 22): 79. 1905.

阔萼报春 kuo e bao chun

Primula knuthiana var. *brevipes* Pax; *P. knuthiana* var. *major* Pax.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, to nearly as long as leaf blade; leaf blade oblong-obovate to oblanceolate, 3–17. 1–2 cm, submembranous when dry, abaxially densely cream-white farinose, base cuneate-attenuate, margin remotely denticulate, apex subrounded to obtuse. Scapes 4.5–30 cm, scarcely farinose toward apex; umbels 2–30-flowered; bracts linear-lanceolate to subulate, 3–6 mm. Flowers heterostylous. Pedicel 1–2 cm, sparingly white farinose or glandular. Calyx campanulate, 5–7 mm, glandular or sparingly white farinose outside, densely farinose inside, parted usually slightly below middle; lobes triangular, apex acute, midvein obscure. Corolla bluish purple or pale purple; tube (7–)8–10 mm; limb ca. 1.5 cm wide; lobes broadly obovate, 5–8 mm, deeply emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. 6 mm. Thrum flowers:

stamens ca. 7 mm above base of corolla tube; style ca. 1.5 mm. Capsule subglobose, slightly shorter than calyx. Fl. May–Jul. $2n = 16^*$.

* Mountain woodlands; 2400–2800 m. Shaanxi (Qinling Xian).

225. *Primula pulchella* Franchet, Bull. Soc. Bot. France 35: 429. 1888.

丽花报春 li hua bao chun

Primula compsantha I. B. Balfour & Forrest; *P. pulchelloides* Kingdon-Ward; *P. sulphurea* Pax & K. Hoffmann var. *rosea* Pax & K. Hoffmann.

Herbs perennial. Leaves in a rosette; petiole usually inconspicuous, occasionally to 1/2 as long as leaf blade; leaf blade lanceolate to linear-lanceolate or oblanceolate, 3–15 × 5–20 cm, abaxially very densely bright yellow or cream-yellow farinose, base long attenuate, margin denticulate to occasionally subentire, usually narrowly revolute, apex obtuse or occasionally acute. Scapes 8–30 cm, farinose toward apex; umbels 3–30-flowered; bracts linear to linear-lanceolate, 3–8(–10) mm. Flowers heterostylous. Pedicel 0.5–2.5 cm, sparingly yellow farinose. Calyx campanulate, 4–8(–10) mm, parted to ± middle, copiously farinose inside and at base of lobes; lobes lanceolate to narrowly lanceolate, apex acute. Corolla violet to deep violet-purple; tube 0.8–1.2 cm; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, slightly longer to 2 × as long as calyx. Fl. Jun–Jul.

* Damp meadows, woodland margins; 2000–4500 m. SW Sichuan, E Xizang, NW Yunnan.

226. *Primula prattii* Hemsley, J. Linn. Soc., Bot. 29: 314. 1892.

雅砻黄报春 ya long huang bao chun

Primula sulphurea Pax & K. Hoffmann.

Herbs perennial, with fibrous remains of old leaves at base. Leaves in a rosette; petiole inconspicuous to 1/2 as long as leaf blade, narrowly winged; leaf blade spatulate to narrowly lanceolate or linear-oblanceolate, 1.5–8 × 0.2–1 cm, abaxially densely yellow farinose, base attenuate, margin crenate and often narrowly revolute, apex subobtuse. Scapes 6–25 cm; umbels 4–12-flowered; bracts lanceolate to linear-lanceolate, 4–10 mm, base slightly gibbous. Flowers heterostylous. Pedicel 0.5–2.5 cm, initially farinose, becoming efarinose. Calyx campanulate to narrowly campanulate, 5–8.5 mm, densely farinose inside, parted to middle or slightly below; lobes narrowly triangular to suboblanceolate, apex acute to subacuminate. Corolla bright yellow; tube 1–1.2 cm; limb 1.5–2 cm wide; lobes elliptic, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style slightly shorter than tube. Thrum flowers with positions reciprocal. Capsule oblong, slightly longer to 2 × as long as calyx.

* Damp meadows; 3000–4300 m. W Sichuan.

227. *Primula nutantiflora* Hemsley, J. Linn. Soc., Bot. 29: 313. 1892.

俯垂粉报春 fu chui fen bao chun

Primula fargesii Franchet.

Herbs perennial, forming dense mats of numerous rosettes. Petiole indistinct or to 1/2 as long as leaf blade; leaf blade elliptic to obovate-elliptic or oblanceolate, 1–3(–4) cm × 3–10 mm, abaxially densely yellow farinose, old leaves adaxially often bullate, base attenuate, margin sharply dentate above middle, apex obtuse to rounded. Scapes 2–5 cm, efarinose or farinose toward apex, 1- or 2(–5)-flowered; bracts linear to subulate, 1–5 mm, ± farinose. Flowers nodding. Pedicel 4–10 mm, yellow farinose. Calyx campanulate, 4–5(–6) mm, yellow farinose, parted below middle, 5-veined; lobes triangular to lanceolate, apex usually acute. Corolla pale violet or rose, 1.1–1.5 cm; cylindrical base of tube ca. 2 mm, gradually dilated above; limb campanulate, 1–1.5 cm wide; lobes erect, oblong, 4–5 mm, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style 8–9 mm, prominently exerted from short base. Thrum flowers unknown. Capsule shorter than calyx. Fl. May–Jun.

* Damp rock crevices; 1900–3000 m. N Guizhou, W Hubei, E Sichuan.

228. *Primula membranifolia* Franchet, Bull. Soc. Bot. France 33: 68. 1886.

薄叶粉报春 bao ye fen bao chun

Primula longituba Forrest.

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade, rarely nearly as long as leaf blade; leaf blade elliptic to obovate or subspatulate, 1.5–6 × 1–2.5 cm, membranous when dry, abaxially fugaciously yellow farinose, adaxially efarinose or scarcely farinose, base cuneate-attenuate, crenate-dentate, apex rounded. Scapes (1–)2–5 cm, yellow farinose; umbels 1–6(–9)-flowered; bracts linear to linear-lanceolate, 3–7 mm, farinose, whorled or sometimes spirally arranged and adnate to pedicel. Flowers heterostylous. Pedicel 2–10 mm, yellow farinose. Calyx campanulate, 3–4 mm, yellow farinose, parted to middle or below, obscurely 5-veined; lobes lanceolate, apex acute to acuminate. Corolla violet-rose; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube 9–10 mm; stamens 2–3 mm above base of corolla tube; style ca. 2/3 as long as tube. Thrum flowers with positions reciprocal. Capsule nearly as long as calyx. Fl. May.

* Damp limestone rocks; 3000–3300 m. W Yunnan.

229. *Primula socialis* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 295. 1990.

群居粉报春 qun ju fen bao chun

Herbs perennial, forming dense mats of many rosettes. Petiole very short to nearly as long as leaf blade; leaf blade obovate-elliptic to oblanceolate, 1–3 cm × 3–8 mm, membranous when dry, abaxially fugaciously pale-yellow farinose, adaxially glandular or scarcely farinose, base cuneate-attenuate, margin dentate above middle, apex obtuse to rounded. Scapes obsolete. Flowers solitary, heterostylous.

Pedicle 6–8 mm, yellow farinose; bract solitary, at base, linear, 3–4 mm. Calyx campanulate, 4–5 mm, yellow farinose, parted to middle or below, obscurely 5-veined; lobes narrowly triangular to lanceolate, apex acute. Corolla pale rose-purple; limb 1–1.8 cm wide; lobes obovate, 5–6 × ca. 4 mm, deeply emarginate. Pin flowers: corolla tube ca. 7 mm; stamens ca. 1.5 mm above base of corolla tube; style ca. 5 mm. Thrum flowers: corolla tube ca. 9 mm; stamens ca. 6 mm above base of corolla tube; style ca. 2 mm. Capsule unknown.

* Shaded rock crevices; ca. 3000 m. W Yunnan (Tengchong Xian).

230. *Primula kialensis* Franchet, J. Bot. (Morot) 9: 450. 1895.

等梗报春 deng geng bao chun

Herbs perennial, forming dense tufts with many rosettes. Petiole usually inconspicuous, occasionally nearly as long as leaf blade; leaf blade oblong-obovate to elliptic or subspatulate, 1.5–3.5 cm × 5–12 mm, abaxially densely yellow farinose, adaxially efarinose or scarcely farinose, base cuneate-attenuate, margin dentate-crenate to irregularly deep dentate, apex rounded to obtuse. Scapes 1–3.5(–4) cm, farinose toward apex; umbels (1 or) 2–6-flowered; bracts linear-lanceolate to linear, 3–8 mm, ± farinose. Flowers heterostylous. Pedicel 1–2.5 cm, ca. as long as to shorter than scape. Calyx campanulate to narrowly campanulate, 5–8 mm, sparingly yellow farinose outside, densely so inside, parted to middle or below, 5-veined; lobes lanceolate, apex acute to acuminate. Corolla rose or pale purple; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens near base of corolla tube; style ca. 2/3 as long as tube to exerted. Thrum flowers: stamens in upper 1/2 of corolla tube; style ca. 2 mm. Capsule elliptic, slightly shorter than calyx.

* Limestone rocks and cliffs; 1500–2500 m. NW and W Sichuan.

- 1a. Corolla tube 1–1.3 cm, 1.5–2 × as long as calyx 230a. subsp. *kialensis*
1b. Corolla tube 7–9 mm, only slightly longer than calyx 230b. subsp. *breviloba*

230a. *Primula kialensis* subsp. *kialensis*

等梗报春(原亚种) deng geng bao chun (yuan ya zhong)

Leaf blade crenate-dentate to dentate. Corolla tube 1–1.3 cm, 1.5–2 × as long as calyx. Fl. Apr–Jun.

* Limestone rocks and cliffs; 1500–2500 m. NW Sichuan.

230b. *Primula kialensis* subsp. *breviloba* C. M. Hu in Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 295. 1990.

短筒等梗报春 duan tong deng geng bao chun

Leaf blade deeply dentate on upper 1/2. Corolla tube 7–9 mm, slightly longer than calyx. Fl. Apr–May.

* Damp rocks and cliffs; 1700–2100 m. W Sichuan (E to Tianquan Xian).

231. *Primula yunnanensis* Franchet, Bull. Soc. Bot. France 32: 269. 1885.

云南报春 yun nan bao chun

Primula calcicola I. B. Balfour & Forrest; *P. fragilis* I. B. Balfour & Kingdon-Ward; *P. kichanensis* Franchet ex Petitmengin; *P. umbrellata* Forrest; *Pyunnanensis* subsp. *fragilis* (I. B. Balfour & Kingdon-Ward) W.W. Smith & Forrest.

Herbs perennial, forming small tufts with many rosettes. Petiole usually inconspicuous, rarely nearly as long as leaf blade; leaf blade elliptic to obovate-elliptic or spatulate, 0.5–3.5 cm × 2–7 mm, abaxially usually densely yellow farinose, adaxially efarinose or nearly so, base attenuate, margin crenulate to crenulate-dentate, apex obtuse to acute. Scapes 1.5–6(–8) cm, ± farinose toward apex, 1–5-flowered; bracts ovate-lanceolate to sublinear, 2–7 mm. Flowers heterostylous. Pedicel 1–10 mm, scarcely farinose. Calyx campanulate, (2–)4–5(–7) mm, efarinose or scarcely farinose outside, densely yellow farinose inside, parted to ± middle, 5-ribbed; lobes lanceolate to triangular, apex acute to subobtuse. Corolla rose-pink to lilac; tube 9–10 mm; limb 1–1.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule elliptic, usually shorter than calyx. Fl. Jun.

* Limestone rocks; 2800–3600 m. SW Sichuan, NW Yunnan.

232. *Primula maikhaensis* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 13. 1920.

怒江报春 nu jiang bao chun

Herbs perennial. Leaves in a rosette; petiole indistinct to 1/2 as long as leaf blade, narrowly winged; leaf blade elliptic to ovate-spatulate, 3–10 × 1–2.5(–3) cm, abaxially densely yellow farinose, base attenuate, margin obscurely crenate, apex rounded to obtuse. Scapes 3.5–8 cm, ± farinose toward apex; umbels 2- or 3-flowered; bracts ovate to ovate-lanceolate, 5–10 mm, leaflike. Flowers heterostylous. Pedicel 4–10 mm, farinose. Calyx campanulate, 6–8 mm, parted to ± middle, 5-veined; lobes oblong-lanceolate to lanceolate, scarcely farinose outside, densely yellow farinose inside, apex subobtuse. Corolla rose-purple; tube 1–1.2 cm; limb 1.5–2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near base of corolla tube; style reaching mouth. Thrum flowers: stamens toward apex of corolla tube; style ca. 1/2 as long as calyx. Capsule unknown.

* Rocky areas; 3000–3700 m. NW Yunnan.

233. *Primula conspersa* I. B. Balfour & Purdom in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 14. 1915.

散布报春 san bu bao chun

Primula gemmifera Batalin var. *licentii* (W.W. Smith & Forrest) W.W. Smith & H. R. Fletcher; *P. licentii* W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole ca. 1/2 as long as to nearly as long as leaf blade, narrowly winged; leaf blade elliptic, 1–5(–7) × 0.5–2(–3) cm, narrowly oblong to lanceolate, initially sparsely minutely glandular, glabrescent, base

attenuate, margin regularly crenate-denticulate, apex rounded to obtuse. Scapes 10–45 cm, glandular near apex; umbels 1 or 2, superimposed, (2–)5–15-flowered; bracts linear-lanceolate, 4–7 mm, base slightly gibbous. Flowers heterostylous. Pedicel 1–5 cm, glandular. Calyx campanulate, 3.5–5.5 mm, glandular outside, parted to middle; lobes narrowly triangular, glandular ciliolate. Corolla pale lilac to lavender-purple; tube 0.9–1.2 cm; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style slightly exerted. Thrum flowers: stamens just below annulus; style ca. as long as calyx. Capsule oblong, slightly longer than calyx. Fl. May–Jul.

* Wet meadows, woodland margins; 2700–3000 m. Gansu, N Henan (Linxian Xian), S Shaanxi, S Shanxi.

234. *Primula gemmifera* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 491. 1891.

苞芽报春 bao ya bao chun

Herbs perennial. Leaves in a rosette; petiole usually nearly as long as leaf blade, inconspicuous to $2 \times$ as long as leaf blade; leaf blade oblong to ovate or broadly spatulate, $1-7 \times 0.5-2$ cm, glabrous or sparsely minutely glandular abaxially, base attenuate, margin irregularly remote denticulate, apex obtuse to rounded. Scapes 8–30 cm, efarinose or white farinose toward apex; umbels 3–10-flowered; bracts often tinged with purple, narrowly lanceolate to oblong-lanceolate, 3–10 mm, scarcely farinose, base slightly gibbous. Flowers heterostylous. Pedicel 0.6–3.5 cm, minutely glandular. Calyx green or tinged with purple, narrowly campanulate, (5–)6–10 mm, glandular outside, white farinose inside and on margin, parted to middle; lobes lanceolate to triangular, glandular ciliolate. Corolla pink to purple, rarely white, annulate or exannulate; tube 0.8–1.3 cm; limb 1.5–2.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule elliptic, slightly longer than calyx.

* Wet meadows, woodland margins, streamsides; 2700–4300 m. S Gansu, W Sichuan, NE Xizang, NW Yunnan.

- 1a. Leaves thin textured; corolla annulate 234a. var. *gemmifera*
1b. Leaves subfleshy; corolla exannulate 234b. var. *amoena*

234a. *Primula gemmifera* var. *gemmifera*

苞芽报春(原变种) bao ya bao chun (yuan bian zhong)

Leaves thin textured. Corolla annulate. Fl. May–Aug.

* Wet meadows, woodland margins, streamsides; 2700–4300 m. S Gansu, W Sichuan, NE Xizang.

234b. *Primula gemmifera* var. *amoena* Chen, Bull. Fan Mem. Inst. Biol., Bot. 9: 285. 1940.

厚叶苞芽报春 hou ye bao ya bao chun

Primula carnosula I. B. Balfour & Forrest; *P. chrysopa* I. B. Balfour & Forrest; *P. gemmifera* var. *monantha* (W. W. Smith & Forrest) W. W. Smith & H. R. Fletcher; *P. gemmifera*

var. *rupestris* (Pax & K. Hoffmann) W. W. Smith & H. R. Fletcher; *P. gemmifera* var. *zambalensis* (Petitmengin) W. W. Smith & H. R. Fletcher; *P. monantha* W. W. Smith & Forrest; *P. rupestris* Pax & K. Hoffmann; *P. zambalensis* Petitmengin.

Leaves subfleshy. Corolla exannulate. Fl. May–Jul.

* Damp meadows, woodland margins, streamsides; 3000–4100 m. W Sichuan, NW Yunnan.

235. *Primula laciniata* Pax & K. Hoffmann, Repert. Spec. Nov. Regni Veg. 17: 98. 1920.

条裂叶报春 tiao lie ye bao chun

Herbs perennial. Leaves in a rosette; petiole ca. as long as to longer than leaf blade; leaf blade narrowly oblong to linear-lanceolate or spatulate, $3-8(-12) \times 0.5-1.5(-2)$ cm, glabrous or sparsely minutely glandular, base attenuate, margin pinnatifidly incised, apex obtuse to subrounded; lobules 1–3 mm wide, margin irregularly dentate. Scapes 12–25 cm, efarinose or farinose toward apex; umbels 1 or 2, superimposed, 5–12-flowered; bracts linear to linear-lanceolate, 4–8 mm, scarcely farinose. Flowers heterostylous. Pedicel 1–4 mm, \pm white farinose at apex. Calyx campanulate, 5–8 mm, parted to middle or below; lobes narrowly triangular, glandular or scarcely farinose outside, densely white farinose inside and on margin, apex acute to subobtuse. Corolla pinkish mauve; tube 1.1–1.4 cm; limb ca. 2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens 3–4 mm above base of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule oblong, 9–10 mm. Fl. Jun.

* Wet meadows, areas near water; 3900–4200 m. W Sichuan.

236. *Primula pumilio* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 498. 1881.

柔小粉报春 rou xiao fen bao chun

Primula pygmaeorum I. B. Balfour & W. W. Smith.

Herbs perennial, 1–3 cm tall. Leaves in a rosette; petiole membranously winged, ca. as long as to sometimes $2-3 \times$ as long as leaf blade; leaf blade elliptic to obovate-elliptic or subrhomboid, $3-15 \times 2-5$ mm, sparsely minutely glandular, base cuneate-attenuate, margin entire or obscurely remote denticulate, apex rounded to obtuse. Scapes very short at anthesis, elongated to 2 cm in fruit, 1–6-flowered; bracts ovate-elliptic to elliptic-lanceolate, 0.5–3 mm, sometimes slightly protuberant at base, apex rounded. Flowers heterostylous. Pedicel 2–4 mm. Calyx tubular, ca. 4 mm, parted to middle or above, 5-ribbed; lobes narrowly triangular, \pm glandular. Corolla pink; tube ca. as long as to slightly longer than calyx; limb 5–7 mm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule cylindrical, slightly longer than calyx. Fl. May–Jun.

Wet meadows; 4500–5300 m. S Gansu, Qinghai, Xizang [Bhutan].

237. *Primula oxygraphidifolia* W.W. Smith & Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 14: 50. 1923.

雅躑花叶报春 ya zhi hua ye bao chun

Herbs perennial, with old white spongelike leaves at base. Leaves in a rosette; petiole narrowly winged, nearly as long as to $2 \times$ as long as leaf blade; leaf blade broadly ovate to suborbicular or ovate-lanceolate, $4-10 \times 2.5-7$ mm, succulent, glabrous and efarinose, base rounded, truncate to broadly cuneate, margin entire or with few blunt teeth, apex rounded to obtuse. Scapes $2.5-5$ cm, 1-flowered; bracts 1 or 2, lanceolate, $1-2$ mm, adnate to \pm middle of scape, apex acute. Flower heterostylous. Calyx narrowly campanulate, $5-6$ mm, parted to middle; lobes oblong, apex obtuse. Corolla lavender-blue to purplish; tube $0.9-1.1$ cm; limb $2-2.5$ cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens ca. 1.5 mm above base of corolla tube; style slightly longer than calyx. Thrum flowers with positions reciprocal. Capsule unknown. Fl. Jun–Jul.

* Damp stony pastures, moss-covered rock crevices of limestone cliffs; $4000-5000$ m. SW Sichuan (Muli Xian).

238. *Primula urticifolia* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 497. 1881.

荨麻叶报春 qian ma ye bao chun

Herbs perennial. Leaves in a lax rosette; petiole $2-5 \times$ as long as leaf blade, narrowly winged; leaf blade suborbicular to broadly ovate, $3-7$ mm wide, efarinose but sparsely minutely glandular, base cuneate, pinnately $5-11$ -lobed, apex rounded; lobules linear-oblong, ca. 1 mm, apex obtuse. Scapes $2-7$ cm, $1-3$ -flowered; bracts subulate, $3-5$ mm. Flowers heterostylous. Pedicel $0.5-1.5$ cm, sparingly glandular. Calyx narrowly campanulate, $4-5$ mm, parted to middle, 5 -ribbed; lobes ovate to oblong, apex acute. Corolla rose-pink; tube ca. $2 \times$ as long as calyx; limb $1-1.5$ cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near base of corolla tube; style ca. as long as to slightly longer than calyx. Thrum flowers: stamens at middle of corolla tube; style ca. 2 mm. Capsule oblong, slightly shorter than calyx.

* Limestone rock crevices; ca. 4000 m. E Qinghai (Datong Xian, Xining Shi).

239. *Primula fasciculata* I. B. Balfour & Kingdon-Ward in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 16. 1915.

束花报春 shu hua bao chun

Primula reginella I. B. Balfour.

Herbs perennial, efarinose. Leaves in a rosette; petiole narrowly winged, $2-4 \times$ as long as leaf blade; leaf blade oblong to elliptic or suborbicular, $4-15 \times 2.5-7$ mm, base rounded to broadly cuneate, margin entire, apex rounded. Scapes to 2.5 cm; umbels $1-6$ -flowered; bracts linear, $8-10$ mm. Flowers heterostylous. Pedicel $1.5-3$ cm, sometimes to 10 cm when scape obsolete and flower solitary, without bracts. Calyx tubular, $4-6.5$ mm, parted to middle or below, distinctly 5 -veined; lobes narrowly oblong to triangular, apex

subobtusely. Corolla pink to rose; tube $4.5-8$ mm, slightly longer than calyx; limb $1-1.5$ cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule cylindrical, $5-10$ mm. Fl. May–Jun. $2n = 18^*$.

* Wet meadows, peatlands; $2900-4800$ m. Gansu, Qinghai, W Sichuan, NW Yunnan.

240. *Primula involucrata* Wallich ex Duby in A. de Candolle, Prodr. 8: 42. 1844.

花苞报春 hua bao bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole ca. as long as to $3 \times$ as long as leaf blade; leaf blade ovate to oblong or suborbicular, $1-3.5 \times 5-22$ cm, subfleshy, sparsely minutely glandular, base cuneate, rounded to slightly cordate, margin entire or remotely obscure denticulate, apex obtuse to rounded. Scapes $10-30$ cm; umbels $2-6$ -flowered; bracts oblong to ovate-lanceolate, $0.8-1.5$ cm \times $1.5-4$ mm, prolonged below into blunt auricles, $4-7$ mm. Flowers heterostylous. Pedicel $1-3.5$ cm, elongated to 8 cm in fruit. Calyx narrowly campanulate, $5-10$ mm, parted to $1/3$ or slightly below, 5 -ribbed; lobes lanceolate to triangular, glandular ciliolate, apex acute. Corolla white, pink, or purple; limb $1.5-2$ cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube $1-1.2$ cm; stamens ca. 4 mm above base of corolla tube; style slightly exerted. Thrum flowers: corolla tube $1.2-1.4$ cm; stamens toward apex of corolla tube; style slightly shorter than calyx. Capsule oblong, $1.25-1.5 \times$ as long as calyx. $2n = 22, 44$.

Wet meadows, marshes, glades; $3000-4500$ m. S Sichuan, Xizang, NW Yunnan [Bhutan, India, Kashmir, N Myanmar, Nepal, Sikkim].

- 1a. Corolla usually white, tube usually ca. $2 \times$ as long as calyx 240a. subsp. *involucrata*
- 1b. Corolla mauve to pink or purple, tube usually $2-5$ mm longer than calyx 240b. subsp. *yargongensis*

240a. *Primula involucrata* subsp. *involucrata*

花苞报春 (原亚种) hua bao bao chun (yuan ya zhong)

Primula munroi Lindley.

Corolla white, rarely tinged with purple; tube usually ca. $2 \times$ as long as calyx. Fl. Jun–Jul.

Wet meadows, marshes, glades; $3200-3800$ m. S Xizang [Bhutan, India, Kashmir, Nepal, Sikkim].

240b. *Primula involucrata* subsp. *yargongensis* (Petitmengin) W.W. Smith & Forrest, Notes Roy. Bot. Gard. Edinburgh 16: 24. 1928.

雅江报春 ya jiang bao chun

Primula yargongensis Petitmengin, Bull. Herb. Boissier, S. 2, 8: 367. 1908; *P. wardii* I. B. Balfour; *P. yargongensis* var. *liensis* Fang.

Corolla mauve to pink or purple, rarely white; tube usually 2–5 mm longer than calyx. Fl. Jun–Jul.

Wet meadows, marshes; 3000–4500 m. W Sichuan, E Xizang, N and NW Yunnan [Bhutan, N Myanmar].

241. *Primula nutans* Georgi, *Bemerk. Reise Russ. Reich* 1: 200. 1775.

天山报春 *tian shan bao chun*

Primula sibirica Jacquin.

Herbs perennial, efarinose. Leaves in a rosette; petiole nearly as long as leaf blade, occasionally 1–3 × as long as leaf blade; leaf blade ovate to oblong or suborbicular, 0.5–2.5(–3) × 0.4–1.5 cm, base rounded to cuneate, margin entire to obscurely denticulate, apex obtuse. Scapes (2–)10–25 cm, glabrous; umbels 2–6(–10)-flowered; bracts oblong, 5–8 mm, glandular ciliolate, prolonged below into blunt auricles 1–1.5 mm, apex obtuse to apiculate. Flowers heterostylous. Pedicel 5–22(–45) cm. Calyx tubular-campanulate, 5–8 mm, often brownish punctate, slightly constricted at base, parted to 1/3, 5-ribbed; lobes oblong to triangular, densely glandular ciliolate, apex acute to obtuse. Corolla pinkish purple; tube 6–10 mm; limb 1–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style exserted. Thrum flowers: stamens toward apex of corolla tube; style slightly exceeding middle of tube. Capsule cylindrical, 7–8 mm. Fl. May–Jun. $2n = 20, 22, 32, 34$.

Wet meadows, marshes; 600–3800 m. Gansu, Nei Mongol, Qinghai, N Sichuan, Xinjiang [Kazakhstan, N Mongolia, Pakistan, Russia; N Europe, NW North America].

242. *Primula tibetica* Watt, *J. Linn. Soc., Bot.* 20: 6. 1882.

西藏报春 *xi zang bao chun*

Primula tanupoda I. B. Balfour & W.W. Smith.

Herbs perennial. Leaves in a rosette; petiole nearly as long as to 3 × as long as leaf blade; leaf blade ovate to elliptic or spatulate, 0.6–3 cm × 2–16 mm, glabrous, base cuneate to subrounded, margin usually entire, apex obtuse to rounded. Scapes variable, sometimes hidden among leaves, shorter than pedicel to 13 cm and longer than leaves and pedicel; umbels (1 or)2–10-flowered; bracts narrowly oblong to lanceolate, 4–10 mm, prolonged below into blunt auricles 1–1.5 mm, apex obtuse to acute. Flowers heterostylous. Pedicel 2–8 cm. Calyx tubular-campanulate, 3–5 mm, parted to middle or above, distinctly 5-ribbed; lobes lanceolate to subtriangular, margin glabrous, apex acute. Corolla pinkish purple or lilac; tube 4.5–7 mm, slightly longer than calyx; limb 7–10 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style exserted. Thrum flowers with positions reciprocal. Capsule cylindrical, slightly longer than calyx. $2n = 20$.

Wet meadows, marshes; 3200–4800 m. Xizang [Bhutan, India, Nepal, Sikkim].

243. *Primula subularia* W. W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 19: 204. 1937.

线叶小报春 *xian ye xiao bao chun*

Herbs perennial, efarinose, forming dense mats of leaf rosettes. Leaf blade sessile or nearly so, linear to subulate, 6–10 × ca. 1 mm, base scarcely narrower, margin entire, apex acute. Flowers solitary, erect, homostylous. Pedicel hidden in leaves, less than 3 mm. Calyx green, narrowly cupular, ca. 3.5 mm, parted slightly below middle; lobes narrowly oblong to subligulate, apex rounded to obtuse. Corolla rose-purple; tube ca. 8 mm, sparsely pubescent inside; limb ca. 8 mm wide; lobes narrowly obovate, ca. 4 mm, abaxially puberulent, deeply emarginate. Stamens ca. 2 mm above base of corolla tube. Style ca. 2 mm, scarcely reaching level of calyx. Capsule narrowly cylindrical. Fl. Jul.

* Damp mossy rocks; 4500–4800 m. SE Xizang.

244. *Primula praetermissa* W.W. Smith, *Trans. Bot. Soc. Edinburgh* 33: 117. 1941.

匙叶小报春 *chi ye xiao bao chun*

Herbs perennial, efarinose, less than 1.5 cm tall. Rosettes 1.5 cm in diam., with remains of old leaves at base. Petiole narrowly winged, nearly as long as leaf blade; leaf blade spatulate to oblanceolate, 5–12 × 1–2 mm, tapered to base, glabrous or occasionally sparsely minutely glandular abaxially, margin entire or occasionally with 1–3 small teeth on each side, apex obtuse. Scapes less than 3 mm, 1-flowered; bracts solitary, linear, ca. 0.5 mm, inserted 1–2 mm below calyx. Flowers terminal, homostylous. Calyx campanulate, 2–2.5 mm, glabrous, parted to near middle; lobes triangular, apex acute to obtuse. Corolla bluish purple; tube ca. 5 mm; limb 4–5 mm wide; lobes oblong, ca. 2 × 1 mm, emarginate. Stamens at middle of corolla tube. Style ca. 2.5 mm. Capsule cylindrical, to 5.5 mm.

* Damp meadows; ca. 4000 m. SE Xizang (Mainling Xian).

245. *Primula muscoides* J. D. Hooker ex Watt, *J. Linn. Soc., Bot.* 20: 15. 1882.

苔状小报春 *tai zhuang xiao bao chun*

Herbs perennial, forming dense small tufts. Rosettes 1–1.5 cm in diam. Leaves sessile, oblong-cuneate to obovate, 5–10 × 1.5–5 mm, slightly narrowed to base, subleathery, glabrous, efarinose, apex subtruncate, with 3–7 sharp teeth. Scapes absent at anthesis, elongated to 8–10 mm in fruit, with a solitary flower. Flower homostylous. Pedicel less than 1 mm, yellow farinose; bracts 2, ± clasping, ovate, 1.5–2 mm. Calyx cupular, ca. 2 mm, parted slightly below middle; lobes triangular, densely yellow farinose inside and on margin. Corolla rose-purple or pale violet; tube white or nearly so, ca. 5 mm, densely white pubescent around mouth; limb ca. 5 mm wide; lobes suberect, narrowly oblong, deeply emarginate. Stamens just below middle of corolla tube. Style reaching anthers. Capsule subglobose, ca. 3 mm in diam. $2n = 18$.

Moss on gravelly slopes; 4600–5300 m. SE Xizang [Bhutan, NE India, Nepal, Sikkim].

246. *Primula waddellii* I. B. Balfour & W.W. Smith in I. B. Balfour, *Notes Roy. Bot. Gard. Edinburgh* 9: 56. 1915.

窄筒小报春 zhai tong xiao bao chun

Herbs perennial, forming small mats less than 1 cm tall, with remains of old leaves at base. Petiole indistinct to 1/2 as long as leaf blade; leaf blade spatulate, 4–10 × 2–5 mm, minutely glandular, base attenuate, margin crenulate or denticulate on upper 1/2 or toward apex, apex rounded. Scapes 1.5–4(–10) mm, glandular, 1-flowered; bracts 1 or 2, linear, ca. 1.5 mm, sparsely glandular ciliolate, apex acute. Flower subsessile, heterostylous. Calyx cupular, 3.5–4.5 mm, parted to middle or below; lobes oblong to oblong-lanceolate, sparsely minutely glandular. Corolla purplish blue or pinkish; tube 7–10(–12) mm, white tomentose inside; limb 1–1.5 cm wide; lobes narrowly obovate, deeply emarginate; lobules linear, 2.5–3 mm, apex obtuse. Pin flowers: stamens near base of corolla tube; style reaching middle of tube. Thrum flowers with positions reciprocal. Capsule ovoid, slightly shorter than calyx. Fl. Jun.

Peat, among rocks; 4000–5000 m. S Xizang [Bhutan].

247. *Primula tenuiloba* (Watt) Pax, Bot. Jahrb. Syst. 10: 204. 1888.

细裂小报春 xi lie xiao bao chun

Primula muscoides J. D. Hooker ex Watt var. *tenuiloba* Watt, J. Linn. Soc., Bot. 20: 15. 1882; *P. indobella* I. B. Balfour & W.W. Smith.

Herbs perennial, efarinose, to 2 cm tall, with remains of old leaves at base. Petiole narrowly winged, shorter than to slightly longer than leaf blade; leaf blade spatulate, 0.5–2 cm × 2–4 mm, base attenuate, margin deeply blunt lobulate-dentate, with oblong teeth, often revolute, apex obtuse to rounded. Scapes rarely to 2 cm, 1-flowered; bracts 1, adnate just below calyx, linear, to 4 mm. Flower subsessile, heterostylous. Calyx narrowly campanulate, 3.5–5 mm, parted to middle; lobes green or tinged purple, oblong to elliptic, apex obtuse or dentate. Corolla bright bluish violet, with a white eye; tube 6–8 mm, white pubescent outside; limb 1.5–2 cm wide; lobes narrowly obovate, deeply 2-lobed; lobules linear, ca. 3.5 × 1.5 mm. Pin flowers: stamens near base of corolla tube; style reaching middle of tube. Thrum flowers with positions reciprocal. Capsule cylindrical, shorter than calyx. Fl. Jul.

Rocky hillsides, moss-covered boulders; 4200–5400 m. S and SE Xizang [Bhutan, NE India, Nepal, Sikkim].

248. *Primula annulata* I. B. Balfour & Kingdon-Ward in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 6. 1915.

单花小报春 dan hua xiao bao chun

Herbs perennial, efarinose. Rhizomes terminated in 1 or 2 leaf rosettes; leaf rosettes 1–1.5 cm in diam, with remains of old leaves at base. Petiole winged, nearly as long as leaf blade; leaf blade obovate-spatulate to oblong-spatulate, 0.7–1.5 cm × 3–5 mm, minutely short-stalked glandular, slightly scabrous, base attenuate, margin regularly serrate to serrate-lobulate, apex rounded to obtuse. Scapes 1–4 cm, densely glandular, 1-flowered; bracts 2, subulate or narrowly lanceolate, 1.5–2.5 mm. Flowers terminal, homostylous. Pedicel ca. 2 mm,

elongated to 4 mm in fruit, densely glandular. Calyx campanulate, 3.5–4 mm, densely glandular outside, parted to near middle; lobes oblong, margin sometimes slightly dentate, apex obtuse or acute. Corolla violet or rose-pink; tube ca. 5 mm, puberulent inside; limb ca. 8 mm wide; lobes obovate-cuneate, deeply emarginate. Stamens near middle of corolla tube. Style reaching anthers. Capsule cylindrical, nearly as long as calyx. Fl. Jul.

* Limestone cliffs; ca. 4700 m. NW Yunnan (D隄陟 Xian, Zhongdian Xian).

249. *Primula rubicunda* H. R. Fletcher in W.W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 35: 192. 1950.

深红小报春 shen hong xiao bao chun

Herbs perennial, efarinose, forming small mats, 1.5–2 cm tall. Petiole nearly as long as leaf blade; leaf blade obovate to spatulate, 0.7–1.5 cm × 3–5 mm, slightly scabrous from minute short-stalked glands, base attenuate, margin crenate-dentate to dentate, apex rounded. Scapes 1–2 cm, sparsely minutely glandular, 1-flowered; bracts 2, linear, 1–2 mm. Flower heterostylous. Pedicel 2–3 mm. Calyx green, campanulate, 3–4 mm, densely minutely glandular, parted nearly to middle; lobes ovate to lanceolate, apex acute to obtuse. Corolla rose; tube 6–8 mm; limb ca. 1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 1.5 mm above base of corolla tube; style reaching annulus. Thrum flowers with positions reciprocal. Capsule cylindrical, slightly longer than calyx. Fl. Jun.

* Shallow soil, rock faces; ca. 4800 m. SE Xizang (Nyingchi Xian).

250. *Primula walshii* Craib, J. Roy. Hort. Soc. 39: 190. 1913.

腺毛小报春 xian mao xiao bao chun

Primula hsiungiana Fang; *P. petrocharis* Pax & K. Hoffmann.

Herbs perennial, efarinose, to 2 cm tall, with remains of leaves at base. Petiole winged, usually 2–3 mm; leaf blade oblanceolate to oblong-lanceolate, 0.8–1.5 cm × 2–5 mm, short glandular pubescent, appearing scabrous, base cuneate, margin entire, apex acute to obtuse. Scapes initially inconspicuous, hidden in leaves, elongated to 3 cm in fruit, 1–4-flowered; bracts ovate to lanceolate, 1.5–3 mm, minutely glandular pubescent, apex acuminate. Flowers heterostylous. Pedicel nearly as long as bracts. Calyx tubular, 3.5–5 mm, short glandular pubescent, parted to middle or above; lobes often slightly reflexed, ovate to lanceolate, apex acute to obtuse. Corolla pink or pale bluish purple; tube 5–6 mm; limb 5–8 mm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens slightly below middle of corolla tube; style ca. 2/3 as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, slightly longer than calyx. Fl. Jun–Jul.

Steep grassy slopes, near water; 3800–5400 m. NW and W Sichuan, SE Xizang [Bhutan, NE India, Nepal].

251. *Primula tenella* King ex J. D. Hooker, Fl. Brit. India 3: 492. 1882.

匍茎小报春 pu jing xiao bao chun

Herbs perennial, with old remains of leaves at base, occasionally with short leafy stolons. Leaves in a rosette; petiole usually nearly as long as leaf blade, sometimes indistinct to 3 × as long as leaf blade; leaf blade rhomboid to ovate-spatulate, 0.6–1.5 cm × 5–8 mm, abaxially copiously white farinose, adaxially densely glandular and sparingly white farinose, base long cuneate-attenuate, margin usually denticulate or crenulate above middle, apex subrounded, rarely acute. Scapes 2–5 cm, scarcely farinose, 1(or 2)-flowered; bracts solitary, linear to subulate, 2–3 mm, inserted slightly below calyx. Flowers subsessile, heterostylous. Calyx narrowly campanulate, 4–8 mm, glandular outside, copiously white farinose inside, parted to middle or slightly below, 5-veined; lobes lanceolate, apex acute to subobtusate. Corolla blue-violet; tube 1–1.4 cm; limb 1.5–2.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style reaching mouth. Thrum flowers: stamens at middle of corolla tube; style ca. 3 mm. Capsule subglobose, shorter than calyx. Fl. Sep. $2n = 22^*$.

Rock crevices; 4700–5000 m. S Xizang [Bhutan].

252. *Primula rimicola* W. W. Smith, Trans. Bot. Soc. Edinburgh 33: 118. 1941.

岩生小报春 yan sheng xiao bao chun

Herbs perennial, to 3 cm tall, with remains of old leaves at base. Petiole membranously winged, shorter than to occasionally ca. as long as leaf blade; leaf blade oblanceolate to spatulate, 1.2–3 cm × 5–7 mm, abaxially copiously yellow farinose, adaxially efarinose to scarcely farinose, base attenuate, margin ± irregularly sharp denticulate, apex subrounded. Scapes very short at anthesis, elongated to 2–2.5 cm in fruit, yellow farinose, with a solitary flower; bracts 2 or 3, lanceolate to linear-lanceolate, 2–5 mm, farinose. Flower heterostylous. Pedicel 2–3 mm. Calyx cupular, 6–7 mm, membranous, sparsely yellow farinose outside, densely so inside, parted below middle; lobes lanceolate, glandular ciliate, apex acute. Corolla purplish pink; tube 1.1–1.2 cm; limb ca. 1.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. 7 mm, slightly longer than calyx. Capsule unknown.

* Sheltered crevices of cliffs; ca. 5000 m. S Xizang (M₁₂og Xian).

253. *Primula candicans* W.W. Smith in W.W. Smith & H. R. Fletcher, Trans. Bot. Soc. Edinburgh 35: 190. 1950.

亮白小报春 liang bai xiao bao chun

Herbs perennial, forming cushions of many leaf rosettes. Petiole narrowly winged, nearly as long as leaf blade; leaf blade obovate to oblanceolate or spatulate, 2–3 × 0.5–1.5 cm, abaxially densely yellow farinose, adaxially sparsely yellow farinose, base attenuate, margin denticulate on upper 1/2, apex rounded or acute. Scapes to 1 cm, farinose, 1–4-flowered; bracts linear to linear-lanceolate, 5–7 mm, farinose. Flowers heterostylous. Pedicel 5–10 mm, elongated slightly in fruit.

Calyx narrowly campanulate to tubular, 6.5–7 mm, sparsely farinose outside, parted to below middle; lobes lanceolate, apex acute. Corolla bluish purple, sparsely farinose outside; tube 1.3–1.4 cm; limb 1–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 7 mm above base of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule slightly shorter than calyx. Fl. May.

* Rocks; 4100–4200 m. SE Xizang (Bomi Xian).

254. *Primula minutissima* Jacquemont ex Duby in A. de Candolle, Prodr. 8: 42. 1844.

高峰小报春 gao feng xiao bao chun

Primula heydei Watt.

Herbs perennial, forming dense tufts of numerous rosettes, occasionally with short leafy stolons. Petiole indistinct or occasionally nearly as long as leaf blade; leaf blade narrowly oblong to lanceolate or oblanceolate, 5–10 × 1.5–3 mm, abaxially densely yellow farinose, adaxially sparsely glandular, base attenuate, margin denticulate above middle, apex acute to acuminate. Scapes initially inconspicuous, hidden in leaves, to 2.5–4.5(–6) cm in fruit, 1–3(–8)-flowered; bracts 2 or 3, lanceolate, to 3 mm, apex acute. Flowers sessile, heterostylous. Calyx tubular to tubular-campanulate, 3–4 mm, farinose, parted slightly below middle; lobes lanceolate, apex acute. Corolla dark reddish purple, exannulate; tube 7–9 mm; limb 5–10 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style slightly exceeding middle of tube. Thrum flowers with positions reciprocal. Capsule cylindrical, nearly as long as calyx. Fl. Jun.

Damp meadows; 3700–5200 m. W Xizang (Ngari Xian) [India, Nepal, Pakistan].

Smith and Fletcher (Trans. & Proc. Bot. Soc. Edinburgh 33: 238. 1942) cited all flowering specimens as *Primula minutissima* and all fruiting ones as *P. heydei*. There is no doubt that they are the same species in different stages of development.

255. *Primula primulina* (Sprengel) H. Hara, J. Jap. Bot. 37: 99. 1962.

球毛小报春 qiu mao xiao bao chun

Androsace primulina Sprengel, Syst. Veg. 4(2): 57. 1827; *A. primuloides* D. Don; *Primula pusilla* Wallich; *P. pusilla* var. *flabellata* W.W. Smith.

Herbs perennial, with remains of old leaves at base. Petiole narrowly winged, usually shorter than leaf blade, occasionally longer; leaf blade spatulate to oblanceolate, 1–3 cm × 3–5 mm, abaxially minutely glandular, short pubescent along midvein, adaxially scabrous, short glandular pubescent, base attenuate, margin deeply pinnatifid-dentate with sublinear teeth, apex rounded. Scapes 2–9 cm, sparsely glandular; umbels 2–4-flowered; bracts ovate to linear-lanceolate, 3–4 mm. Flowers subsessile, heterostylous. Calyx campanulate, 3–4 mm, minutely short-stalked glandular outside, parted to middle; lobes triangular to oblong, usually white farinose inside, apex acute to obtuse. Corolla purple or blue-purple,

rarely white; tube ca. as long as to slightly longer than calyx, pubescent outside, with a tuft of white hairs obscuring throat; limb 8–10 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens near base of corolla tube; style reaching mouth. Thrum flowers with positions reciprocal. Capsule cylindrical, ca. as long as calyx. Fl. Jul. 2n = 18.

Moist meadows, among *Rhododendron*; 4000–5000 m. S Xizang (Moindawang Xian, Nyalam Xian) [Bhutan, NE India, Nepal, Sikkim].

256. *Primula oclusa* W.W. Smith, Trans. Bot. Soc. Edinburgh 33: 263. 1942.

扇叶小报春 shan ye xiao bao chun

Herbs perennial. Leaves in rosettes, 1.5–2.5 cm in diam. Petiole narrowly winged, usually shorter than leaf blade; leaf blade flabelliform to suborbicular, 0.6–1.5 cm × 2–7 mm, abaxially pubescent along veins, usually efarinose, adaxially scabrous-pubescent, base short attenuate, margin dentate in upper 1/2, apex rounded. Scapes 3.5–5 cm, densely minutely glandular and scarcely farinose toward apex, 1- or 2(or 3)-flowered; bracts 2 or 3, broadly ovate, 3–3.5 mm, often deeply dentate at apex. Flowers sessile, heterostylous. Calyx campanulate, 4–4.5 mm, glandular outside, parted to middle; lobes ovate to oblong, apex rounded to apiculate. Corolla purplish mauve, violet, or purple, with a white eye; tube 7–8 mm; throat obscured by a projecting tuft of white hairs; limb 7–10 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens slightly below middle of corolla tube; style scarcely as long as tube. Thrum flowers with positions reciprocal. Capsule cylindrical, ca. as long as calyx. Fl. Jul.

* Banks, hillsides, grassy cliff edges; ca. 5000 m. SE Xizang.

257. *Primula barbatula* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 201. 1937.

紫球毛小报春 zi qiu mao xiao bao chun

Herbs perennial, efarinose, glabrous. Rosettes 1.2–2 cm in diam., with remains of withered leaves at base, often with 3–5 mm stolons. Petiole narrowly winged, usually 2–3 × as long as leaf blade; leaf blade spatulate, 4–8 × 1–4 mm, ± succulent, base cuneate-attenuate, upper 1/2 deeply incised into 3–7 narrowly triangular, ± blunt teeth, apex rounded. Scapes 4–15 mm, 1-flowered; bracts 1, linear. Flower heterostylous. Pedicel 1–2 mm. Calyx cupular, 2.5–3 mm, parted to ± middle; lobes lanceolate, apex acute. Corolla pinkish purple to blue-violet; tube 3.5–4 mm; throat obscured by a projecting tuft of purple hairs; limb 6–9 mm wide; lobes obovate, deeply emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1 mm. Capsule cylindrical, ca. as long as calyx. Fl. Jul.

* Open stony hillsides, cliff edges; ca. 5000 m. SE Xizang (M#og Xian).

258. *Primula bella* Franchet, Bull. Soc. Bot. France 32: 268. 1885.

山丽报春 shan li bao chun

Primula bella subsp. *bonatiana* (Petitmengin) W.W. Smith & Forrest; *P. bella* subsp. *cyclostegia* (Handel-Mazzetti) W.W. Smith & Forrest; *P. bella* subsp. *nanobella* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. bonatiana* Petitmengin; *P. cyclostegia* Handel-Mazzetti; *P. nanobella* I. B. Balfour & Forrest; *P. stragulata* I. B. Balfour & Forrest.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, nearly as long as to slightly longer than leaf blade; leaf blade obovate to suborbicular or spatulate, 3–7 × 3–5 mm, glabrous, abaxially ± yellow farinose, rarely whitish farinose or nearly efarinose, base attenuate, deeply incised into lanceolate to ovate teeth which are often recurved at apex, apex rounded. Scapes 0.7–5.5 cm, glandular pubescent, 1- or 2(or 3)-flowered; bracts 2, opposite or occasionally alternate, lanceolate to ovate or suborbicular, 2–5 mm. Flowers heterostylous. Pedicel inconspicuous or to 1.5 mm, glandular puberulent. Calyx tubular-campanulate, 4–6 mm, sparsely glandular, parted to middle or slightly below; lobes deltoid-ovate to subquadrate, apex acute to acuminate, occasionally obtuse and apiculate or 3-toothed. Corolla rose, purple, or violet; tube slightly longer than to sometimes nearly 2 × as long as calyx, pubescent inside, with a projecting tuft of hairs in throat; limb 2–2.5 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: stamens near base of corolla tube; style reaching throat. Thrum flowers with positions reciprocal. Capsule ellipsoid, slightly shorter than calyx. Fl. Jul–Aug.

* Among boulders on mountain slopes; 3700–4800 m. SW Sichuan, SE Xizang, NW Yunnan.

259. *Primula moschophora* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 186. 1916.

麝香美报春 she xiang mei bao chun

Primula bella subsp. *moschophora* (I. B. Balfour & Forrest) W.W. Smith & Forrest.

Herbs perennial. Stolons 1.5–3(–7) cm. Leaves in a rosette; petiole narrowly winged, usually ca. as long as leaf blade; leaf blade elliptic to obovate, sometimes subrhomboid or narrowly spatulate, 5–8 × ca. 4 mm, abaxially densely white farinose, adaxially sparsely minutely glandular, base attenuate, margin deeply dentate, apex obtuse to rounded. Scapes 1–1.8 cm, sparsely glandular, 1(–3)-flowered; bracts 2, unequal, linear to linear-lanceolate, to ca. 3 mm. Flowers heterostylous. Pedicel ca. 1 mm. Calyx campanulate, 5–6 mm, ± farinose, parted to middle, conspicuously 5-veined; lobes triangular to oblong triangular, apex acute. Corolla purplish rose; tube 7.5–11 mm, with a tuft of hairs at throat; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens 2–2.5 mm above base of corolla tube; style reaching mouth. Thrum flowers: stamens toward apex of corolla tube; style ca. 5 mm. Capsule cylindrical, slightly shorter than calyx. Fl. Jul–Aug.

Moist stony pastures; ca. 3700 m. W Yunnan (Lushui Xian, Pianma Xian, Tengchong Xian) [N Myanmar].

260. *Primula homogama* Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 295. 1990.

娥眉缺裂报春 e mei que lie bao chun

Herbs perennial, 1–2 cm tall. Leaves in a rosette; petiole nearly as long as to shorter than leaf blade; leaf blade broadly ovate to oblong, 4–13 × 3.5–10 mm, minutely scurfy pubescent, abaxially yellow farinose, base subrounded to truncate, rarely short attenuate, margin irregularly dentate, apex obtuse to rounded. Scapes 1–3 cm, glandular puberulent, 1- or 2-flowered; bracts linear to oblong, (1–)2–4 mm, farinose, apex acute. Flowers homostylous. Pedicel 4–12 mm, glandular puberulent. Calyx campanulate, 3.5–4.5 mm, glandular puberulent outside, yellow farinose inside, parted slightly below middle, obscurely 5-ribbed; lobes lanceolate to triangular, apex acute. Corolla pink or violet; tube 6–7 mm; limb 8–10 mm wide; lobes obovate-cuneate, 3–5 mm, deeply emarginate. Stamens near apex of corolla tube. Style reaching anthers. Capsule cylindrical, ca. as long as calyx. Fl. Jun–Jul.

* Cliffs; 2400–3000 m. Sichuan (Emei Shan).

261. *Primula humilis* Pax & K. Hoffmann, Repert. Spec. Nov. Regni Veg. 17: 94. 1921.

矮葶缺裂报春 ai ting que lie bao chun

Primula souliei Franchet subsp. *humilis* (Pax & K. Hoffmann) W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 2–3 × as long as leaf blade, puberulent; leaf blade broadly ovate to sub-orbicular, 0.7–1.5 × 0.7–1.2 cm, abaxially white or pale yellow farinose, adaxially scabrous, minutely appressed pubescent, base truncate to shallowly cordate, margin irregularly incised-dentate to serrate, apex acute to obtuse. Scapes 1.5–5 cm, puberulent; umbels 1–5-flowered; bracts narrowly lanceolate to subulate, 3–10 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, puberulent. Calyx campanulate to tubular-campanulate, 6–10 mm, puberulent outside, densely farinose inside, parted to below middle, 5-veined; lobes lanceolate to oblong-lanceolate, apex acute. Corolla rose-blue; tube 1.1–1.2 cm; limb 1.5–2 cm wide; lobes obovate-oblong to oblong, 6–8 × 5–6 mm, margin entire, apex rounded. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. Jun.

* Granite rocks, meadows; 4000–4800 m. W Sichuan (Dawu Xian, Xinlong Xian).

262. *Primula aliciae* G. Taylor ex W.W. Smith, J. Linn. Soc., Bot. 52: 336. 1942.

西藏缺裂报春 xi zang que lie bao chun

Herbs perennial. Leaves in a rosette; petiole short, winged; leaf blade obovate to spatulate, 2–4 × 0.5–1.5 cm, tapered to base, abaxially minutely glandular or pale yellow farinose, pubescent along veins, adaxially scabrous-puberulent, margin irregularly sharp dentate, apex rounded. Scapes 6–18 cm, scarcely farinose toward apex; umbels subcapitate, 2–6-flowered; bracts narrowly lanceolate to oblanceolate or sublinear, 5–12 mm, sparsely farinose. Flowers heterostylous. Pedicel 1–5

mm, ± yellow farinose. Calyx campanulate, 7–9 mm, yellow farinose, parted to middle or slightly below; lobes ovate to ovate-oblong, margin often dentate, apex rounded to obtuse. Corolla lavender to violet-blue with a rose-purple tube; limb ca. 2 cm wide; lobes broadly obovate, deeply emarginate. Pin flowers: corolla tube 9–10 mm; stamens ca. 3.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, 7–8 mm. Fl. Jul.

* Stony grassy slopes; ca. 4800 m. SE Xizang (Mainling Xian).

263. *Primula rupicola* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 41. 1915.

黄粉缺裂报春 huang fen que lie bao chun

Primula rupicola var. *albicolor* W. W. Smith & H. R. Fletcher.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, usually nearly as long as leaf blade; leaf blade oblanceolate to obovate or spatulate, 1–10 × 0.5–2 cm, abaxially pale yellow or white farinose, or nearly efarinose, adaxially scabrous-pubescent, base attenuate, margin irregularly dentate, apex rounded to obtuse. Scapes 2–12 cm, ± puberulent, farinose toward apex; umbels lax, 2–8-flowered; bracts linear-lanceolate, puberulent. Flowers heterostylous. Pedicel 0.3–2.5 cm, yellow farinose and puberulent. Calyx campanulate to tubular-campanulate, 6–10 mm, puberulent outside, yellow farinose inside, parted to middle, distinctly 5-veined; lobes lanceolate to narrowly oblong, margin occasionally dentate, apex acute to obtuse. Corolla rose to pale violet; tube 1.1–1.4 cm; limb 1.5–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 3.5 mm above base of corolla tube; style ca. 2/3 as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, nearly as long as calyx. Fl. Jun–Jul. $2n = 16^*$.

* Stony pastures, rock crevices; 3600–4000 m. W Sichuan, NW Yunnan.

264. *Primula souliei* Franchet, J. Bot. (Morot) 9: 450. 1895.

缺裂报春 que lie bao chun

Primula legendrei Bonati; *P. parvula* Pax & K. Hoffmann; *P. souliei* subsp. *legendrei* (Bonati) W. W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1–3 × as long as leaf blade; leaf blade ovate to broadly ovate, 1–2 × 0.5–1.5 cm, abaxially pale yellow farinose or efarinose, adaxially short scurfy pubescent, appearing scabrous, base truncate to obscurely cordate, margin irregularly crenate-dentate, apex obtuse to rounded. Scapes 4–12 cm, sparsely pubescent; umbels (1 or) 2–8-flowered; bracts subulate to linear-lanceolate, 5–9 mm. Flowers heterostylous. Pedicel 0.5–1.5 cm, puberulent, sometimes farinose. Calyx often tinged with purple, tubular-campanulate, 5–8 mm, efarinose or scarcely farinose, parted to middle or above, obscurely 5-ribbed; lobes linear-lanceolate to lanceolate, apex acute to obtuse. Corolla bluish purple; tube 0.9–1.1 cm; limb 1–1.8 cm wide; lobes obovate-cuneate, deeply emarginate. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers: stamens slightly above middle

of corolla tube; style ca. 1 mm. Capsule ovate, shorter than calyx. Fl. Jul.

* Rock crevices; ca. 4000 m. W Sichuan.

265. *Primula blinii* H. L. 関eill, Monde Pl. 17: 2. 1915.

糙毛报春 cao mao bao chun

Primula asperulata N. P. Balakrishnan; *P. florida* I. B. Balfour & Forrest; *P. incisa* Franchet; *P. incisa* subsp. *pectinata* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. longipinnatifida* Chen; *P. oesbia* I. B. Balfour; *P. pectinata* I. B. Balfour & Forrest; *P. souliei* Franchet subsp. *florida* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. souliei* subsp. *oesbia* (I. B. Balfour) W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1–3 × as long as leaf blade; leaf blade broadly ovate to oblong, 0.7–3.5 × 0.5–2.5 cm, abaxially white, rarely yellow farinose or efarinose, adaxially scabrous-puberulent, base short cuneate-attenuate to truncate or cordate, margin incised-dentate to pinnatifid, apex rounded to obtuse; lobules linear to oblong, margin entire or with 1 or 2 teeth. Scapes 4–25 cm, puberulent; umbels 2–8(–10)-flowered; bracts lanceolate to linear-lanceolate, 4–8 × 1–2 mm, apex acute to obtuse. Flowers heterostylous. Pedicel 2–11 mm, ± farinose. Calyx campanulate to tubular-campanulate, 4–6.5 mm, white or pale yellow farinose, parted below middle, 5-ribbed; lobes lanceolate, apex acute to obtuse. Corolla purplish rose to bluish purple, rarely white; limb 1–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: corolla tube 8–10 mm; stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule oblong, shorter than calyx. Fl. Jun–Jul.

* South-facing grassy slopes, woodland margins, alpine *Quercus* forests; 3000–4500 m. W Sichuan, N and NW Yunnan.

266. *Primula dryadifolia* Franchet, Bull. Soc. Bot. France 32: 270. 1885.

石岩报春 shi yan bao chun

Herbs perennial, evergreen, forming dense cushions. Rhizomes woody, conspicuous, much branched. Leaves evergreen; petiole 1–3 × as long as leaf blade, broadly winged, sheathing toward base; leaf blade broadly ovate to broadly elliptic or suborbicular, 3–20 × 3–13 mm, leathery, abaxially densely yellow or white farinose, adaxially sparsely short glandular pubescent or subglabrous, base truncate to cordulate, rarely broadly cuneate, margin crenulate, usually narrowly revolute, apex rounded to obtuse. Scapes 0.4–10 cm, pubescent, 1–5-flowered; bracts often tinged with purple, broadly ovate to elliptic, 5–12 × 3–7 mm, apex obtuse to dentate. Flowers heterostylous. Pedicel nearly obsolete to 2 mm. Calyx broadly campanulate, 5–8(–10) mm, pubescent, farinose at base, parted to middle; lobes ovate to oblong-ovate, apex rounded to obtuse. Corolla purple-rose or yellow; tube 1–1.5 × as long as calyx; limb 1.5–2.5 cm; lobes broadly obovate, deeply 2-lobed; lobules entire or 2- or 3-toothed. Pin flowers: stamens in lower 1/2 of corolla tube; style slightly exceeding middle of corolla tube or reaching annulus. Thrum flowers with

positions reciprocal. Capsule oblong-ovoid, nearly as long as calyx. Fl. Jun–Jul.

Limestone screes, moss-covered boulders, cliff edges; 4000–5500 m. W Sichuan, Xizang, NW Yunnan [Bhutan, N Myanmar].

1a. Corolla pale yellow 266c. subsp. *chlorodryas*

1b. Corolla purplish rose.

2a. Corolla tube glabrous
or scarcely puberulent

inside 266a. subsp. *dryadifolia*

2b. Corolla tube distinctly

pubescent inside 266b. subsp. *jonardunii*

266a. *Primula dryadifolia* subsp. *dryadifolia*

石岩报春(原亚种) shi yan bao chun (yuan ya zhong)

Primula chrysophylla I. B. Balfour & Forrest; *P. congestifolia* Forrest; *P. cyclophylla* I. B. Balfour & Farrer; *P. dryadifolia* subsp. *chrysophylla* (I. B. Balfour & Forrest) W.W. Smith & Forrest; *P. dryadifolia* subsp. *congestifolia* (Forrest) W.W. Smith & Forrest; *P. dryadifolia* subsp. *cyclophylla* (I. B. Balfour & Farrer) W.W. Smith & Forrest; *P. mystrophylla* I. B. Balfour & Forrest; *P. philoeresia* I. B. Balfour & Kingdon-Ward.

Scapes usually longer than leaf rosette. Corolla purplish rose; tube glabrous or scarcely puberulent inside.

Limestone screes; 4000–5500 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].

266b. *Primula dryadifolia* subsp. *jonardunii* (W.W. Smith) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 246. 1990.

翅柄岩报春 chi bing yan bao chun

Primula jonardunii W.W. Smith, Rec. Bot. Surv. India 4: 269. 1911; *P. oreina* I. B. Balfour & Cooper.

Scapes shorter than leaf rosette. Corolla purplish rose; tube conspicuously pubescent inside.

Moss-covered boulders, cliff ledges; 4000–5300 m. S and SE Xizang [Bhutan].

266c. *Primula dryadifolia* subsp. *chlorodryas* (W.W. Smith) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 247. 1990.

黄花岩报春 huang hua yan bao chun

Primula chlorodryas W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 16: 223. 1931.

Corolla pale yellow; tube pubescent inside. Fl. Jun–Jul.

* Limestone boulders; ca. 4500 m. NW Yunnan.

267. *Primula tsongpenii* H. R. Fletcher, J. Linn. Soc., Bot. 52: 340. 1942.

丛毛岩报春 cong mao yan bao chun

Herbs perennial, evergreen, with comparatively thin, many branched rhizomes, forming dense cushions. Leaves evergreen; petiole winged, nearly as long as leaf blade; leaf blade broadly elliptic to suborbicular, 3–5 mm wide, leathery, abaxially sparsely minutely glandular when young, glabrescent, base rounded to cordulate, margin 10–12-toothed and recurved, apex rounded. Scapes 3–5 mm, 1-flowered; bracts

broadly ovate to elliptic, 3–5 mm, ciliolate. Flower heterostylous. Pedicel less than 1 mm, scarcely yellow farinose. Calyx campanulate, ca. 5 mm, farinose at base, parted to ± middle; lobes broadly ovate to oblong, apex rounded to obtuse. Corolla pink, tinged with purple; tube 7–8 mm, with a projected tuft of hairs at throat; limb 1.3–1.8 cm wide; lobes broadly obovate, deeply 2-lobed; lobules emarginate. Pin flowers: stamens near base of corolla tube; style ca. as long as tube. Thrum flowers: stamens near middle of corolla tube; style ca. 1 mm. Capsule nearly as long as calyx. Fl. Jul.

* Moss-covered rocks; 4600–5000 m. SE Xizang.

268. *Primula triloba* I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 21. 1920.

三裂叶报春 san lie ye bao chun

Herbs perennial, forming cushions 5–10 cm in diam., consisting of much branched rhizomes and leaf rosettes. Leaves evergreen; petiole 4–5 mm, broadly winged, glabrous or sparsely pubescent toward apex; leaf blade broadly ovate to suborbicular, 3–4 mm wide, palmately 3-lobed to middle, apex obtuse or rounded and recurved; lobes ovate, 1–1.5 mm wide. Scapes indistinct to 3(–5) mm, glandular pilose, 1-flowered; bracts 1, linear, 3–4 mm. Flower subsessile, heterostylous. Calyx campanulate, 5–6 mm, densely fulvous glandular pubescent, parted to middle or below; lobes ovate-lanceolate, apex acute to obtuse. Corolla rose; tube ca. 7 mm, densely fulvous glandular pubescent outside, villous inside; limb 1–1.5 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 1 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule nearly as long as calyx. Fl. Aug.

* Pastures, rock crevices; 3700–5000 m. SE Xizang, NW Yunnan.

269. *Primula denticulata* Smith, Exot. Bot. 2: 109. 1806.

球花报春 qiu hua bao chun

Herbs perennial, encircled at base with broadly ovate, subfleshy bud scales 1.5–4 × 1–2 cm. Leaves in a rosette; petiole broadly winged, indistinct to nearly as long as leaf blade; leaf blade oblong to oblanceolate, 3–15 × 1.5–4 cm, enlarged to 20 cm or longer at fruiting, abaxially pubescent along veins or subglabrous, sometimes white or yellow farinose at fruiting, adaxially puberulent or glabrescent, base attenuate, margin denticulate, apex rounded to obtuse. Scapes 5–30 cm, elongated to 45 cm in fruit, glabrous or puberulent, efarinose or farinose in upper 1/2; umbels capitate, many flowered; bracts numerous, lanceolate, 5–10 mm, base overlapping and slightly gibbous. Flowers heterostylous. Pedicel 1–5 mm. Calyx narrowly campanulate, 5–10 mm, farinose or minutely glandular, parted to middle or below; lobes often tinged with purple, oblong-lanceolate, ciliolate. Corolla purple to pinkish purple, rarely white, with a yellow eye, exannulate; tube 0.8–1.2 cm; limb 1–2 cm wide; lobes obovate, deeply emarginate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style 6–7 mm. Thrum flowers: stamens ca. 6 mm above corolla tube; style 1.5–2 mm. Capsule subglobose, shorter than calyx. $2n = 22, 32, 34, 44, 22 + 5f$.

Moist meadows, grassy slopes, among shrubs, open forests; 1500–4100 m. Guizhou, W Sichuan, S Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].

- 1a. Flowering scapes 2(–4) 讚s long
as leaf rosette 269a. subsp. *denticulata*
- 1b. Flowering scapes usually 3–6 ×
as long as leaf rosette 269b. subsp. *sinodenticulata*

269a. *Primula denticulata* subsp. *denticulata*

球花报春(原亚种) qiu hua bao chun (yuan ya zhong)

Flowering scapes usually 2(–4) × as long as leaf rosette. Corolla usually 1–1.5 cm in diam. Fl. Apr–Jun.

Moist meadows, among shrubs, open forests; 2800–4100 m. S Xizang [Afghanistan, Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

269b. *Primula denticulata* subsp. *sinodenticulata* (I. B. Balfour & Forrest) W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 16: 21. 1928.

滇北球花报春 dian bei qiu hua bao chun

Primula sinodenticulata I. B. Balfour & Forrest in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 19. 1920; *P. alta* I. B. Balfour & Forrest; *P. cyanocephala* I. B. Balfour; *P. denticulata* Smith subsp. *alta* (I. B. Balfour & Forrest) W. W. Smith & H. R. Fletcher; *P. denticulata* subsp. *cyanocephala* (I. B. Balfour) W. W. Smith & Forrest; *P. limnoica* Craib.

Flowering scapes more robust, usually 3–6 × as long as leaf rosette. Corolla 1.5–2 cm in diam. Fl. Mar–Apr.

Grassy slopes, among shrubs; 1500–3000 m. Guizhou, W Sichuan, Yunnan [N Myanmar].

270. *Primula monticola* (Handel-Mazzetti) Chen & C. M. Hu, Fl. Reipubl. Popularis Sin. 59(2): 251. 1990.

中甸海水仙 zhong dian hai shui xian

Primula polyphylla (Franchet) Petitmengin var. *monticola* Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 61: 133. 1924.

Herbs perennial, glabrous, with overlapping, broadly ovate bud scales 1–3.5 × 1–2 cm. Leaves in a rosette; petiole broadly winged, concealed by basal bud scales; leaf blade narrowly elliptic to oblong or obovate, 3–6 × 1–2 cm, minutely glandular or sometimes scarcely farinose, base attenuate, margin denticulate, apex rounded to obtuse. Scapes 5–20 cm, yellow farinose toward apex; umbels capitate, many flowered; bracts triangular to lanceolate, 2–5 mm, base gibbous. Flowers heterostylous. Pedicel 1–5 mm, scarcely farinose. Calyx tubular-campanulate, 4–6 mm, ± farinose, parted to middle; lobes oblong-lanceolate to lanceolate, apex rounded to obtuse. Corolla pink to bluish purple, with a yellow eye, annulate; tube ca. 7 mm; limb 0.8–1.5 cm wide; lobes obovate, deeply 2-lobed. Pin flowers: stamens in lower 1/2 of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule ovoid, nearly as long as calyx. Fl. Apr.

* Pastures near water; 2400–3600 m. SW Sichuan, NW Yunnan.

271. *Primula atrodentata* W.W. Smith, Rec. Bot. Surv. India 4: 217. 1911.

白心球花报春 bai xin qiu hua bao chun

Primula atrodentata W.W. Smith subsp. *orestora* (Craib & R. E. Cooper) W.W. Smith & Forrest; *P. orestora* Craib & R. E. Cooper.

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole nearly obsolete to occasionally nearly as long as leaf blade; leaf blade elliptic to oblong or spatulate, 1.5–6 . 0.5–2 cm, tapered to base, minutely glandular, abaxially occasionally white or pale yellow farinose, margin denticulate, apex rounded to obtuse. Scapes (1–)4–8(–15) cm, sometimes to 20–30 cm in fruit, yellow farinose toward apex; umbels capitate, many flowered; bracts linear-lanceolate, 3–6 mm, base gibbous, apex acute. Flowers heterostylous. Pedicel nearly obsolete or to 1 mm. Calyx campanulate, 5–7 mm, glandular or scarcely farinose, parted slightly below middle; lobes lanceolate, usually tinged with purple at apex. Corolla mauve or pale blue-violet, with a white eye; tube ca. 2 × as long as calyx; limb 1–1.5 cm wide; lobes broadly obovate, deeply 2-lobed. Pin flowers: stamens near base of corolla tube; style ca. 1/2 as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, shorter than calyx. Fl. May–Jun. $2n = 22$.

Moist meadows, among shrubs; 3600–4700 m. SE Xizang [Bhutan, India, Nepal, Sikkim].

272. *Primula erythrocarpa* Craib, Notes Roy. Bot. Gard. Edinburgh 10: 206. 1918.

黄心球花报春 huang xin qiu hua bao chun

Primula denticulata Smith subsp. *erythrocarpa* (Craib) W.W. Smith & Forrest.

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole initially indistinct, 1/4–1/2 as long as leaf blade; leaf blade oblong-spatulate to oblong-elliptic, 2–10 × 1–3 cm, enlarged to 25 × 6 cm at fruiting, tapered to base, ciliolate, adaxially initially short septate pubescent, glabrescent or pubescent near margin, glandular, septate tawny pubescent along veins, margin denticulate, apex rounded. Scapes (6–)10–30 cm, elongated to 45 cm in fruit, ± farinose toward apex; umbel capitate, many flowered; bracts lanceolate, 5–10 mm, base slightly gibbous, apex acute to obtuse. Flowers heterostylous. Pedicel usually indistinct, rarely to 2 mm. Calyx campanulate, 4–9 mm, parted to below middle; lobes purplish, lanceolate, apex subobtuse. Corolla blue-violet, with an orange eye; tube 1–1.2 cm; limb 1–1.2 cm wide; lobes obovate, 2-lobed. Pin flowers: stamens ca. 3 mm above base of corolla tube; style 5–6 mm. Thrum flowers with positions reciprocal. Capsule globose, slightly shorter than calyx. Fl. May–Jun. $2n = 22, 22 + 5f$.

Grassy slopes, near water, open forests; 2900–4300 m. S Xizang [Bhutan].

273. *Primula laxiuscula* W. W. Smith, Trans. Bot. Soc. Edinburgh 35: 184. 1950.

疏序球花报春 shu xu qiu hua bao chun

Herbs perennial, without basal bud scales at anthesis. Leaves in a rosette; petiole nearly obsolete, rarely nearly as long as leaf blade; leaf blade obovate to obovate-spatulate, 2–4 × 1–2 cm, tapered to base, abaxially with dense multicellular hairs along veins, adaxially with dense multicellular hairs, margin minutely crenate-denticulate or sometimes subentire, apex rounded. Scapes 4–10 cm, farinose toward apex; umbels lax, 2–6-flowered; bracts linear, 4–5 mm, scarcely farinose. Flowers heterostylous. Pedicel 2–5 mm. Calyx campanulate, 5–7 mm, scarcely farinose or sparsely minutely glandular outside, densely farinose inside, parted to middle; lobes lanceolate, apex acute. Corolla pale violet; tube ca. 2 × as long as calyx; limb 1–2 cm wide; lobes obovate, deeply 2-lobed. Pin flowers: stamens near base of corolla tube; style ca. 2 mm shorter than tube. Thrum flowers: stamens slightly above middle of corolla tube; style ca. 2 mm. Capsule nearly as long as calyx. Fl. Apr–May.

* Open grassy slopes, near waterfalls; ca. 3000 m. SE Xizang.

274. *Primula pseudodenticulata* Pax in Engler, Pflanzenr. IV. 237(Heft 22): 91. 1905.

滇海水仙花 dian hai shui xian hua

Primula auriculata Lamarck var. *polyphylla* Franchet; *P. denticulata* Smith subsp. *stolonifera* (I. B. Balfour) W.W. Smith & Forrest; *P. polyphylla* (Franchet) Petitmengin; *P. pseudodenticulata* subsp. *polyphylla* (Franchet) W.W. Smith & Forrest; *P. stolonifera* I. B. Balfour.

Herbs perennial, without basal bud scales, sometimes with stolons from base. Leaves in a rosette; petiole broadly winged, indistinct to nearly as long as leaf blade; leaf blade oblanceolate to narrowly obovate-oblong, 3–10 × 0.5–2.5 cm, glabrous, abaxially minutely glandular, base attenuate, margin erose-denticulate, apex rounded or obtuse and obscurely apiculate. Scapes 6–35 cm, pale yellow farinose toward apex; umbels capitate, many flowered; bracts ovate to ovate-lanceolate, 2–5 mm, farinose, base slightly gibbous. Flowers heterostylous. Pedicel 1–10 mm, farinose. Calyx campanulate, 4–5 mm, farinose outside, parted nearly to middle; lobes narrowly ovate to oblong, apex obtuse. Corolla pink to lavender-blue, with a yellow eye; limb 7–12 mm wide; lobes obovate, deeply 2-lobed. Pin flowers: corolla tube nearly as long as calyx; stamens in lower 1/2 of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule elliptic, nearly as long as calyx. Fl. Dec–Feb.

* Gullies, near water, wet pastures; 1500–3300 m. SW Sichuan, Yunnan.

275. *Primula glomerata* Pax in Engler, Pflanzenr. IV.237(Heft 22): 92. 1905.

立花头序报春 li hua tou xu bao chun

Primula crispa I. B. Balfour & W.W. Smith.

Herbs perennial. Leaves in a rosette; petiole winged, 1–4 cm, base dilated, ± sheathing; leaf blade oblong to oblanceolate or obovate-spatulate, 3–15 × 1–3(–4) cm, tapered to base, abaxially densely minutely glandular, often white farinose when young, adaxially minutely glandular, margin erose-denticulate, apex rounded. Scapes 10–30 cm, glandular or farinose toward apex; umbels capitate, spherical; bracts lanceolate, 4–12 mm, clustered below umbel and not forming tuft at apex. Flowers erect or nearly so, heterostylous. Pedicel 2.5–10 mm. Calyx tubular-campanulate, 5–8 mm, minutely glandular, parted below middle; lobes lanceolate, apex acute. Corolla blue; tube longer than calyx 1.5–4 mm; limb 6–10 mm wide; lobes obovate, deeply 2-lobed. Pin flowers: stamens near base of corolla tube; style slightly shorter than tube. Thrum flowers with positions reciprocal. Capsule elliptic, slightly shorter than calyx. Fl. Sep. $2n = 18, 44, 44 + 1f$.

Grassy mountain slopes; 3300–5700 m. S Xizang [NE India, Nepal, Sikkim].

276. *Primula capitata* Hooker, Bot. Mag. 76: t. 4550. 1850.

头序报春 tou xu bao chun

Herbs perennial. Leaves in a rosette; petiole winged by decurrent leaf blade, indistinct to 1/2 as long as leaf blade; leaf blade oblong-oblanceolate to oblong-spatulate, 2–13 × 0.5–2(–3) cm, abaxially white or yellow farinose but occasionally only minutely glandular, adaxially minutely glandular, base long attenuate, margin erose-denticulate, apex acute to rounded. Scapes 10–45 cm, farinose at least near apex; umbels capitate, many flowered; bracts ovate to broadly lanceolate, 6–8 × 3–4 mm, clustered below umbel in a tuft or crown at apex. Flowers spreading or ± nodding, heterostylous. Pedicel 1–2 mm. Calyx often tinged with purple, campanulate, obscurely asymmetrical, 5–8 mm, parted to below middle; lobes broadly ovate to elliptic, rarely lanceolate, apex obtuse to acute. Corolla purple, with a yellow eye; limb 7–10 mm wide; lobes obovate, deeply 2-lobed. Pin flowers: corolla tube 6–7.5 mm; stamens ca. 2 mm above the base of corolla tube; style 3.5–4 mm. Thrum flowers: corolla tube 7–9 mm; stamens 5–7 mm above base of corolla tube; style ca. 1 mm. Capsule subglobose, shorter than calyx. Fl. Sep. $2n = 18$.

Mountain woodlands, grassy slopes, meadows, forest margins, glades in *Picea* forests, streamsides; 2700–5000 m. S Xizang, NW Yunnan [Bhutan, NE India, Sikkim].

- 1a. Leaves efarinose 276c. subsp. *sphaerocephala*
 1b. Leaves ± farinose.
 2a. Inflorescences discoid;
 leaves white farinose 276a. subsp. *capitata*
 2b. Inflorescences globose;
 leaves yellow to cream-
 yellow farinose 276b. subsp. *lacteocapitata*

276a. *Primula capitata* subsp. *capitata*

头序报春(原亚种) tou xu bao chun (yuan ya zhong)

Primula capitata subsp. *crispata* (I. B. Balfour & W.W. Smith) W.W. Smith & Forrester; *P. capitata* subsp. *mooreana* (I.

B. Balfour & W.W. Smith) W.W. Smith & Forrester; *P. crispata* I. B. Balfour & W.W. Smith; *P. mooreana* I. B. Balfour & W.W. Smith.

Leaves white farinose abaxially. Umbels appearing discoid from undeveloped flowers at apex.

Mountain woodlands, grassy slopes; 2700–5000 m. S Xizang [Bhutan, NE India, Sikkim].

276b. *Primula capitata* subsp. *lacteocapitata* (I. B. Balfour & W.W. Smith) W.W. Smith & Forrester, Notes Roy. Bot. Gard. Edinburgh 16: 18. 1928.

黄粉头序报春 huang fen tou xu bao chun

Primula lacteocapitata I. B. Balfour & W. W. Smith in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 178. 1916; *P. capitata* subsp. *craibeana* (I. B. Balfour & W. W. Smith) W. W. Smith & Forrester; *P. craibeana* I. B. Balfour & W. W. Smith.

Leaves cream-yellow or bright yellow farinose abaxially. Umbels spherical.

Meadows, forest margins; 3000–5000 m. S Xizang [NE India, Sikkim].

276c. *Primula capitata* subsp. *sphaerocephala* (I. B. Balfour & Forrester) W. W. Smith & Forrester, Notes Roy. Bot. Gard. Edinburgh 16: 18. 1928.

无粉头序报春 wu fen tou xu bao chun

Primula sphaerocephala I. B. Balfour & Forrester in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 45. 1915; *P. pseudocapitata* Kingdon-Ward.

Leaves efarinose. Umbels spherical.

* Glades in *Picea* forests, streamsides; 2800–4200 m. SE Xizang, NW Yunnan.

277. *Primula inopinata* H. R. Fletcher, J. Linn. Soc., Bot. 52: 339. 1942.

迷离报春 mi li bao chun

Herbs perennial, efarinose. Leaves in a rosette; petiole short, broadly winged; leaf blade oblong to oblong-obovate, 3–6 × 1–2 cm, tapered to base, with multicellular hairs, pinnately lobulate, apex obtuse; lobules irregularly dentate. Scapes to 18 cm, pubescent; racemes 1.5–2 cm, 8–10-flowered; bracts linear-oblong to oblanceolate, to 5 mm. Flowers heterostylous. Pedicel ca. 2 mm. Calyx tubular-campanulate, ca. 5 mm, glandular, parted below middle; lobes narrowly obovate, apex rounded. Corolla deep bluish violet; tube 1–1.2 cm; limb spreading, ca. 1.5 cm wide; lobes obovate, ca. 7 × 5 mm, deeply 2-lobed, with a minute apiculum in sinus. Pin flowers: stamens ca. 4 mm above base of corolla tube; style ca. as long as tube. Capsule elliptic, slightly longer than calyx.

* This species was described from a cultivated plant grown from seed collected by T. T. Yu (13861) from Yunnan, Zhongdien Xian (elevation 3000 m), but the wild specimen under this number is *Primula runcinata* (W. W. Smith & H. R. Fletcher) ex C. M. Hu. It may be a natural hybrid of *P. runcinata* and *P. pinnatifida* Franchet.

278. *Primula vialii* Delavay ex Franchet, Bull. Soc. Philom. Paris 3: 148. 1891.

高穗报春 gao sui bao chun

Primula littoniana Forrest; *P. littoniana* var. *robusta* Forrest.

Herbs perennial. Leaves in a rosette; petiole winged, usually 1/5–1/2 as long as leaf blade at fruiting; leaf blade elliptic to oblong or oblanceolate, 10–30 × 2–4(–7) cm, abaxially pubescent mainly along veins, adaxially pubescent, base attenuate, margin remotely hydathode-denticulate, apex rounded. Scapes (15–)20–45(–60) cm, glabrous, scarcely farinose toward apex; spikes narrowly pyramidal, 2–5 cm at anthesis, elongated to 10–18 cm in fruit, densely flowered; bracts linear-lanceolate, 1–2 mm. Flowers heterostylous. Calyx bright crimson when young, becoming pink, globose-campanulate, 4–5 mm, parted below middle; lobes ovate to ovate-lanceolate, apex acute or occasionally dentate. Corolla rose-purple; tube 7–9 mm; limb 5–6 mm wide; lobes ovate to elliptic, 4–5 × ca. 4 mm, apex acute. Pin flowers: stamens ca. 1.5 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule globose, slightly shorter than calyx. Fl. Jul. $2n = 20^*$.

* Wet meadows, near water in valleys; 2800–4000 m. SW Sichuan, N and NW Yunnan.

279. *Primula gracilentia* Dunn, Notes Roy. Bot. Gard. Edinburgh 5: 64. 1911.

长瓣穗花报春 chang ban sui hua bao chun

Herbs perennial. Leaves in a rosette; petiole narrowly winged, 1/5–1/2 as long as leaf blade; leaf blade elliptic to oblong-elliptic, 5–15 × 1–3(–4) cm, with sparse multicellular white hairs, base attenuate, margin irregularly blunt dentate, apex rounded. Scapes 10–20 cm, sparsely pilose, efarinose; inflorescences capitate or short spicate, 7–20-flowered; bracts green or tinged with purple, lanceolate. Flowers heterostylous. Calyx green or tinged with purple, cupular, 3–4 mm, parted to middle; lobes ovate, ciliate, apex acute. Corolla deep bluish purple; tube 6–8 mm; limb 5–6 mm wide; lobes ovate-lanceolate, 3–4 × 1–2 mm, apex acute. Pin flowers: stamens ca. 3.5 mm above base of corolla tube; style nearly as long as tube. Thrum flowers: stamens toward apex of corolla tube; style ca. 1 mm. Capsule unknown. Fl. Jun.

* Moist meadows, limestone rock crevices; 3000–4500 m. SW Sichuan, N and NW Yunnan.

280. *Primula violacea* W.W. Smith & Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 14: 54. 1923.

紫穗报春 zi sui bao chun

Herbs perennial. Leaves in a rosette; petiole winged, 1/5–1/2 as long as leaf blade; leaf blade oblanceolate to narrowly oblong, 3–9 × 1–1.5 cm, tapered to base, scabrous-pubescent, margin subentire or remotely blunt dentate, apex rounded. Scapes 15–28 cm, glabrous, sparsely glandular or thin white or cream-yellow farinose near apex; spikes 10- to many

flowered; bracts narrowly oblong, white farinose. Flowers reflexed, heterostylous. Calyx cupular, 4–5 mm, parted slightly below middle; lobes ovate, sparsely glandular, farinose at base, apex rounded to obscurely emarginate. Corolla deep violet; tube 9–10 mm; limb 6–9 mm wide; lobes nearly quadrate, 2–2.5 mm, obscurely emarginate. Pin flowers: stamens ca. 1 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule elliptic, slightly longer than calyx. Fl. Jul.

* Moist meadows, thicket margins; 3600–4300 m. SW Sichuan.

281. *Primula concholoba* Stapf & Sealy, Bot. Mag. 155: t. 9289. 1932.

短筒穗花报春 duan tong sui hua bao chun

Herbs perennial. Leaves in a rosette; petiole indistinct or sometimes slightly longer than leaf blade; leaf blade oblanceolate to oblong, 2–8 × 1–2 cm, tapered to base, abaxially sparsely pubescent or with hairs confined to veins, adaxially pubescent, margin irregularly coarse dentate, apex subrounded. Scapes 0.7–2 cm, glabrous, scarcely farinose; inflorescences capitate, globose, ca. 2 cm in diam., 10–20-flowered; bracts linear, to 5 mm, ± farinose, apex acute. Flowers homostylous. Calyx cupular, 4–5 mm, farinose or efarinose outside, parted to middle; lobes unequal, broadly ovate to suborbicular, glandular ciliolate, margin sometimes irregularly denticulate, apex obtuse to acute. Corolla bright violet, 0.8–1.2 cm; tube slightly longer than calyx, cylindrical for lower 3–4 mm, gradually dilated upward into subglobose-campanulate limb; lobes broadly elliptic to suborbicular, 2–3 mm, apex entire to slightly emarginate. Stamens ca. 4.5 mm above base of corolla tube. Style nearly reaching insertion of stamens. Capsule oblong, ca. 5 mm. Fl. Jun.

Steep grassy slopes, cliff edges, among dwarf *Juniperus* and *Rhododendron*; ca. 4000 m. SE Xizang [N Myanmar].

282. *Primula watsonii* Dunn, Notes Roy. Bot. Gard. Edinburgh 5: 63. 1911.

靛蓝穗状报春 dian lan sui zhuang bao chun

Primula cyanantha I. B. Balfour & Forrest; *P. watsonii* subsp. *cyanantha* (I. B. Balfour & Forrest) W.W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, shorter than to occasionally nearly as long as leaf blade; leaf blade narrowly oblong to oblanceolate, 5–18 × 1–3.5 cm; tapered to base, with multicellular white hairs, margin irregularly denticulate, apex rounded or obtuse. Scapes 9–25(–38) cm, glabrous, yellow farinose toward apex; inflorescences short spicate, 10- to many flowered; bracts linear-lanceolate, shorter than calyx. Flowers reflexed, heterostylous. Calyx broadly campanulate, 3–5 mm, farinose at base, parted slightly below middle; lobes ovate to lanceolate, glandular ciliolate, apex acute. Corolla deep indigo-purple; tube 7–10 mm, 2–5 mm in diam.; lobes subquadrate, 1–2 mm, apex truncate to obscurely emarginate. Pin flowers: stamens at middle of corolla tube; style ca. as long

as tube. Thrum flowers with positions reciprocal. Capsule unknown. Fl. Jul. $2n = 40^*$.

* Wet shaded areas on slopes, thicket margins; 3000–4000 m. W Sichuan, NW Yunnan.

283. *Primula giraldiana* Pax in Engler, Pflanz. IV.237(Heft 22): 92. 1905.

太白山紫穗报春 tai bai shan zi sui bao chun

Herbs perennial. Leaves in a rosette; petiole narrowly winged, 1/3–1/2 as long as leaf blade; leaf blade narrowly oblong to oblanceolate, 6–13 × 1–2.5 cm, with multicellular hairs, abaxially sometimes with hairs confined to veins, base cuneate-attenuate, margin irregularly blunt dentate, apex obtuse. Scapes 20–35 cm, glabrous, scarcely farinose toward apex; inflorescence short spicate, 10- or more flowered; bracts lanceolate, 1–2 mm. Flowers reflexed, homostylous. Calyx broadly campanulate, 3–4 mm, parted to middle or below; lobes ovate, ciliolate, apex acute. Corolla bluish violet to pale purple; tube 6–8 mm; limb 5–8 mm wide; lobes slightly spreading, broadly ovate to suborbicular, margin entire. Stamens at middle of corolla tube. Style slightly longer than stamens. Capsule elliptic, slightly longer than calyx. Fl. Jul–Aug.

* Grassy mountain slopes; 3000–3700 m. Shaanxi (Taibai Shan).

284. *Primula cernua* Franchet, Bull. Soc. Bot. France 32: 271. 1885.

垂花穗状报春 chui hua sui zhuang bao chun

Herbs perennial. Leaves in a rosette; petiole nearly obsolete to occasionally 1/2 as long as leaf blade; leaf blade broadly obovate to broadly oblanceolate, 3–12 × 1.5–4 cm, with multicellular white hairs, base short cuneate-attenuate, margin entire to obscurely repand-crenulate, apex rounded to obtuse. Scapes 5–40 cm, subglabrous, minutely glandular; inflorescences spicate, 0.8–2 cm, elongated to 4 cm in fruit, many flowered; bracts ovate, abaxially sparsely glandular. Flowers heterostylous. Calyx cupular, 3–4 mm, parted to middle; lobes ovate, glandular outside, apex acute or subrounded and apiculate. Corolla deep bluish purple, glandular outside; tube 8–11 mm; limb 7–10 mm wide; lobes ovate to oblong, ca. 3 mm wide, obscurely emarginate to subentire. Pin flowers: stamens near base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, ca. 2.8 mm in diam. Fl. Jul. $2n = 20^*$, $20 + 3f^*$.

* Grassy mountain slopes; 2700–3900 m. SE Sichuan, N Yunnan.

285. *Primula bellidifolia* King ex J. D. Hooker, Fl. Brit. India 3: 486. 1882.

菊叶穗花报春 ju ye sui hua bao chun

Primula adenantha I. B. Balfour & Cooper; *P. atricapilla* I. B. Balfour & Cooper; *P. hyacinthina* W. W. Smith; *P. menziesiana* I. B. Balfour & W. W. Smith; *P. micropetala* I. B. Balfour & Cooper.

Herbs perennial. Leaves in a rosette; petiole winged, 1/4–1/2 as long as leaf blade; leaf blade oblanceolate to oblong, 6–18 × 1–2.5 cm, pubescent, efarinose or white farinose abaxially, base attenuate, margin shallowly blunt dentate, apex obtuse to subrounded. Scapes 10–38(–45) cm, glabrous or nearly so, ± white farinose toward apex; inflorescence capitate or short spicate, 7–15-flowered; bracts small, green or blackish purple. Flowers reflexed, heterostylous. Calyx campanulate, 5–7 mm, white farinose or occasionally nearly efarinose, parted below middle or nearly to base; lobes oblong, glandular ciliolate, apex rounded to apiculate. Corolla mauve to pale blue-violet; tube 8–11 mm; limb 4–8 mm wide; lobes obovate, emarginate. Pin flowers: stamens 3.5–4 mm above base of corolla tube; style slightly shorter than tube. Thrum flowers: stamens ca. 8 mm above base of corolla tube; style 2–3.5 mm. Capsule ovoid, longer than calyx. Fl. Jun. $2n = 20, 40, 20 + 1–3f$.

Stony slopes, among *Rhododendron*, *Abies* forests; 4200–5300 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

286. *Primula aerinantha* I. B. Balfour & Purdom in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 146. 1916.

裂瓣穗状报春 lie ban sui zhuang bao chun

Herbs perennial. Leaves in a rosette; petiole narrowly winged, 1/4 to slightly longer than leaf blade; leaf blade oblong to elliptic, 1–6 × 0.5–3 cm, sparsely pilose, base short attenuate, margin crenate-dentate, apex rounded to obtuse. Scapes 12–35 cm, sparsely pubescent; inflorescences capitate or short spicate, 3–15-flowered; bracts green or tinged purple, linear, ca. 1/2 as long as calyx. Flowers heterostylous. Calyx cupular, ca. 3 mm, purplish outside, parted to middle or below; lobes ovate-lanceolate, apex acute glandular ciliolate. Corolla bluish purple; tube 8–10 mm; limb 7–10 × ca. 10 mm; lobes spreading, obovate-oblong, 3–4 × ca. 3 mm, slightly emarginate. Pin flowers: stamens 2–3 mm above base of corolla tube; style ca. 5 mm. Thrum flowers: stamens 6–8 mm above base of corolla tube; style ca. 2 mm. Capsule ovoid, slightly longer than calyx. Fl. Jul.

* Limestone rock crevices; 3000–4000 m. S Gansu.

287. *Primula deflexa* Duthie, Gard. Chron., S開. 3, 39: 229. 1906.

穗花报春 sui hua bao chun

Primula conica I. B. Balfour & Forrest; *P. muscarioides* Hemsley subsp. *conica* (I. B. Balfour & Forrest) W. W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole 2–7 cm, narrowly winged; leaf blade oblong to oblanceolate, 5–15 × 1.5–3 cm, base attenuate, margin irregularly denticulate or crenulate and ciliate, apex rounded to obtuse, with multicellular hairs. Scapes 30–60 cm, pilose or subglabrous; inflorescences compact spicate, usually efarinose, many flowered; bracts ligulate to lanceolate, 3–5 mm, ciliolate. Flowers reflexed, heterostylous. Calyx suburceolate, 4–5 mm, parted slightly below middle; lobes unequal, usually purplish, ovate. Corolla dark blue or rose-purple, tubular-

funnel-form 1.2–1.5 cm; limb slightly spreading, 6–9 mm wide; lobes subquadrate or subrounded, 2–3 mm wide, emarginate. Pin flowers: stamens 2–3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule elliptic, slightly longer than calyx. Fl. Jun–Jul. $2n = 40^*$.

* Wet pastures, woodland margins, moist areas in valleys; 3300–4800 m. W Sichuan, SE Xizang, NW Yunnan.

288. *Primula muscarioides* Hemsley, Bull. Misc. Inform. Kew 1907: 319. 1907.

麝草报春 she cao bao chun

Primula tsarongensis I. B. Balfour & Forrest.

Herbs perennial. Leaves in a rosette; petiole 1/5–1/2 as long as leaf blade; leaf blade obovate-spatulate to oblong-lanceolate, 5–15 × 2–3.5 cm, abaxially subglabrous except sparsely pubescent on midvein, adaxially ± pilose, base long attenuate, margin crenate-dentate, apex rounded. Scapes 18–40 cm, glabrous; inflorescences compact, short spicate, efarinose or sometimes farinose, many flowered. Flowers reflexed, heterostylous. Calyx subcampanulate, 4–5 mm, parted to middle; lobes unequal, ovate-elliptic; uppermost lobe usually tinged with dark purple, 2- or 3-toothed. Corolla deep purplish blue, tubular-funnel-form; tube ca. 1.2 cm; limb slightly spreading, 5–7 mm wide; lobes subquadrate, ca. 2 × 2 mm, apex truncate or slightly notched. Pin flowers: stamens 2–3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens 7–8 mm above base of corolla tube; style ca. 2 mm. Capsule elliptic, slightly longer than calyx. Fl. Jun–Jul. $2n = 40$.

* Moist meadows. SW Sichuan, SE Xizang, NW Yunnan.

289. *Primula pinnatifida* Franchet, Bull. Soc. Bot. France 32: 271. 1885.

羽叶穗花报春 yu ye sui hua bao chun

Primula apocrita I. B. Balfour & Forrest; *P. cephalantha* I. B. Balfour; *P. leptia* I. B. Balfour & Forrest; *P. mairei* H. L. 闕eill_; *P. pinnatifida* Franchet subsp. *apocrita* (I. B. Balfour & Forrest) W. W. Smith & Forrest; *P. pinnatifida* subsp. *cephalantha* (I. B. Balfour) W. W. Smith & Forrest.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, ca. as long as to slightly shorter than leaf blade; leaf blade elliptic to oblong or spatulate, 2–7(–10) × 1–2(–3) cm, sparsely pilose, base attenuate, margin crenate-serrate to coarsely dentate or incised-lobulate, apex rounded; lobules suboblong, with 1 or 2 teeth on each side. Scapes (5–)10–25 cm, glabrous or nearly so, pale yellow farinose toward apex; inflorescences spicate or subcapitate, usually many flowered. Flowers heterostylous. Calyx often tinged with purple, cupular, 4–5 mm, scarcely farinose, parted below middle; lobes unequal, ovate to oblong, apex obtuse to apiculate; posterior lobe often slightly emarginate. Corolla blue-purple; tube 7–8 mm; limb slightly spreading, 5–10 mm wide; lobes short oblong or subrotund, margin entire to obscurely crenate, apex rounded. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with

positions reciprocal. Capsule subglobose, nearly as long as calyx. Fl. Jul–Aug. $2n = 20, 40$.

* Grassy slopes, rock crevices; 3600–4200 m. SW Sichuan, N Yunnan.

290. *Primula buryana* I. B. Balfour, Bull. Misc. Inform. Kew 1922: 151. 1922.

珠峰垂花报春 zhu feng chui hua bao chun

Herbs perennial. Leaves in a rosette; petiole winged, ca. 1/2 as long as to nearly as long as leaf blade; leaf blade ovate to oblong-ovate, 1–2.5 cm. 4–10 mm, with multicellular hairs, base attenuate, margin irregularly deep crenate-dentate, apex rounded to obtuse. Scapes 3–9(–18) cm, with multicellular white hairs; inflorescences subcapitate, 2–5(–7)-flowered; bracts often tinged with purple, narrowly lanceolate to linear, 2–3 mm, densely pubescent. Flowers heterostylous. Calyx cupular, ca. 6 mm, pubescent outside, parted to middle; lobes slightly unequal, narrowly ovate to lanceolate, apex obtuse to acute. Corolla white or purple, funnel-form; tube 6–8 mm, pubescent; limb 1–1.5 cm wide; lobes obovate, 6–8 mm, deeply emarginate. Pin flowers: stamens ca. 2 mm above base of corolla tube; style ca. as long as tube. Thrum flowers: stamens ca. 4.5 mm above base of corolla tube; style ca. 2 mm. Capsule subglobose, nearly as long as calyx. Fl. Jun–Jul. $2n = 20$.

Damp meadows near gullies, among rocks on N-facing slopes; 4100–5000 m. S Xizang [Nepal].

291. *Primula sapphirina* J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 3: 492. 1882.

小垂花报春 xiao chui hua bao chun

Herbs perennial, forming dense mats consisting of many rosettes, base with remains of withered foliage. Petiole indistinct to nearly as long as leaf blade; leaf blade oblanceolate to obovate, 5–10 × 2–5 mm, tapered to base, abaxially pubescent along midvein, adaxially short white pubescent or subglabrous, margin coarsely pinnatifid-dentate with obtuse teeth, apex obtuse to rounded. Scapes 1–5 cm, sparsely glandular; inflorescences capitate, 1–4-flowered; bracts usually 2 or 3, lanceolate to narrowly ovate, 1.5–3 mm. Flowers sessile, ± nodding, heterostylous. Calyx often tinged with dark purple, cupular, 3–3.5 mm, finely glandular, parted to middle or below; lobes oblong to oblong-lanceolate, margin occasionally dentate, apex acute to obtuse. Corolla violet-purple; tube nearly as long as calyx; limb 4–6 mm; lobes subquadrate to obovate, 2-lobed. Pin flowers: stamens ca. 1.5 mm above base of corolla tube; style ca. 3 mm. Thrum flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. 0.5 mm. Capsule subglobose, slightly shorter than calyx. Fl. Jul.

Damp rock crevices, moss-covered rocks; 4000–5000 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

292. *Primula flabellifera* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 169. 1936.

扇叶垂花报春 shan ye chui hua bao chun

Herbs perennial. Rosette 1–1.5 cm in diam., with withered foliage at base. Leaf blade sessile, flabelliform to obovate-cuneate, 1–1.2 cm × ca. 5 mm, broadly rounded, glabrous, base cuneate-attenuate, margin entire except at apex, apex conspicuously acute triangular-dentate. Scapes 2–4 cm, glabrous; capitula 2–4-flowered; bracts linear to narrowly oblong, 1–2 mm. Flowers ± nodding, heterostylous. Calyx green or tinged with purple, cupular, ca. 3 mm, parted slightly below middle; lobes lanceolate to oblong, margin entire or with 2 or 3 teeth at apex. Corolla violet-purple, 7–10 mm; tube slightly longer than calyx; limb 5–7 mm wide; lobes oblong to obovate, ca. 3 × 1.2–2.5 mm, margin entire to obscurely denticulate at apex. Pin flowers: stamens ca. 2 mm above base of corolla tube; style exerted. Capsule globose, nearly as long as calyx. Fl. Jun–Jul.

* Rocks of grassy slopes; 4700–5000 m. SE Xizang (Nang-xian Xian).

293. *Primula eburnea* I. B. Balfour & R. E. Cooper in I. B. Balfour, Notes Roy. Bot. Gard. Edinburgh 9: 166. 1916.

乳白垂花报春 ru bai chui hua bao chun

Primula harroviana I. B. Balfour & R. E. Cooper.

Herbs perennial. Leaves in a rosette; petiole narrowly winged, nearly as long as leaf blade; leaf blade elliptic to oblong or ovate, 3–9 × 1.5–3.5 cm, copiously minutely glandular, base attenuate, margin dentate to dentate-lobulate, apex rounded. Scapes 10–20 cm, densely minutely glandular; capitula 6–12-flowered; bracts lanceolate, 2–6 mm, forming a crown at apex. Flowers nodding, heterostylous. Calyx cupular, 4.5–6(–8) mm, glandular outside, occasionally farinose inside, parted to middle; lobes unequal, oblong to suborbicular, margin entire to dentate at apex. Corolla cream-white, funnelliform, 1.3–1.6 cm, puberulent outside; basal cylindrical portion of tube slightly longer than calyx, gradually expanded upward; limb ca. 1 cm wide; lobes rounded, 3.5–5 mm, irregularly notched at apex. Pin flowers: stamens ca. 2.5 mm above base of corolla tube; style ca. 5 mm. Thrum flowers: stamens ca. 5.5 mm above base of corolla tube; style ca. 1 mm. Capsule subglobose, nearly as long as calyx. Fl. Jul–Aug.

Peat, glacial debris, cliffs; 4300–4800 m. SE Xizang [Bhutan].

294. *Primula sherriffiae* W.W. Smith, New Fl. & Silva 8: 131. 1936.

长管垂花报春 chang guan chui hua bao chun

Herbs perennial. Leaves in a rosette; petiole narrowly winged, 1–2.5 cm; leaf blade usually oblanceolate, sometimes subobovate to elliptic, 5–14 × 2.5–5 cm, tapered to base, fringed with multicellular white hairs, abaxially more copiously pilose, adaxially sparsely pilose, margin entire to remotely dentate, apex rounded. Scapes 4–10 cm, glabrous, sparsely farinose; inflorescences capitate, 2–7-flowered. Flowers subhorizontal, homostylous. Calyx cupular, 4–9 mm, ± farinose, parted to 1/3; lobes ovate. Corolla pale violet; tube 1.8–4 cm × 1.5–2 mm; limb 2–3 cm wide; lobes suborbicular, margin entire. Stamens toward apex of corolla tube. Style slightly longer than anthers. Capsule subglobose, 7–8 mm in diam. Fl. Jul.

Cliffs, stony grassy slopes; 1700–2700 m. SE Xizang [Bhutan, NE India (Assam)].

Known only from three widely disjunct sites in M^{sz}og, SE Xizang; SE Bhutan; and Mishimi Hills, Assam.

295. *Primula flaccida* N.P. Balakrishnan, J. Bombay Nat. Hist. Soc. 67: 63. 1970.

垂花报春 chui hua bao chun

Primula nutans Delavay ex Franchet (1886), not Georgi (1797); *P. penduliflora* Franchet ex Petitmengin (1908), not A. Karn ex Stein (1881).

Herbs perennial. Leaves in a rosette; petiole winged, ca. 1/3–1/2 as long as leaf blade; leaf blade elliptic to broadly oblanceolate, (3–)5–15 × 1.5–4(–5) cm, abaxially with hairs confined to veins, adaxially strigillose, base attenuate, margin repand-crenate to dentate, apex rounded to obtuse. Scapes 10–50 cm, farinose toward apex; inflorescences capitate to short spicate, 5–15-flowered; bracts linear to lanceolate, 1–3 mm. Flowers nodding, heterostylous. Calyx broadly campanulate, 5–6 mm, sparsely glandular outside, usually white farinose inside, parted to ± middle; lobes ovate to triangular-ovate, apex acute to dentate. Corolla violet, funnelliform, 2–2.5 cm; limb 2–2.5 cm wide; lobes ovate to suborbicular, short emarginate. Pin flowers: corolla tube ca. 1 cm; stamens ca. 2 mm above base of corolla tube; style nearly reaching mouth. Thrum flowers: corolla tube ca. 1.2 cm; stamens toward apex of corolla tube; style ca. 2 mm. Capsule subglobose, slightly shorter than calyx. Fl. Jun–Aug. $2n = 20^*$.

* Stony grassy slopes, *Pinus* forests; 2700–3600 m. W Guizhou, SW Sichuan, Yunnan.

296. *Primula spicata* Franchet, Bull. Soc. Bot. France 32: 269. 1885.

穗状垂花报春 sui zhuang chui hua bao chun

Primula balfourii H. L. 闕eill; *P. delicata* Forrest; *P. delicatula* Dunn.

Herbs perennial. Leaves in a rosette; petiole 1–3(–4) cm; leaf blade oblong-elliptic to obovate-elliptic, 1–5 × 1–2.5 cm, membranous when dry, abaxially with shorter hairs confined to veins, adaxially with multicellular hairs, base attenuate, margin blunt dentate to double serrate-crenate, apex obtuse to rounded. Scapes 5–20 cm, sparsely glandular, scarcely white farinose toward apex; spikes laxly (1 or)2–8-flowered; bracts linear to oblong, 2.5–4 mm. Flowers ± secund, 0.5–1.5(–3) cm apart, heterostylous. Calyx broadly campanulate, 2–4.5 mm, glandular or scarcely white farinose outside, densely white farinose inside, parted to near middle; lobes unequal, ovate, apex acute to dentate. Corolla bright blue, funnelliform, 1.5–2 cm; limb to 2 cm wide; lobes ovate to elliptic, deeply emarginate. Pin flowers: corolla tube 7–8 mm; stamens ca. 2 mm above base of corolla tube; style 5–6 mm. Thrum flowers: corolla tube 5–6.5 mm; stamens toward apex of corolla tube; style ca. 1 mm. Capsule subglobose, slightly shorter than calyx. Fl. Jun.

* Stony meadows, banks of rivulets, rocks in forests; 3000–3700 m. Yunnan (Dali Xian).

297. *Primula cawdoriana* Kingdon-Ward, Notes Roy. Bot. Gard. Edinburgh 15: 87. 1926.

条裂垂花报春 *tiao lie chui hua bao chun*

Herbs perennial. Leaves in a rosette; petiole winged, ca. 1/2 as long as leaf blade or shorter; leaf blade obovate to oblanceolate or spatulate, 2–4 × 0.5–1.5 cm, abaxially glandular pubescent along veins, adaxially scabrous-strigillose, base attenuate, margin irregularly deep dentate or serrate, apex obtuse to rounded. Scapes 6–15 cm, scarcely farinose toward apex; capitula 3–6-flowered; bracts ovate-lanceolate to suborbicular, 5–7 mm, forming crown at apex. Flowers nodding, heterostylous. Calyx green or tinged with purple, cupular, 6–8 mm, farinose inside, parted to 1/3; lobes oblong to broadly lanceolate, margin entire to dentate, apex obtuse. Corolla violet-mauve with greenish white lower part, narrowly campanulate, (1.7–)2–3 cm, basal cylindrical portion of tube 5–8 mm, gradually expanded upward; limb 2–3 cm wide; lobes narrowly oblong, 5–10 mm; lobules 2 or 3, linear-triangular. Pin flowers: stamens ca. 1.8 mm above base of corolla tube; style ca. as long as calyx. Thrum flowers with positions reciprocal. Capsule unknown. Fl. Aug.

* Stony grassy slopes; 4000–4700 m. SE Xizang.

298. *Primula klattii* N. P. Balakrishnan, J. Bombay Nat. Hist. Soc. 67: 63. 1970.

单朵垂花报春 *dan duo chui hua bao chun*

Primula uniflora Klatt (1872), not Gmelin (1805).

Herbs perennial. Leaves in a rosette; petiole usually ca. as long as leaf blade; leaf blade ovate to elliptic or spatulate, 4–10 × 4–8 mm, abaxially pilose along veins, adaxially with multicellular white hairs, base truncate to cuneate, margin incised dentate, crenate or occasionally pinnately lobulate, apex obtuse to rounded. Scapes 5–9 cm, glabrous, 1(or 2)-flowered; bracts oblong to subulate, 2–3 mm. Flowers sessile, heterostylous. Calyx dark red, campanulate, 6–8 mm, parted to middle; lobes oblong, apex apiculate to denticulate. Corolla pale violet; tube 8–10 mm, farinose inside; limb spreading, ca. 3 cm wide; lobes obovate-oblong, emarginate, usually with a mucro in sinus. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, nearly as long as calyx. Fl. Jun–Jul.

Alpine meadows; 4300–4700 m. S Xizang [Bhutan, NE India, Nepal, Sikkim].

299. *Primula sandemaniana* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 19: 314. 1938.

粉萼垂花报春 *fen e chui hua bao chun*

Herbs perennial. Leaves in a compact rosette; petiole indistinct to 1–2 cm; leaf blade elliptic to oblanceolate, 4–7 × 2–3 cm, tapered to base, fringed with hairs, abaxially with hairs confined to veins, adaxially pilose, margin irregularly remote dentate, apex obtuse to rounded. Scapes 8–11 cm, glabrous, ± white farinose; capitula 3–5-flowered; bracts ovate to elliptic, 1–4 mm, ± farinose. Flowers nodding, heterostylous. Calyx cupular, 7–10 mm, usually farinose, parted to 1/3; lobes subquadrate to suborbicular, margin entire to dentate at apex. Corolla bluish purple, broadly funnellform, 1.8–2.4 cm; tube ca. 1.1 cm; limb 2–3.5 cm wide; lobes

orbicular to broadly obovate, narrowly emarginate or erose-denticulate. Pin flowers: stamens ca. 3 mm above base of corolla tube; style ca. as long as tube. Thrum flowers with positions reciprocal. Capsule subglobose, nearly as long as calyx. Fl. May.

* Moist meadows; ca. 3800 m. SE Xizang (Nangxian Xian).

300. *Primula wollastonii* I. B. Balfour, Bull. Misc. Inform. Kew 1922: 152. 1922.

钟状垂花报春 *zhong zhuang chui hua bao chun*

Herbs perennial. Leaves in a rosette; petiole indistinct or to 1/3 as long as leaf blade, broadly winged; leaf blade oblanceolate to obovate, 1.5–5 × 1–2.5 cm, with multicellular white hairs, efarinose or white farinose abaxially, base attenuate, margin irregularly remote dentate, crenate to subentire, apex rounded. Scapes 9–20 cm, glandular, scarcely farinose toward apex; capitula 2–6-flowered; bracts small, lanceolate. Flowers nodding, heterostylous. Calyx green or dark purple, cupular, 5–8.5 mm, glandular puberulent or scarcely farinose, parted to ± middle; lobes ovate, margin apiculate or with 2 or 3 teeth at apex. Corolla campanulate, dark purple to bright blue, 1.8–2.5 cm; basal cylindrical portion of tube nearly as long as calyx, abruptly dilated upward; limb 1.5–2 cm; lobes broadly ovate, margin entire, apex obtuse to acute. Pin flowers: stamens ca. 3 mm above base of corolla tube; style nearly as long as calyx. Thrum flowers: stamens at mouth of basal cylindrical portion of tube; style 1–2 mm. Capsule subglobose, nearly as long as calyx. Fl. Jun. $2n = 20$.

Moist meadows, among boulders; 3900–4700 m. S Xizang (Nyalam Xian) [Nepal].

