
**马先蒿属** ma xian hao shu

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Herbs perennial or annual, rarely biennial, hemiparasitic. Leaves alternate, opposite, or whorled, usually pinnatifid to 1- or 2-pinnatisect, rarely entire or dentate; lower leaves usually long petiolate; upper leaves often ± sessile. Inflorescences terminal or flowers axillary; bracts usually leaflike. Calyx tubular to campanulate, often ± bilabiate, usually deeply cleft anteriorly, (2–)5-lobed. Corolla purple, red, yellow, or white, strongly bilabiate; upper lip (galea) hooded, enclosing anthers, laterally compressed, rounded or truncate, or terminating in teeth or in a beak; lower lip 3-lobed, usually spreading, external to upper lip in bud. Stamens 4, didynamous; filaments glabrous or pubescent; anthers mucronate or not. Stigma capitate. Capsule moderately compressed or not, loculicidal. Seeds numerous, reticulate or costate.

About 600 species: best represented in the mountains of SW China and widespread in the frigid and alpine zones of the northern hemisphere; 352 species (271 endemic) in China.

From the limited available data, the species of *Pedicularis* in China are pollinated by bumblebees gathering nectar and/or pollen on nectariferous non-beaked species, and pollen only, by scraping or vibrating, on beaked species including those with long corolla tubes (Macior, L. W. 1988. Plant Species Biol. 3: 61–66.; Macior, L. W. & S. K. Sood. 1991. Plant Species Biol. 6: 75–81.; Macior, L. W., pers. comm.).

The rank of series has been traditionally used in *Pedicularis* since the time of Prain’s work (Ann. Bot. Gard. (Calcutta) 3: 1–196, 1890). Sections (and subgenera) have also been used (e.g., by Bunge in Walpers, Repert. Bot. Syst. 3: 409–433, 1844; Li, H. L. Proc. Acad. Nat. Sci. Philadelphia 101: 1–214, 1949; Yamazaki, T. 1988. A revision of the genus *Pedicularis* in Nepal. *in*: Ohba, H. & Malla, S.B. (eds.), *The Himalayan Plants* 1: 91–161, and others). Because series names have been used widely (e.g., Tsong, P. C., 1955, Acta Phytotax. Sin. 4: 103–147; Tsong, P.C., 1963, Fl. Reipubl. Popularis Sin. 68) but sectional names only in revisions covering limited areas (e.g., Yamazaki, T. 1988) and since not all species have been assigned to sections yet, the rank of series is used here.

1a. Leaves opposite or whorled (or in ser. 26, 84, 86, 87 alternate apically).
2a. Leaves opposite or occasionally alternate.
3a. Corolla galea beakless.
   4a. Corolla galea toothless.
   5a. Leaves lanceolate to linear.
      6a. Leaves entire or obscurely crenate ................................................................. 50. *Salicifoliae*
      6b. Leaves pinnatifid to pinnatisect ................................................................. 102. *Flammeae*
   5b. Leaves ± ovate.
      7a. Corolla 3–3.5 cm; roots glabrous ................................................................. 21. *Salviiflorae*
      7b. Corolla less than 2 cm; roots densely yellow-brown pubescent ......................... 26. *Aloenses*
3b. Corolla galea beaked.
   4b. Corolla galea toothed.
   8a. Leaves mostly basal, stem leaves often only in 1 pair; flowers in a densely capitulate spike or flowers only 2 or 3.
      9a. Plants 2–4 cm tall; flowers few; galea without a protuberance at middle of margin on each side 87. *Collatae*
      9b. Plants usually more than 10 cm tall; galea with a protuberance at middle of margin on each side ................................................................. 89. *Cernuae*
   8b. Leaves mostly on stem, basal leaves few; flowers not in a dense capitulum, more than 2 or 3.
      10a. Corolla galea at least as long as lower lip.
           11a. Corolla apex with several teeth on each side of margin ............................ 76. *Lyratae*
           11b. Corolla apex obscurely 2-toothed ......................................................... 36. *Pteridifoliae*
      10b. Corolla galea shorter, only ca. 1/2 as long as lower lip, apex with only 1 tooth on each side of margin.
           12a. Calyx relatively large, with dense reticulate veins, teeth triangular, entire ........ 38. *Pentagonae*
           12b. Calyx relatively small, without dense reticulate veins, teeth leafflike, serrate ........ 84. *Atrovirides*
3b. Corolla galea beaked.
   13a. Corolla tube ± elongated, more than 2 × as long as calyx.
   14a. Stems usually flexuous, ascending, more than 40 cm tall.

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15a. Corolla beak bending downward ----------------------------------------------- 28. Flexuosae
15b. Corolla beak bending upward ----------------------------------------------- 33. Omiianae
14b. Stems diffuse or if erect then more than 10 cm tall.
16a. Plants low; stems short or sometimes nearly absent.
17a. Stems short, erect, ± woody; leaf segments few; corolla beak slightly recurved ....... 75. Urceolatae
17b. Stems often trailing or plants ± stemless, not woody; leaves pinnatisect; corolla beak
straight ........................................................................................................... 31. Axillares
16b. Stems ± elongated, diffuse.
18a. Stems herbaceous; calyx lobes shorter than calyx tube; galea not dilated apically, toothless
at margin ........................................................................................................... 86. Sikkimenses
18b. Stems ± woody; calyx lobes longer than calyx tube; galea dilated apically, toothed on lower
margin ........................................................................................................... 34. Batangenses
13b. Corolla tube not elongated, less than 2 × as long as calyx.
19a. Stems repent basally.
20a. Plants annual; leaves on stem, not fernlike .............................................. 77. Reptantes
20b. Plants perennial; leaves basal, fernlike ...................................................... 30. Vagantes
19b. Stems erect, not repent if diffuse.
21a. Beak of galea slender, usually S-shaped; leaves narrowly lanceolate to linear-lanceolate 80. Integrifoliae
21b. Beak of galea short, straight or curved, not S-shaped; leaves wider.
22a. Corolla with 2 colors .................................................................................... 73. Binariae
22b. Corolla with only 1 color.
23a. Leaves alternate, often pseudo-opposite throughout; flowers long pedicellate.
24a. Galea not crested, beak usually straight; calyx not or slightly cleft anteriorly.
25a. Plants 5–9 cm tall; stems 2–4; Xizang ......................................................... 96. Mychophilae
25b. Plants 30–70 cm tall; stems single; not in Xizang ........................................ 45. Racemosae
24b. Galea usually crested, sometimes inconspicuously; calyx deeply cleft anteriorly.
26a. Beak curved; calyx 2- or 3-lobed ................................................................. 97. Franchetianae
26b. Beak straight or falcate; calyx 3–5-lobed .................................................... 67. Strobilaceae
23b. Leaves opposite throughout; flowers not long pedicellate.
27a. Stem leaves long petiolate; inflorescences long spicate; calyx large, with dense reticulate
veins, lobes entire .......................................................................................... 39. Dichotomae
27b. Stem leaves short petiolate; inflorescences short; calyx small, without reticulate veins,
lobes serrate.
28a. Galea margin 1-auricled, apex of beak erose-denticulate ....................... 88. Pseudoasplenifoliae
28b. Galea margin not auricled, apex of beak not erose-denticulate.
29a. Galea marginally 2-toothed; leaves small, broadly ovate ......................... 85. Remotilobae
29b. Galea not marginally 2-toothed; leaves larger, narrower ............................ 79. Debiles
2b. Leaves usually in whorls of 3 or 4.
30a. Corolla galea beakless (short beaked in ser. 52, 22, 61, 59).
31a. Corolla galea toothed.
32a. Bases of whorled petioles of leaves or at least bracts connate, cupular .................. 40. Reges
32b. Bases of petioles of leaves and bracts not connate or cupular.
33a. Corolla tube strongly decurved in calyx, corolla ± S-shaped ...................... 55. Microchilae
33b. Corolla tube not strongly decurved in calyx, corolla not S-shaped.
34a. Calyx lobes 2, calyx tube deeply cleft anteriorly ........................................... 52. Ikomanae
34b. Calyx lobes 5, calyx tube slightly cleft anteriorly.
35a. Calyx lobes triangular or lanceolate, entire ................................................. 51. Rigidiae
35b. Calyx lobes ± leaflike, serrate ................................................................. 22. Melampyriflorae
31b. Corolla galea toothless.
36a. Bases of petioles of leaves and bracts connate, cupular ............................... 40. Reges
36b. Bases of petioles of leaves and bracts not connate or cupular.
37a. Corolla tube decurved basally.
38a. Corolla yellow, galea plicate; anthers apiculate at apex ............................. 53. Plicatae
38b. Corolla usually purple, red, white, or rarely yellow, galea not plicate; anthers not apiculate
at...
apex ............................................................ 54. *Verticillatae*

37b. Corolla tube erect or decurved apically.
40a. Plants annual; leaf segments 5–7 pairs ............................................................ 61. *Sinae*
40b. Plants perennial; leaf segments 7–17 pairs ....................................................... 1. *Gloriosae*
39b. Corolla tube decurved.
41a. Inflorescences and calyx densely tomentose ................................................. 81. *Pilostachyae*
41b. Inflorescences and calyx glabrous or sparsely pubescent.

42a. Corolla tube ± decurved at middle.
42b. Corolla tube slightly curved, expanded, or bent forward apically.
43a. Plants annual; stems (15–)30–80 cm tall, often branched apically; corolla 7–9 mm ...
58. *Molles*
43b. Plants perennial; stems 5–12 cm tall, simple; corolla 22–30 mm ......................... 57. *Caucasicae*
30b. Corolla galea beaked.
45a. Corolla tube ca. 2.5–3 × as long as calyx ............................................................. 43. *Cyathophyllae*
45b. Corolla tube less than 3 × as long as calyx.

46a. Bases of petioles of leaves and bracts connate, cupular.
47a. Galea navicular; beak indistinct ................................................................. 41. *Cyathophylloides*
47b. Galea not navicular; beak long, distinct ......................................................... 42. *Superbae*
46b. Bases of petioles of leaves and bracts not connate or cupular.
48a. Flowers scarcely 6 mm, in a dense capitate raceme ........................................... 25. *Coniferae*
48b. Flowers more than 10 mm.

49a. Beak of galea shorter than anther-containing part.
50a. Stems with curved branches ............................................................................. 23. *Longicaules*
50b. Stems unbranched, or with erect straight branches.
51a. Corolla tube decurved in calyx tube ............................................................. 56. *Cheilanthisfoliae*
51b. Corolla tube not decurved in calyx tube.
52a. Corolla tube decurved in throat of calyx tube ................................................ 23. *Longicaules*
52b. Corolla tube not decurved or decurved outside calyx lobes.
53a. Anther-containing part of galea red, goosehead-shaped; stem leaves in 1 or 2 pairs 90. *Tatsienenses*
53b. Anther-containing part of galea not red, not goosehead-shaped; stem leaves
numerous ........................................................................................................ 62. *Myriophyllae*

49b. Beak of galea longer than anther-containing part.
54a. Beak of galea coiled or twisted.
55a. Corolla tube bent at a right angle apically ....................................................... 83. *Meteororhynchae*
55b. Corolla tube not bent at a right angle apically.
56a. Corolla yellow or purplish, with yellowish tube apically and lower lip basally 74. *Pectinantiformes*
56b. Corolla purplish red or yellow, or yellow with purple galea.
57a. Calyx often less than 6 mm, lobes ± serrate; bracts narrower, serrate or pinnatifid 63. *Semitortae*
57b. Calyx often ca. 10 mm, lobes ± entire; bracts at least ovate and entire apically . 64. *Pectinatae*

54b. Beak of galea straight or slightly falcate-curved.
58a. Stems branched apically.
59a. Branches in whorls of 4–6, often woody; beak of galea slightly falcate-curved; calyx
lobes ovate; capsule ca. 1/2 exceeding calyx ........................................................ 24. *Graciles*
59b. Branches opposite or in whorls of 4, herbaceous; beak of galea bent upward; calyx
lobes triangular; capsule ca. 4/5 exceeding calyx .................................................. 27. *Moupinenses*
58b. Stems unbranched apically.
60a. Corolla tube decurved in calyx ................................................................. 56. *Cheilanthifoliae*
60b. Corolla tube not decurved.

61a. Basal leaves large, persistent, ± lanceolate or narrowly oblong, pinnatifid, with many
segments; stem leaves in whorls of 3 ................................................................. 82. *Tantalarhynchae*

61b. Basal leaves smaller or not persistent, ± elliptic to ovate, with few segments; stem leaves sometimes opposite ............................................................ 78. Brevifoliae

1b. Leaves alternate or at least alternate apically (or in ser. 1, 30, 33, 34, 36, 37, 45, 67, 102 rarely with pseudo-opposite or opposite leaves).

62a. Corolla slightly beaked or beakless (beak not longer than wide).

63a. Galea with marginal teeth near apex.

64a. Galea with several marginal teeth on each side near apex ............................................. 105. Rhynchodontae

64b. Galea usually with a distinct marginal tooth on each side of apex.

65a. Lower corolla lip usually erect or slightly spreading, corolla tube usually not decurved.

66a. Plants branched ................................................................. 44. Pedicularis

66b. Plants usually unbranched.

67a. Basal leaves to 28 cm, with 5–9 pairs of segments .................................................... 36. Pteridifoliae

67b. Basal leaves less than 12 cm, with more segments.

68a. Plants reddish or reddish brown hirtellous; basal leaves persistent ......................... 20. Hirtellae

68b. Plants not hirtellous; basal leaves not persistent ........................................................ 16. Striatae

65b. Lower corolla lip spreading, corolla tube usually decurved.

69a. Leaves opposite or sometimes alternate apically; stems ascending ............................. 84. Atrovirides

69b. Leaves alternate; stems erect.

70a. Plants usually less than 15 cm tall.

71a. Plants without persistent marcescent leaves at base; inflorescences more than 1/2 total height of plants, centrifugal ................................................................. 104. Pseudo-oederianae

71b. Plants with persistent marcescent leaves at base; inflorescences short spicate or capitate 92. Merrillianae

70b. Plants usually more than 15 cm tall.

72a. Plants usually cespitose or procumbent to ascending.

73a. Corolla tube decurved apically, lower lip spreading; capsule oblique.

75a. Inflorescences terminal and basilar, usually distinctly centrifugal ............................ 103. Corydaloides

75b. Flowers few, axillary ................................................................. 87. Collatae

74b. Plants erect; flowers in a spike, or few and basilar, long pedicellate.

76a. Inflorescences short, capitate or flowers few, not distinctly centrifugal ..................... 91. Roseae

76b. Inflorescences elongated, spicate, with dense flowers ............................................... 102. Flammeae

63b. Galea without marginal teeth.

73b. Corolla tube usually rounded or obulate, lower lip not spreading; capsule not oblique.

77a. Flowers axillary.

78a. Plants usually stemless ................................................................. 29. Acaules

78b. Plants with distinct stems ................................................................. 26. Alenses

77b. Flowers usually in terminal inflorescences; plants with distinct erect stems.

79a. Apex of galea acute ..................................................................... 2. Grandiflorae

79b. Apex of galea usually rounded or obtuse.

80a. Throat of corolla expanded, lower lip long stipitate basally ................................. 3. Tsekouenses

80b. Throat of corolla not expanded, lower lip not stipitate.

81a. Stem leaves usually few; plants not drying black ................................................... 1. Gloriosae

81b. Stem leaves usually numerous; plants drying black or not.

82a. Leaves linear to linear-lanceolate, pinnatifid, plants to 1 m tall ............................ 4. Tristes

82b. Leaves ovate to elliptic-oblong, dentate to pinnatifid; plants less than 40 cm tall.

83a. Plants drying black; rhizomes distinct, rootstock developed, roots glabrous; leaves alternate; corolla large, galea falcate apically ........................................ 5. Galeatae

83b. Plants not drying black; without rhizomes, roots densely yellowish brown pubescent; leaves mostly opposite; corolla ca. 1.3 cm, galea ± straight ........................................... 26. Aloenses

62b. Corolla beaked.

84a. Corolla tube at least 2 x as long as calyx (except P. bicolor of ser. Wilsoniae).

85a. Plants usually diffuse; calyx lobes usually 5.
86a. Plants ± woody; leaves with linear segments; galea usually abruptly constricted into a straight beak ................................................................. 34. Batangenses
86b. Plants herbaceous; leaves with ovate to oblong segments; galea usually gradually constricted into a beak.
87a. Beak of galea bent upward ................................................................. 33. Omiianae
87b. Beak of galea not bent upward, usually straight or twisted ....................... 35. Muscicolae
85b. Plants erect or ± stemless; if stems diffuse, calyx lobes 2 or 3, not 5.
88a. Plants more than 10 cm tall, if smaller, corolla often yellow, or corolla red-purple and less than 1.5 cm.
89a. Inflorescences short, racemose, centripetal; galea 1-toothed on each side ............. 71. Amplitubae
89b. Inflorescences usually longer, centrifugal; galea toothless at margin.
90a. Lower corolla lip spreading, not enveloping galea ........................................ 111. Longiflorae
90b. Lower corolla lip not spreading, usually enveloping galea, only slender beak projecting 112. Megalanthae
88b. Plants less than 10 cm tall; corolla ± red-purple.
91a. Pedicel to 1–4 cm; galea circinate-incurved basally ...................................... 101. Neolatitubae
91b. Pedicel shorter; galea not incurved basally.
92a. Corolla tube expanded apically ............................................................... 100. Wilsoniae
92b. Corolla tube not expanded apically.
93a. Corolla with lower lip less than 2 cm wide; corolla tube slender, usually less than 0.75 mm wide ..................................................................................................................................... 99. Albiflorae
93b. Corolla with lower lip more than 2 cm wide; corolla tube usually more than 1 mm wide.
94a. Leaves pinnatifid; beak of galea usually downward uncinate ............................. 108. Robustae
94b. Leaves ± entire or only pinnatifid; beak of galea not downward uncinate ........... 110. Pumiliones
84b. Corolla tube less than 2 × as long as calyx.
95a. Galea usually marginally long ciliate.
96a. Galea navicular.
97a. Leaves linear to linear-lanceolate or oblong-lanceolate, pinnatifid or dentate .... 8. Craspedotrichae
97b. Leaves not linear, shorter and wider, segmented.
98a. Leaves pinnatisect, with linear-lanceolate segments ...................................... 17. Proboscideae
98b. Leaves double dentate to pinnatifidate, with shorter and wider segments.
99a. Leaves ± lanceolate-oblong, less than 3.5 × as long as wide ............................ 7. Dolichocymbae
99b. Leaves not linear to linear-lanceolate, more than 4 × as long as wide ............... 6. Rudes
96b. Galea not navicular.
100a. Beak of galea nearly as long as lower corolla lip.
101a. Leaves mostly basal, pinnatisect with lanceolate segments; beak of galea with apical tuft of hairs ................................................................. 18. Lachnoglossae
101b. Leaves mostly on stem, not pinnatisect; beak of galea without apical tuft of hairs.
102a. Lobes of lower corolla lip long stipitate basally, galea ± abruptly constricted into a slender beak ........................................................................................................... 11. Lasiophrydes
102b. Lobes of lower corolla lip not stipitate, galea gradually constricted into a beak.
103a. Plants usually more than 30 cm tall, to 80 cm; galea less than 3 mm wide, sparsely pubescent ................................................................. 9. Imbricatae
103b. Plants usually less than 30 cm tall; galea 4–5 mm wide, densely pubescent ... 10. Trichoglossae
100b. Beak of galea longer than lower corolla lip.
104a. Leaves linear or linear-lanceolate.
105a. Plants usually more than 30 cm tall, to 1 m; beak of galea not twisted; lobes of lower corolla lip narrowly lanceolate ......................................................... 12. Kongboenses
105b. Plants less than 30 cm tall; beak of galea S-shaped; lobes of lower corolla lip short, wide ................................................................................. 15. Kialenses
104b. Leaves not narrowly linear.
106a. Leaves ± ovate, usually more than 3.5 cm wide ....................................... 14. Excelsae
106b. Leaves linear-lanceolate to lanceolate-obleng, usually less than 3.5 cm wide (except P. angustilabris to 5.5 cm wide).
107a. Galea not twisted, densely villous at base and at margin; lobes of lower corolla lip not square-shaped .......................................................... 19. Recurvae

107b. Galea strongly twisted, glabrous or villous on lower margin and beak; lobes of lower corolla lip nearly square-shaped ..................................................... 15. Kialenses

95b. Galea not marginally long ciliate.

108a. Inflorescences distinctly centrifugal.

109a. Beak of galea more than 3 × as long as lower corolla lip ................. 107. Macrorhynchae
109b. Beak of galea shorter or slightly longer than lower corolla lip.

110a. Lower corolla lip less than 1.2 cm wide ................................................... 106. Filiculae
110b. Lower corolla lip usually more than 1.5 cm wide ............................... 109. Macranthae

108b. Inflorescences distinctly centripetal or indistinctly centrifugal.

111a. Stems weak, slender, usually diffuse; flowers usually axillary.

112a. Flowers usually in clusters at base of stems .......................................... 30. Vagantes
112b. Flowers not in clusters at base of stems, solitary.

113a. Galea with pairs of marginal teeth ................................................... 94. Odontophorae
113b. Galea without marginal teeth.

114a. Leaves without distinct reticulate veins abaxially; calyx tube without reticulate veins 31. Axillares
114b. Leaves with distinct reticulate veins abaxially; calyx tube with reticulate veins apically .......................................................... 32. Infirmae

115a. Inflorescences usually elongated, not interrupted.

116a. Stems to 80 cm tall; leaves relatively large; corolla relatively small, beak of galea bent upward, lower lip 1/4 to 1/3 as long as galea .................................................... 13. Subsurrectae
116b. Stems shorter; leaves relatively small; corolla relatively large, beak of galea bent downward only, lower lip longer .......................................................... 69. Oxycarpae

115b. Inflorescences usually subcapitate, few flowered, or ± elongated and interrupted basally.

117a. Plants less than 10 cm tall, without a distinct main stem.

118a. Leaves numerous, persistent, with several narrow segments .................. 93. Asplenifoliae
118b. Leaves few, not persistent, with fewer wider segments.

119a. Lower corolla lip more than 2 cm wide; galea usually robust, apex of beak 2-cleft 108. Robustae
119b. Lower corolla lip narrower; galea narrower, apex of beak not 2-cleft.

120a. Stems rigid; leaves alternate; roots numerous ....................................... 95. Paucifoliatae
120b. Stems usually weak, flexuous; leaves usually pseudo-opposite; roots few 96. Mychophilae

117b. Plants more than 10 cm tall.

121a. Pedicel to 3–11.5 cm; galea not twisted ............................................... 97. Franchetiana
121b. Pedicel less than 3 cm; galea strongly twisted laterally.

122a. Flowers ± in a capitulum.

123a. Corolla more than 3 cm; lower lip relatively wide, often completely enveloping galea .......................................................... 98. Pseudomacranthae
123b. Corolla usually less than 2.5 cm; lower lip relatively narrow, often spreading, not enveloping galea.

124a. Leaves to 2.5–13 × 14 cm, stem leaves often ovate-elliptic ............... 37. Phaceliifoliae
124b. Leaves smaller, ± oblong or lanceolate.

125a. Plants usually branched basally and at middle .................................. 67. Strobilaceae
125b. Plants unbranched or only branched basally.

126a. Corolla to 2.8 cm; beak of galea very long, S-shaped or semicircular 72. Rhinanthoides
126b. Corolla smaller; beak of galea shorter, not S-shaped or semicircular.

127a. Leaves pinnatifid or pinnatifidate ................................................... 95. Paucifoliatae
127b. Leaves pinnatisect or pinnatifidate ................................................... 68. Oliganthae

122b. Flowers ± in a raceme.

128a. Galea strongly twisted laterally at base .............................................. 70. Dissectae
128b. Galea not strongly twisted laterally at base.
129a. Leaves often ovate or elliptic, with few segments ......................... 49. Furfuraceae
129b. Leaves oblong to linear, with numerous segments, some merely crenate.

130a. Basal leaves cespitose; plants herbaceous; bracts petiolate .............. 95. Paucifoliatae
130b. Basal leaves not cespitose; plants ± woody; bracts sessile.

131a. Leaves only double dentate or entire.
132a. Beak of galea distinct ................................................................. 45. Racemosae
132b. Beak of galea indistinct .............................................................. 46. Carnosae
131b. Leaves pinnatipartite to pinnatisect.
133a. Pedicel relatively short; beak of galea short or obscure ................ 47. Microphyllae
133b. Pedicel relatively long, distinct; beak of galea slender ................. 48. Polyphyllatae

Herbs tall, not drying black. Stems often single, erect. Leaves alternate or in pseudo-whorls, pinnatifid to pinnatisect. Inflorescences long spicate. Calyx 5-lobed. Corolla large; tube erect, 2–3 × as long as calyx; galea toothless, marginally villous.

About six species: Europe to N Asia; two species in China.

1a. Plants with basal leaves; calyx lobes serrate; corolla pubescent only along galea margin, middle lobe of lower lip without 2 teeth at base .......................................................... 1. P. sceptrum-carolinum
1b. Plants without basal leaves; calyx lobes often entire; corolla pubescent throughout, middle lobe of lower lip with 2 teeth at base .......................................................... 2. P. odontochila


Herbs perennial, to 60 cm tall, glabrous or sparsely ciliolate. Stems often single. Basal leaves in a rosette; petiole to 12 cm; leaf blade oblongoblong, to 3 × 4 cm, pinnatifid to pinnatisect; segments 7–17 pairs, ovate to oblong, pinnatilobate, incised-double dentate, teeth white and callose. Stem leaves few, alternate or in pseudo-whorls of 3, similar to basal leaves but smaller. Inflorescences to more than 20 cm. Flowers often pseudo-opposite or in pseudo-whorls, lax; bracts broadly ovate. Calyx 1–1.5 cm; lobes serrate. Corolla yellow, sometimes purple-red at apex of lower lip and galea, to 3.8 cm, glabrous except on galea; tube ca. 1.5 cm; lips connivent; galea falcate, densely bearded along margin (corolla otherwise glabrous); lower lip with middle lobe entire. Filaments glabrous apiically. Capsule globose, ca. 2 cm, short mucronate. Fl. Jun–Aug. fr. Aug–Sep. 2n = 32.

Swampy woods, moist banks, marshy meadows; 400–500 m. Heilongjiang, Jilin, Liaoning [Japan, Kazakhstan, Mongolia, Russia; C and N Europe].


Swampy woods, moist banks, marshy meadows; 400–500 m. Heilongjiang, Jilin, Liaoning [Japan, Kazakhstan, Mongolia, Russia; C and N Europe].


齿唇马先蒿 chi chun ma xian hao

Herbs to 40–50 cm tall, gray-white silky pubescent throughout. Stems single. Leaves on stem, not forming basal rosette, alternate, sessile, obloneglong, 5–8 × 2–3 cm, pinnatifid; segments dentate. Inflorescences spicate; bracts leaflike, small. Calyx ca. 1 cm; lobes equal, often entire. Corolla 4–4.5 cm, pubescent throughout; lips connivent; galea erect, 1.5–1.8 cm, marginally bearded; lower lip slightly shorter than galea, 3–4 × 5–6 mm, middle lobe with 2 teeth at base. Filaments glabrous. Fl. Jul.


野苏子系 ye su zi xi
Herbs tall, drying black. Stems often many branched. Leaves alternate, large, 2- or 3-pinnatisect. Inflorescences long racemose, centripetal. Corolla large; galea toothless, apex acute. Anthers apiculate.
One species: China and Russia (Far East).

野苏子马先蒿 ye su zi ma xian hao
Herbs perennial, to more than 1 m tall, often many branched. Roots fascicled, ± fleshy. Stems stout, hollow, ribbed, densely and minutely appressed puberulent. Basal leaves withering early; petiole to 7 cm; leaf blade ovate-oblong, to 23 cm, 2-pinnatisect; segments lanceolate, pinnatifid to pinnatisect, dentate, teeth white and callose. Inflorescences long racemose, centripetal, lax; bracts subtriangular, inconspicuous. Calyx ca. 8 mm; lobes 5, equal, triangular, serrate. Corolla purple, 2.5–3.5 cm; lips ± connivent; galea falcate, marginally densely bearded; lower lip slightly shorter than galea. Filaments glabrous. Capsule ovoid, ca. 1.3 cm × 9 mm, apiculate. Fl. Jul–Aug, fr. Aug–Sep.
Swampy meadows; 300–400 m. Jilin, Nei Mongol [Russia].

茨口系 ci kou xi
Herbs not drying black. Stems many branched basally. Leaves alternate; basal leaves numerous, long petiolate, pinnatifid to pinnatisect. Inflorescences often capitate, few flowered. Corolla often purple spotted, large, throat expanded; galea falcate, rounded or obtuse apically; toothless; lower lip long stipitate basally.
One species: China and N Myanmar.

茨口马先蒿 ci kou ma xian hao
Herbs, perennial, 10–60 cm tall, pubescent throughout. Roots fascicled, slender. Basal leaves in a rosette; petiole (1–)2–10 cm; leaf blade lanceolate-oblong to ovate-elliptic, 2–8 cm; segments 4–10 pairs, oblique ovate to triangular, pubescent, margin double dentate. Stem leaves absent or few, similar to basal leaves but with shorter petioles and smaller. Inflorescences capitate or racemose, elongating to more than 25 cm, lax; bracts leaflike. Pedicel ca. 9 mm. Calyx ca. 1 cm; lobes 5, unequal. Corolla pale yellow to rose, often purple spotted, to 3 cm; tube slightly longer than calyx; galea densely pubescent apically. Filaments 2 pubescent, 2 glabrous; anthers apiculate. Fl. Jun–Sep, fr. Aug–Oct.
Dry stony pastures among Pinus and Rhododendron scrubs; 3000–4500 m. SW Sichuan, NW Yunnan [N Myanmar].

阴郁系 yin yu xi
Herbs to 1 m tall, drying black. Roots single, somewhat fleshy, with a tuft of fibrous roots near top. Stems unbranched. Stem leaves usually numerous. Leaves alternate, sessile, linear to linear-lanceolate, pinnatifid or pinnatisect. Inflorescences racemose. Corolla yellow or pale yellow; galea falcate, toothless, apex acute or obtuse, beakless; lower lip not spreading.
Three species: China, Russia (Siberia); all three in China.
1a. Galea not densely pubescent at margin; bracts longer than flowers ............................................. 7. P. shansiensis
1b. Galea densely pubescent at margin; bracts shorter than flowers.
   2a. Corolla 2.6–3 cm; galea 4–5 mm wide; calyx lobes entire or obscurely serrate; filaments glabrous 5. P. tristis
   2b. Corolla 4–4.5 cm; galea 6–8 mm wide; calyx lobes distinctly serrate; filaments sparsely pubescent 6. P. paiana

阴郁马先蒿 yin yu ma xian hao
Herbs perennial, 15–50 cm tall. Stems hollow, with lines of hairs. Leaves linear to linear-lanceolate, to 2 cm, abaxially with long hairs along midvein, adaxially white pubescent, pinnatifid or pinnatisect. Inflorescences racemose. Corolla yellow or pale yellow; galea falcate, toothless, apex acute or obtuse, beakless; lower lip not spreading. Filaments glabrous. Fl. Jun–Aug, fr. Jul–Sep. 2n = 16.
Alpine and subalpine wet meadows, shrubby grassland; 2700–3200 m. Gansu, Shanxi [Mongolia, Russia (Siberia, Far East)].

白氏马先蒿 bai shi ma xian hao
Pedicularis tristis Linnaeus var. macrantha Maximowicz.
Herbs perennial, to 35 cm tall. Stems erect, pubescent, longitudinally striate. Leaves mostly on stem, lanceolate-oblong, to 8 × 2 cm, sparsely pubescent, pinnatifid; segments 10–15 pairs, dentate. Bracts leaflike, longer than calyx, shorter than flowers. Calyx pubescent; tube to 1.5 cm; lobes 5, ± equal, lanceolate-oblong, distinctly serrate. Corolla yellow, 4–4.5 cm, pubescent; tube ca. as long as galea; galea 6–8 mm wide, margin densely ciliate, apex acute; lower lip ca. as long as galea, lobes ± equal. Filaments sparsely pubescent. Fl. Jul–Aug, fr. Aug–Sep.


山西马先蒿 shan xi ma xian hao

Herbs perennial, to 70 cm tall. Stems hollow, with lines of hairs. Leaves lanceolate-linear, 5–12 × 0.8–4.5 cm, with sparse, long, white hairs, pinnatifid; segments 9–15 pairs, triangular-ovate to lanceolate-oblong, pinnatifid, margin dentate-incised, teeth callose. Inflorescences to 18 cm, interrupted basally; bracts leaflike, longer than flowers. Calyx ca. 1.4 cm, slightly cleft anteriorly; lobes 5, unequal, posterior lobe smaller than lateral ones. Corolla pale yellow, ca. 4.5 cm, densely glandular pubescent throughout; tube to 2.5 cm; galea margin not densely pubescent, apex obtuse. Filaments glabrous. Capsule oblong-ovoid, slightly compressed, ca. 2 cm × 9 mm, apex acute. Seeds triangular, ca. 4 × 2 mm. Fl. Jun–Aug, fr. Jul–Sep.

- Alpine grassy slopes, thickets; 1200–2400 m. Henan, Shaanxi, Shanxi.


显盔系 xian kui xi

Herbs drying black. Rhizomes distinct; rootstock developed, roots glabrous. Stems erect, unbranched. Stem leaves alternate, sessile, ovate to elliptic-oblong, margin double dentate. Flowers few, large; galea red, falcate apically, toothless, margin not long bearded, apex obtuse.

- One species: endemic to China.


显盔马先蒿 xian kui ma xian hao

Herbs perennial, 15–35 cm tall. Stems hollow, with lines of hairs. Leaves alternate, sessile, lanceolate-oblong to ovate-elliptic. Middle leaves larger than basal and apical leaves, to 4 × 2.2 cm, abaxially sparsely villous along midvein, adaxially brown pubescent along midvein, base broadly cuneate to rounded, apex obtuse to acute. Inflorescences lax racemes, capitate at anthesis, elongating in fruit, ± sessile; bracts leaflike. Calyx ca. 1.1 cm, sparsely villous along midvein; lobes 5, unequal. Corolla purple, 2–2.2 cm; tube barely exceeding calyx, sparsely pubescent; galea ca. 5 mm wide; lower lip ca. 1.3 cm, ciliate. Filaments glabrous; anthers apiculate. Capsule broadly ovoid, compressed, ca. 1.5 × 1 cm, apex acute. Fl. Aug, fr. Sep.

- Grassy slopes; 3500–4400 m. NW Yunnan.


粗野系 cu ye xi

Herbs tall, drying black. Stems unbranched or sometimes branched apically. Leaves alternate, sessile, ± linear to linear-lanceolate, more than 4 × as long as wide, pinnatifid or pinnatisect. Inflorescences racemose or conical. Corolla navicular or falcate, slightly beaked.

Six species: China, N Myanmar; five species in China.

1a. Lower corolla lip stipitate basally; galea margin not bearded ........................................ 13. **P. prainiana**

1b. Lower corolla lip ± sessile; galea margin densely bearded.

2a. Corolla tube glabrous or sparsely pubescent externally; calyx glabrous ................................ 11. **P. princeps**

2b. Corolla tube pubescent externally; calyx glandular pubescent.

3a. Calyx 3–4 mm, lobes ± entire; corolla tube ca. 3 × as long as calyx .............................. 10. **P. decora**

3b. Calyx 5–7 mm, lobes serrate; corolla tube ca. 2 × as long as calyx.

4a. Leaf segments to 24 pairs; calyx 5–6.5 mm; capsule ca. 13 × 8 mm .............................. 9. **P. rudis**

4b. Leaf segments to 15 pairs; calyx to 7 mm; capsule ca. 17 × 9 mm .............................. 12. **P. dunniana**


粗野马先蒿 cu ye ma xian hao

Herbs perennial, to more than 1 m, usually branched apically, pubescent. Stems hollow. Stem leaves clasping, lanceolate-linear, 3–15 × 0.8–2.2 cm, pinnatifid; segments to 24 pairs, oblong to lanceolate, pubescent, margin double dentate.

Inflorescences long spicate, more than 30 cm, glandular pubescent; bracts leaflike below, ovate above, longer than calyx. Calyx 5–6.5 mm, densely white glandular pubescent; lobes 5, ± equal, serrate. Corolla white, 2–2.2 cm; tube ca. 1.2 cm, pubescent externally; galea purple-red apically, front yellow, navicular, margin densely bearded, apex mucronulate, bent slightly upward; lower lip ± sessile, ca. as long as galea, ciliate.

- Grassy slopes, Picea forests, Betula forests; 2200–3400 m. W Gansu, Nei Mongol, Qinghai, Shaanxi, N Sichuan, E Xizang.


美观马先蒿 mei guan ma xian hao

Pedicularis lasiantha H. L. Li.

Herbs perennial, to 1 m tall, pubescent. Stems branched apically or unbranched, sparsely white villous. Leaves narrowly lanceolate, to 10 × 2.5 cm, pinnatifid; segments 20 pairs, oblong-lanceolate, margin double dentate. Inflorescences long spicate, interrupted basally, densely glandular pubescent; bracts leaflike below. Calyx 3–4 mm, densely glandular pubescent; lobes 5, triangular, ± entire. Corolla yellow; tube ca. 1.2 cm, ca. 3 × as long as calyx, pubescent outside; galea navicular, ca. as long as lower lip, margin densely bearded; lower lip ± sessile. Capsule ovoid, compressed, ca. 1.4 cm × 8 mm, apex short acuminate. Fl. Jun–Jul, fr. Aug.

- Grassy slopes, Picea forests, Betula forests; 2200–2800 m. S Gansu, W Hubei, S Shaanxi, NE Sichuan.


高超马先蒿 gao chao ma xian hao

Pedicularis aequibarbis Handel-Mazzetti.

Herbs perennial, more than 1 m tall. Stems branched apically or unbranched, usually shiny black, pubescent. Leaves clasping, lanceolate, 2.5–8 × 0.5–2.4 cm, abaxially sparsely white pubescent, adaxially brown pubescent along midvein, pinnatifid; segments 18 pairs, lanceolate-oblong, margin double dentate. Inflorescences long racemose, to more than 20 cm, elongating to 26 cm in fruit, glandular pubescent; upper bracts slightly longer than calyx. Calyx to 7 mm, densely glandular pubescent or not; lobes 5, serrate. Corolla yellow, to 1.5 cm; tube ca. 1.2 cm, pubescent; galea navicular, margin densely bearded; lower lip ± sessile, nearly as long as galea. Capsule ovoid-oblong, ca. 1.7 cm × 9 mm, apex acute. Seeds ca. 3 × 1.2 mm, reticulate. Fl. Jul, fr. Aug–Sep.

- Grassy slopes, thickets, forests; 2800–3500 m. W Sichuan, NW Yunnan.


邓氏马先蒿 deng shi ma xian hao


帕兰氏马先蒿 pa lan shi ma xian hao

Herbs perennial. Stems single, to 45 cm tall, erect, rigid, hollow, striate, leafy. Leaves linear-oblong, 7–10 × 1.5–2 cm, base auriculate, pinnatisect; segments 15–25 pairs, ovate-oblong, margin acute-dentate. Inflorescences erect, dense; bracts linear-oblong, basal ones longer than flowers, upper ones shorter than calyx. Pedicel 2–3 mm. Calyx ca. 1.6 cm × 5 mm, membranous, hirtellous; lobes 5, unequal. Corolla tube ca. 1.7 cm, slightly longer than calyx; galea navicular, margin not bearded, sparsely pubescent abaxially; lower lip stipitate basally, ciliate. Filaments glabrous. Fl. Jul, fr. Aug.

- Scrubby slopes; 3000–3700 m. S Xizang [N Bhutan].


长舟系 chang zhou xi

Herbs drying black. Stems erect, not or rarely branched. Leaves ± lanceolate-oblong, less than 3.5 × as long as wide, margin lobed or double dentate. Corolla galea navicular; beak short.

- One species: endemic in China.


长舟马先蒿 chang zhou ma xian hao

Pedicularis macrocalyx Bonati.

Herbs perennial, 13–40 cm tall. Stems rarely branched, longitudinally grooved, with lines of brown hairs.

Leaves alternate, sessile; basal leaves scalelike; stem leaves ovate-oblong to lanceolate-oblong, 2.5–6 × 0.3–2 cm, middle leaves largest, abaxially sparsely villous along midvein, adaxially densely brown pubescent along midvein, margin lobed or double dentate. Inflorescences capitate and 3- or 4-flowered to short racemose and more than 10-flowered, elongating to 12 cm in fruit; bracts leaflike. Calyx ca. 9 mm; lobes 5,
ovate, serrate. Corolla deep rose to blackish purple, 2.3–2.8 cm; tube ca. 1.5 × as long as calyx, glabrous; galea sparsely pubescent, margin densely bearded; lower lip much shorter than galea. Filaments glabrous. Capsule compressed, ovoid, to 2 cm × 9 mm, apex acute. Fl. Aug, fr. Aug–Sep.

- Alpine meadows, rocky slopes, among boulders; 3500–4300 m. W Sichuan, E Xizang, NW Yunnan.


缘毛系 yuan mao xi

Herbs tall. Stems erect or ascending, rarely branched. Leaves alternate, linear to linear-lanceolate or oblango-lanceolate, pinnatifid or dentate. Corolla galea often navicular; beak short.

About 14 species: Bhutan, China, E Nepal, Sikkim; ten species in China.

1a. Galea conspicuously navicular, much enlarged, bent upward.

2a. Lobes of lower corolla lip narrow, lanceolate ................................................................. 18. P. angustiloba

2b. Lobes of lower corolla lip wider, ± rounded.

3a. Galea much longer than lower corolla lip, ca. 1.6 cm; lower lip ca. 8 × 1.1 cm. 15. P. pseudosteiningeri

3b. Galea nearly as long as or slightly longer than lower corolla lip, ca. 1.4 cm; lower lip ca. 1.1 × 1.2 cm.

4a. Corolla tube short, nearly as long as calyx; 2 filaments pubescent, 2 completely glabrous

extreme apex ........................................................................................................... 16. P. trichomata

4b. Corolla tube longer, ca. 1.5 × as long as calyx; 2 filaments densely hirsute, 2 glabrous except sparsely hairy at anther insertion ................................................................ ............................. 17. P. lophotricha

1b. Galea inconspicuously navicular, slightly enlarged, pointing forward or bent downward.

5a. Plants less than 30 cm tall; leaves to 3 cm; corolla rose, beak of galea long .................. 24. P. craspedotricha

5b. Plants usually more than 30 cm tall; leaves to over 8 cm; corolla ± yellow, beak of galea indistinct.

6a. Calyx densely pubescent, lobes distinctly serrulate ........................................... 19. P. ingens

6b. Calyx glabrous or sometimes sparsely pubescent, lobes entire or rarely serrulate.

7a. Corolla tube ca. as long as to slightly longer than calyx; leaves with 50 or more teeth on each side.

8a. Calyx ca. 1.1 cm, lobes ± entire ........................................................................... 20. P. steiningeri

8b. Calyx to 1.3 cm, lobes distinctly serrulate .......................................... 21. P. pseudoingens

7b. Corolla tube 1.5–2 × as long as calyx; leaves with less than 50 teeth on each side.

9a. Leaves incised-dentate; 2 filaments pubescent, 2 glabrous ................................ 22. P. trichocymba

9b. Leaves incised-lobed, ca. 1/3 distance from margin to midvein; all filaments glabrous 23. P. tongolensis


假司氏马先蒿 jia si shi ma xian hao

Herbs perennial, drying black. Stems more than 40 cm tall, erect, grayish brown pubescent. Stem leaves clasping, sessile, linear-lanceolate, to 6 cm × 6 mm; middle leaves largest, margin incised-double dentate, teeth to 20 pairs. Inflorescences to 15 cm, dense; bracts leaflike, slightly longer than calyx. Calyx to 1.6 cm, glabrescent; lobes 5, triangular-ovate, ca. 4 mm. Corolla purple; tube ca. 2.8 cm; galea conspicuously navicular, to 1.6 cm × 5 mm, margin densely long pubescent; lower lip much shorter than galea, ca. 8 mm × 1.1 cm, lobes ± rounded. Filaments 2 pubescent, 2 glabrous. Fl. Jun–Aug, fr. Aug–Sep.

- Open stone meadows, forest margins, Picea forests; 3000–4300 m. SW Sichuan, Yunnan.


须毛马先蒿 xu mao ma xian hao

Herbs perennial, drying black. Stems to 40 cm tall, erect, unbranched, densely grayish brown pubescent, with few ovate scales at base. Leaves ± clasping, sessile, linear-lanceolate, 3.5–4.5 cm × 5–6 mm, base auriculate, margin incised-double dentate, apex acute. Inflorescences racemose, to 15 cm, dense; bracts leaflike. Pedicel 1–1.5 mm. Calyx oblong-ovate, to 1.2 cm; lobes 5, triangular, ± entire. Corolla yellow; tube ca. 1.1 cm; galea conspicuously navicular, ca. 1.5 cm × 4.5 mm, margin densely long pubescent; lower lip ca. 1.1 × 1.2 cm, lobes ± rounded, denticulate. Filaments 2 pubescent, 2 completely glabrous including extreme apex. Ovary ca. 4 mm.

- NW Yunnan.


盔须马先蒿 kui xu ma xian hao

Herbs perennial. Stems 35–40 cm tall, erect, unbranched, hispid. Leaves sessile, linear-lanceolate, 5–6.5 cm × 6–8 mm, adaxially glabrous except for

Herbs perennial, drying black. Stems to 1 m tall, erect, hollow, glabrescent, striate. Basal leaves small, scalelike; stem leaves linear, base hastate; segments more than 50 pairs, glabrous, margin incised-double dentate. Inflorescences to 30 cm, lax basally; bracts leafflike. Calyx to 1.3 cm, glabrous; lobes 5, triangular-lanceolate, to 5 mm, distinctly serrulate. Calyx purple spotted, conspicuously navicular, margin long ciliate, denticulate. Filaments pubescent. Fl. Jun–Aug, fr. Sep.

• Amidst grass in shrubbery; ca. 3900 m. W Sichuan.


Herbs perennial. Stems to 60 cm tall, erect, sturdy, unbranched, glabrous, striate, leafy throughout. Leaves sessile, linear-lanceolate, 6.5–7.5 cm × 7–10 mm, glabrous, base auriculate, margin incised-dentate. Inflorescences racemose, ca. 15 cm, interrupted basally; bracts leafflike, exceeding flowers. Pedicel 1–1.5 cm. Calyx 8–10 mm, glabrous; lobes 5, equal. Corolla yellow, 2.4–2.6 cm; tube erect, ca. 2 × as long as calyx; galea curved apically, inconspicuously navicular, 8–10 mm; beak scarcely 2 mm; lower lip ca. as long as galea. Filaments 2 pubescent, 2 glabrous. Fl. May–Jun, fr. Jul.

• 2700–4700 m. W Sichuan.


Herbs perennial. Stems 30–60 cm tall, erect, unbranched, long pubescent, leafy throughout. Leaves sessile, lanceolate-linear, 5–7 cm; lobes densely incised. Inflorescences spicate, more than 15 cm, loose. Calyx membranous, sparsely pubescent; lobes 5, ovate-lanceolate, to 3 × shorter than tube, long ciliate, entire. Corolla yellow; tube ca. 2 × longer than calyx; galea curved, inconspicuously navicular, margin densely red pubescent; beak curved; lower lip scarcely shorter than galea. Filaments glabrous.

• W Sichuan.


Herbs perennial. Stems 30–60 cm tall, erect, hollow, glabrescent, striate. Basal leaves small, scalelike; stem leaves linear, base hastate; segments more than 50 pairs, glabrous, margin incised-double dentate. Inflorescences to 30 cm, lax basally; bracts leafflike. Calyx to 1.3 cm, glabrous; lobes 5, triangular-lanceolate, to 5 mm, distinctly serrulate. Calyx purple spotted, conspicuously navicular, margin long ciliate, denticulate. Filaments pubescent. Fl. Jun–Aug, fr. Sep.

• High weedy slopes, grassy and scrubby slopes; 3000–4200 m. NW Yunnan.
Herbs perennial. Stems erect or ascending, to 26 cm tall, glabrous except for 2 lines of hairs, striate. Basal leaves scalelike; stem leaves ± clasping, sessile, linear-lanceolate, to 3 cm × 4.5 mm, crenate-double dentate. Inflorescences capitate or loosely racemose, 2–10-flowered; bracts leaflike. Pedicel 0.5–1.5 cm. Calyx ca. 7 mm; lobes 5, triangular, entire, ca. 1/2 as long as tube.

Corolla rose; tube scarcely longer than calyx; galea inconspicuously navicular, bearded along margin; beak slender, erose apically; lower lip shorter than galea. Filaments glabrous.

- Alpine meadows, forests; 3400–4500 m. Gansu, NW Sichuan.


覆瓦系 fu wa xi

Herbs usually 30 cm to 1 m tall, drying black. Stems erect, rarely branched. Leaves alternate, mostly on stem, sessile, linear to linear-oblong, pinnatifid. Inflorescences racemose. Corolla galea crescent-shaped, less than 3 mm wide, sparsely pubescent; beak distinct.

Four species: China, Bhutan, India, Nepal, and Sikkim; one species in China.


**克氏马先蒿 ke shi ma xian hao**

Herbs perennial, hirtellous. Rhizomes fleshy. Stems to 50–80 cm tall, rigid, hollow, unbranched, striate. Basal leaves withering early; stem leaves clasping, linear-oblong, 4–6 cm × 7.5–12.5 mm, base auriform; segments 15–25 pairs, ovate-oblong, incised-dentate. Inflorescences rigid, dense; bracts leaflike. Pedicel 2–3 mm. Calyx ca. 1.5 cm, pubescent, 5-lobed. Corolla purple; tube 1.6–1.8 cm; beak of galea ca. 5 mm, less than 3 mm wide, sparsely pubescent, apex 2-lobed; lower lip ciliate. Filaments glabrous. Capsule ovoid, ca. 1.6 cm, apiculate. Fl. Jul–Sep, fr. Aug–Sep. 2n = 16.

Among dwarf scrubs, steep banks below cliffs; 3700–4500 m. S Xizang [Bhutan, India, Nepal, Sikkim].


**毛盔系 mao kui xi**

Herbs usually less than 30 cm tall, drying black. Stems erect, unbranched. Stem leaves alternate, lanceolate-linear to lanceolate-oblong, pinnatifid to pinnatisect. Inflorescences capitake to racemose. Corolla purple-red or blackish purple, large; tube shorter or slightly longer than calyx; galea strongly curved, 4–5 mm wide, densely long pubescent at margin and back; beak cylindric, long, bent downward.

Two species: SW China, Bhutan, India, N Myanmar, Nepal, Sikkim; both species in China.

1a. Leaves 2–7 × 0.3–1.5 cm, with 20–25 pairs of segments; corolla tube bent basally, beak of galea very long.

1b. Leaves ca. 4.8 × 2 cm, with 8–12 pairs of segments; corolla tube erect, bent slightly apically, beak of galea shorter, lower lip ciliate


**毛盔马先蒿 mao kui ma xian hao**

Herbs perennial, 13–60 cm tall. Stems with 2 lines of hairs, striate. Leaves clasping, sessile, linear-lanceolate, 2–7 cm × 3–15 mm, pinnatifid to pinnatisect; segments 20–25 pairs, subglabrous except for pubescent midvein, margin double dentate. Inflorescences racemose, 6–18 cm; axis densely pubescent; bracts linear, inconspicuous, densely pubescent. Pedicel to 3 mm, pubescent. Calyx 1.2–1.6 cm, densely blackish purple villous, 5-lobed; tube 8–10 mm. Corolla blackish purple; tube bent basally; galea densely long pubescent apically, with purple-red hairs; beak slender, incurved, glabrous; lower lip glabrous; lobes broadly rounded. Capsule broadly ovoid, 1.2–1.5 cm × ca. 9 mm, slightly exceeding calyx. Fl. Jul–Aug, fr. Aug–Sep.


**Maoke系 mao ke xi**

Herbs low or medium sized, drying black. Stems erect, usually unbranched. Leaves on stem or basal, alternate, lanceolate-linear, pinnatilobate. Inflorescences capitate to spicate, often few flowered. Corolla tube less than 2 × as long as calyx; galea bent at middle, margin densely pubescent; beak horizontal, ± straight, nearly as long as lower lip; lower lip 3-parted nearly to base, lobes stipitate basally.

- Two species: endemic to China.

1a. Corolla yellow, galea pubescent abaxially at apex, except on beak ........................................ 28.


**毛颏马先蒿 mao ke ma xian hao**

Herbs perennial. Stems usually unbranched, with 2 lines of hairs, striate. Leaves mostly basal, sometimes pseudo-rosululate, short petiolate or sessile to ± clasping; leaf blade lanceolate-linear, to 4 × 1.1 cm, abaxially brown pubescent, adaxially whitish pilosulous when young, crenate-pinnatifid, dentate. Inflorescences capitately short racemose; bracts leaflike, densely brown glandular pubescent. Calyx 6–8 mm, tomentose, 5-lobed. Corolla yellow; tube slightly longer than calyx, glabrous or pubescent; galea densely yellow pubescent except for glabrous beak; lower lip deeply 3-parted to base. Filaments glabrous. Capsule to 1 cm × 5 mm. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows, *Picea* forests; 3700–5000 m. Gansu, Qinghai.

1b. Corolla tube glabrous, lower lip ciliate


**毛被毛颏马先蒿 mao bei mao ke ma xian hao**

Corolla tube pubescent; lower lip ciliate.

- Alpine meadows; ca. 2900 m. E Gansu, N Sichuan.


**灰色马先蒿 hui se ma xian hao**

Herbs perennial, 10–28 cm tall. Stems grayish brown pubescent, striate. Leaves short petiolate to sessile, linear or linear-lanceolate, 3–12 cm × 0.5–1.3 cm; segments ca. 30 pairs, ovate-oblong, densely tomentose. Calyx to 1 cm, pubescent, 5-lobed. Corolla white rose; tube ca. 1.2 cm, glabrous; galea glabrous except for long-bearded margin, with purple hairs; lower lip deeply 3-parted nearly to base. Filaments glabrous. Capsule ca. 1.3 cm × 5 mm. Fl. Jul, fr. Jul–Aug.

- Grassy slopes; 4000–4400 m. W Sichuan.


**宫布系 gong bu xi**

Herbs usually more than 30 cm to 1 m tall, drying black. Stems erect, stout. Leaves alternate, sessile, linear or linear-lanceolate, pinnatilobate. Inflorescences spicate. Corolla small; tube slightly longer than calyx; galea very narrow, slightly curved, marginally pubescent; beak bent upward, relatively long, slender; lobes of lower lip narrowly lanceolate.

- Two species: endemic to China.

1a. Calyx 10–13 mm; corolla tube 11–15 mm; beak of galea 7–8 mm, bent upward .................... 30.


**宫布马先蒿 gong bu ma xian hao**

Herbs perennial, pubescent. Stems 30–110 cm tall, branched or not. Leaves linear or linear-lanceolate, 3–12 cm × 2.5–13 mm; segments ca. 30 pairs, ovate,
margin double dentate. Inflorescences 10–50 cm, often interrupted basally, pubescent. Calyx 1–1.3 cm, pubescent; lobes 5, triangular, ± entire. Corolla tube 1.1–1.5 cm, glabrous; galea margin densely long pubescent; beak 7–8 mm; lower lip shorter than galea, 1–1.3 cm × ca. 8 mm, ciliate. Filaments 2 pubescent, 2 glabrous. Fl. Jul, fr. Aug.

• Grasslands at hilltops, open very steep hillsides; ca. 4100 m. SE Xizang.

1a. Calyx tube with conspicuous reticulate veins; lobes of lower corolla lip narrow 30a. var. kongboensis

1b. Calyx tube without conspicuous reticulate veins; lobes of lower corolla lip slightly wide and obtuse

30a. Pedicularis kongboensis var. kongboensis
gong bu ma xian hao (yuan bian zhong)

Calyx tube with conspicuous reticulate veins. Lobes of lower corolla lip narrow.

• Grasslands at hilltops, open very steep hillsides; ca. 4100 m. SE Xizang.

30b. Pedicularis kongboensis var. obtusata

dun lie gong bu ma xian hao

Calyx tube without conspicuous reticulate veins. Lobes of lower corolla lip slightly wide and obtuse.

• SE Xizang.

31. Pedicularis retingensis

lei ding ma xian hao

Herbs perennial. Stems 30–80 cm tall, unbranched, hirsute. Leaves clasping, linear or linear-lanceolate, 5–8 cm × 5–8 mm, base truncate or cordate, subglabrous; segments ca. 30 pairs, triangular-ovate to ovate, margin incised-dentate. Inflorescences 10–30 cm; bracts leaflike, longer than flowers. Calyx 8–10 mm, glabrous; lobes 5, triangular or triangular-lanceolate, entire. Corolla tube ca. 9 mm, glabrous; galea margin densely long pubescent; lower lip shorter than galea, ca. 1 cm × 8 mm. Filaments 2 pubescent, 2 glabrous. Fl. Jul–Aug, fr. Aug–Sep.

• Dry stony hillsides, amidst boulder screes; ca. 4100 m. SC Xizang.

13. Ser. Subsurrectae

Herbs tall, not drying black. Stems branched apically or unbranched. Stem leaves alternate, long petiolate, ovate-lanceolate, large, pinnatifid to pinnatisect; rachis winged; segments remote. Inflorescences long racemose, lax. Calyx small; galea inflated-convex, 3–4 × longer than lower lip, beak curved upward.

One species: China, N Myanmar.

32. Pedicularis vialii

wei shi ma xian hao

Stems to 80 cm tall, ascending, subglabrous. Leaf petiole 2–5 cm, slender, pilose; leaf blade lanceolate-oblung, to 10 × 6 cm, pilose, pinnatisect; segments lanceolate-oblung, dentate. Inflorescences elongating in fruit, to 30 cm, interrupted basally; bracts linear, distal ones shorter than calyx. Calyx 5–6 mm, glabrous; lobes 5, triangular, entire. Corolla whitish, with rose to purple galea, ca. 1 cm; beak of galea ca. 5 mm, slender, curved upward; lower lip ca. 5 mm, not spreading. Filaments glabrous. Capsule lanceolate, ca. 11 × 4.5 mm. Fl. May–Aug, fr. Jul–Sep.

Grassy slopes, coniferous forests; 2700–4300 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].

14. Ser. Excelsae

Herbs tall, not drying black. Stems branched. Leaves alternate, ± ovate, large, usually more than 3.5 cm wide, 3-pinnatifid to pinnatisect. Inflorescences long racemose. Calyx deeply cleft anteriorly. Corolla small; galea with a widened anther case, margin long bearded; beak semicircular, sinistrorse, slender.

Two species: Bhutan, China, Nepal, Sikkim; one species in China.

33. Pedicularis excelsa

zhuo yue ma xian hao

Herbs perennial. Stems 0.9–1.6 m tall. Stems hollow, striate. Leaves withering early basally; petiole 2–6 cm; leaf blade ovate, to 16 × 10 cm, 3-pinnatifid to pinnatisect; segments ovate-lanceolate, margin incised-dentate, apex acute. Inflorescences 6–20 cm; bracts leaflike, ca. 9 mm, shorter than flowers. Pedicel short. Calyx ca. 5 mm; lobes 5, obtuse triangular, less than 1 mm, margin entire. Corolla tube slightly exceeding calyx; beak of galea ca. 1 cm; lower lip ca. 1.8 cm, ciliate. Filaments glabrous. Capsule ovoid-oblung, ca. 4 × as long as calyx, apex obtuse. Fl. Aug, fr. Aug–Sep.

Deep wet humus in shade of broad-leaved forests in lower temperate zone, swamps, dense Rhododendron and Abies forests; 3200–3600 m. S Xizang [Bhutan, C Nepal, Sikkim].

甲拉系  jia la xi
Herbs medium sized, less than 30 cm tall. Stems often many together, erect, unbranched. Leaves alternate, mostly basal, long petiolate, linear to lanceolate or lanceolate-ovate, pinnatifid to pinnatisect. Inflorescences racemose, lax. Calyx cylindric; lobes 3 or 5, unequal. Corolla tube slightly longer than calyx; galea strongly twisted; beak S-shaped, longer than lower lip, slender; galea margin and beak long villous or glabrous; lobes of lower lip short and wide, ± square.

- Two species: endemic to China.

1a. Galea margin bearded; leaf blade pinnatisect; calyx ca. 8 mm, pubescent, 5-lobed ....................... 34. P. kialensis
1b. Galea margin not bearded; leaf blade pinnatifid; calyx ca. 11 mm, sparsely pubescent or subglabrous, 3-lobed .......................... 35. P. streptorhyncha


甲拉马先蒿  jia la ma xian hao
Herbs perennial, to 20 cm tall. Roots slender. Stems often many together, slightly pubescent. Leaves alternate; petiole to 6 cm; leaf blade lanceolate, 14–20 cm, pinnatisect; segments 8–16 pairs, ovate-lanceolate to lanceolate, incised-dentate. Inflorescences interrupted, pubescent; bracts leaflike. Pedicel to 3 mm. Calyx cylindric, ca. 8 mm, deeply cleft anteriorly, pubescent, 5-lobed. Corolla red; tube slightly longer than calyx, glabrous; galea purple, margin bearded; beak bent upward apically, ca. 1 cm; lower lip ciliate. Filaments 2 pubescent, 2 glabrous. Capsule triangular-lanceolate, ca. 1.5 cm. Fl. Jun–Jul, fr. Sep.
- Banks, forests; 3000–4900 m. S Sichuan.


扭喙马先蒿  niu hui ma xian hao
Herbs perennial, 15–30 cm tall, drying black. Rootstock to 30 cm, ± fleshy. Stems 1 to several and clustered, slightly pubescent. Basal leaf petiole to 5.5 cm; leaf blade linear-lanceolate, 2.5–18 × 0.3–2 cm, pinnatifid to pinnatisect; segments 9–28 pairs, triangular-ovate, glabrous except adaxially hispidulous along midvein, margin double dentate. Stem leaves few or absent. Inflorescences to 20 cm; bracts leaflike. Calyx cylindric, ca. 1.1 cm, sparsely pubescent or subglabrous, deeply cleft anteriorly, 3-lobed; posterior lobe smaller, subulate, entire, others larger and serrate. Corolla tube 1.3–1.5 cm, subglabrous; galea margin glabrous; beak to 1.7 cm; lower lip to 1.8 × 2.3 cm. Filaments 2 pubescent, 2 glabrous. Capsule triangular-lanceolate, to 2 cm. Fl. Jul–Aug. fr. Aug.
- Alpine Quercus scrubs, mossy Rhododendron scrubs; 3900–4000 m. NW Sichuan.


红纹系  hong wen xi
Herbs low or tall, drying black or slightly black. Stems erect or ascending, unbranched above. Leaves alternate; basal leaves often numerous, but withering early. Inflorescences racemose or spicate. Flowers medium sized. Corolla tube ± straight; galea 2-toothed near apex, beakless; lower lip erect or slightly spreading.

Four species: North America, NE Asia; two species in China.

1a. Inflorescences dense, long; bracts small, ± entire; calyx lobes ovate-triangular, ± entire; corolla yellow with reddish purple stripes ................................. 36. P. striata
1b. Inflorescences lax, shorter; bracts longer, leaflike; calyx lobes leaflike; corolla yellow, not reddish purple striped ................................. 37. P. mandshurica


红纹马先蒿  hong wen ma xian hao
Herbs perennial, to 1 m tall. Roots stout. Stems erect, branched basally or unbranched, becoming woody when old, initially tomentose, glabrescent. Basal leaves in a rosette; stem leaves many; petiole 1–10 cm; leaf blade lanceolate, to 10 × 3–4 cm, pinnatifid to pinnatisect; segments linear, serrulate. Inflorescences dense, spicate, 6–22 cm; rachis densely pubescent; bracts shorter than flowers, glabrous or ciliate, ± entire. Calyx 1–1.3 cm, sparsely pubescent; lobes 5, unequal, ovate-triangular, ± entire. Corolla yellow with reddish purple stripes, 2.5–3.3 cm; galea falcate, with a distinct tooth on one side of margin; lower lip slightly shorter than galea. Filaments 2 pubescent, 2 glabrous. Capsule
ovoid, 0.9–1.6 cm × 3–6 mm, apex mucronulate. Fl. Jun–Jul, fr. Jul–Aug.

Grassy slopes, *Betula* forests, meadows; 1300–2700 m. S Gansu, Hebei, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi [Mongolia, Russia (Siberia, Far East)].

1a. Rachis of inflorescences, bracts, and calyx not arachnoid-lanate ............... 36a. subsp. *striata*

1b. Rachis of inflorescences, bracts, and calyx arachnoid-lanate ............. 36b. subsp. *arachnoidea*

36a. *Pedicularis striata* subsp. *striata*

红纹马先蒿 (原亚种) hong wen ma xian hao (yuan ya zhong)

Rachis of inflorescences, bracts, and calyx not arachnoid-lanate.

Grassy slopes, *Betula* forests, meadows; 300–2700 m. Hebei, Liaoning, Ningxia, Shaanxi, Shanxi [Mongolia, Russia (Siberia, Far East)].


蛛丝红纹马先蒿 zhu si hong wen ma xian hao


鸡冠子花马先蒿 ji guan zi hua ma xian hao

Herbs perennial, 25–35 cm, drying black. Roots fleshy. Stems erect or ascending, hollow, unbranched, sparsely pubescent, glabrescent when old. Basal leaves numerous; petiole to 6.5 cm; leaf blade ovate-lanceolate to lanceolate, ca. 12 × 2.5–3.5 cm, pinnatipartite to pinnatisect; segments linear-lanceolate, margin double dentate to pinnatisect or dentate. Inflorescences racemose, lax; rachis densely pubescent; bracts leaflike, white tomentose, proximal ones much longer than flowers. Calyx 1.1–1.5 cm, initially tomentose, later glabrescent; lobes 5, leaflike, unequal. Corolla yellow, 2.2–3 cm; galea falcate, beaklike apically, 2-toothed and inconspicuously denticulate; lower lip ca. as long as galea, ciliate. Filaments 2 pubescent, 2 glabrous. Capsule cylindric-lanceolate, 1.2–1.8 cm. Fl. May–Jul, fr. Jul–Aug.

干草草地, 干湿处; ca. 1000 m. Hebei, C and SE Liaoning [Korea].


鼻喙系 bi hui xi

Herbs tall, not drying black. Stems erect, unbranched. Leaves alternate, ± lanceolate, pectinate-pinnatisect; segments linear-lanceolate. Inflorescences long. Calyx lobes short, entire. Corolla tube less than 2 × as long as calyx; galea ± navicular, margin bearded or not; beak short.

Two species: China, Kazakstan, Mongolia, Russia (W Siberia); one species in China.


鼻喙马先蒿 bi hui ma xian hao

Herbs perennial, 45–80 cm, glabrous except for arachnoid-lanate rachis and bracts of inflorescences. Roots short, fibrous. Stems erect, stout. Basal leaves long petiolate, lanceolate, longer than petiole, pinnatisect; segments linear-lanceolate, pinnatisect, serrulate. Inflorescences to 20 cm, dense; bracts linear.

Calyx ovate, 5–6 mm, deeply cleft anteriorly; lobes 5, triangular-lanceolate. Corolla yellow, 1.6–1.7 cm; galea margin long bearded; beak straight; lower lip ca. 9 mm × 1.5 cm. 2 filaments glabrous, 2 pubescent. Capsule obliquely ovoid, 9–10 mm. Fl. Jun–Jul, fr. Jul–Aug. 2n = 16.

Alpine and subalpine meadows. Xinjiang [Kazakstan, Mongolia, Russia (W Siberia)].


绒舌系 rong she xi

Herbs drying black. Stems erect, unbranched. Leaves mostly basal, pinnatisect with lanceolate segments; stem leaves few, alternate, pinnatisect, segments linear. Inflorescences elongated, ± lax basally. Corolla tube less than 2 × as long as calyx; galea pubescent abaxially and at margin; beak well developed, straight, nearly as long as lower lip, slender, with a tuft of hairs at apex.

One species: Bhutan, China, E Nepal, Sikkim.


绒舌马先蒿 rong she ma xian hao

*Pedicularis lachnoglossa* var. *macrantha* Bonati; *P. macrantha* (Bonati) H. Léveillé.

Herbs perennial, 20–50 cm tall. Stems usually 2–5, sometimes to 8, brown pubescent, base with petiolar remnants from preceding years. Leaves clustered at base; petiole 3.5–8 cm; leaf blade lanceolate-linear, to 16 × 1–2.6 cm, pinnatisect; segments 20–40 pairs, lanceolate, pinnatisect or double dentate. Inflorescences racemose, to 20 cm, usually interrupted;
bracts linear, shorter than flowers. Pedicel short. Calyx cylindric-oblong, ca. 1 cm, cleft more deeply anteriorly; lobes 5, ± entire. Corolla purple-rose, ca. 1.6 cm; galea densely red-brown pubescent abaxially and at margin; beak ca. 4 mm; lower lip densely red-brown ciliate.

19. Ser. Recurvae

Herbs medium sized, not drying black. Stems erect or ascending, unbranched. Leaves alternate, long petiolate basally; leaf blades lanceolate-oblong. Inflorescences racemose or spicate. Calyx lobes entire, triangular, ciliate. Corolla red to purple-red; tube barely exceeding calyx; galea strongly bent or falcate, densely villous at base and at margin; beak well developed, bent upward, long; lower lip narrow.

• Three species: endemic to China.

1a. Leaves glabrous; distal bracts linear-lanceolate; calyx ca. 2.5 mm ................................. 40. P. recurva

1b. Leaves densely pubescent abaxially; distal bracts ovate; calyx 3–6 mm.

2a. Leaf petiole ca. 8 cm; leaf blade 2–7 × ca. 3 cm; calyx ca. 3 mm; lobes of lower corolla lip obtuse at apex .................................................................................................................................................................................. 41. P. kangtingensis

2b. Leaf petiole ca. 12 cm; leaf blade to 13 × 5.5 cm; calyx ca. 6 mm; lobes of lower corolla lip acute at apex ........................................................................................................................................................................................................ 42. P. angustilabris

40. Pedicularis recurva

Herbs perennial. Roots clustered, fibrous. Stems ascending, 38–80 cm tall, glabrous and purple tinted basally. Basal leaves withering early. Stem leaves alternate; petiole to 5 cm, distal ones shorter; leaf blade oblong-lanceolate, 3.5–8 × ca. 3 cm, glabrous, pinnatisect; segments 9–11 pairs, ovate to lanceolate, lobulate or double dentate. Inflorescences 5–27 cm, lax; bracts linear-lanceolate, ciliate. Calyx ca. 2.5 × 2 mm, slightly cleft anteriorly; lobes 5, triangular, ± equal, densely ciliate, entire. Corolla pale red; tube ca. 3.5 mm, exceeding calyx; galea strongly bent, apex with several dark purple spots; lobes of lower lip obtuse at apex. Capsule ovoid, ca. 9 × 6.5 mm. Fl. Aug, fr. Aug–Sep.

• Boulders, rock walls; 3300–3400 m. SW Gansu, W Sichuan.

41. Pedicularis kangtingensis

Herbs perennial, 19–39 cm tall. Stems single or sometimes several together, erect, straw colored, tinted with purple to dark purple, glabrous basally. Petiole to 8 cm basally; leaf blade lanceolate-oblong, 2–7 × ca. 3 cm, abaxially densely pale yellow pubescent, pinnatifid to pinnatisect; segments pinnatifid or incised-dentate. Inflorescences racemose, 5.5–11 cm, lax; bracts becoming narrowly ovate upward, margin white villous. Calyx purple-red, ca. 3 mm; lobes 5, triangular, ciliate, entire. Corolla purple-red; tube ca. 3 mm; galea strongly bent, apex with several dark purple spots; lobes of lower lip obtuse at apex. Fl. Jul–Aug, fr. Sep.

• Alpine meadows; ca. 3600 m. W Sichuan.

42. Pedicularis angustilabris

Herbs perennial, 60–70 cm tall. Stems usually several together, glabrous basally. Leaves alternate; petiole ca. 12 cm, distal ones shorter, glabrous; leaf blade oblong to oblong-lanceolate, to 13 × 5.5 cm, abaxially densely pubescent, apex acute, pinnatisect; segments 15–18 pairs, linear-lanceolate to oblong-lanceolate, pinnatifid, dentate. Inflorescences spicate, to 18 cm, ± lax, many flowered; bracts ca. 6 mm, ovate, apex acute. Calyx cylindric-ovate, ca. 6 mm, slightly cleft anteriorly; lobes 5, triangular, ± equal, densely ciliate. Corolla purple-red, ca. 1.5 cm; tube barely exceeding calyx, glabrous; galea strongly bent, apex with several dark purple spots; lobes of lower lip acute at apex. Fl. Jul, fr. Aug–Sep.

• Alpine meadows; 3000–4000 m. W Sichuan, NW Yunnan.

20. Ser. Hirtellae

Herbs perennial, 60–70 cm tall. Stems usually several together, glabrous basally. Leaves alternate; petiole ca. 12 cm, distal ones shorter, glabrous; leaf blade oblong to oblong-lanceolate, to 13 × 5.5 cm, abaxially densely pubescent, apex acute, pinnatisect; segments 15–18 pairs, linear-lanceolate to oblong-lanceolate, pinnatifid, dentate. Inflorescences spicate, to 18 cm, ± lax, many flowered; bracts ca. 6 mm, ovate, apex acute. Calyx cylindric-ovate, ca. 6 mm, slightly cleft anteriorly; lobes 5, triangular, ± equal, densely ciliate. Corolla purple-red, ca. 1.5 cm; tube barely exceeding calyx, glabrous; galea strongly bent, apex with several dark purple spots; lobes of lower lip acute at apex. Fl. Jul, fr. Aug–Sep.

• Alpine meadows; 3000–4000 m. W Sichuan, NW Yunnan.


Alpine meadows, Abies forests, among small shrubs on hillsides; 2500–5400 m. W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, E Nepal, Sikkim].

Alpine meadows, Abies forests, among small shrubs on hillsides; 2500–5400 m. W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, E Nepal, Sikkim].
Herbs reddish or reddish brown hirtellous, drying black. Stems single, unbranched. Basal leaves persistent; stem leaves alternate, short petiolate, less than 12 cm, pinnatifid. Inflorescences spicate. Corolla tube straight, erect; galea pubescent abaxially, 2-toothed at apex; lower lip not spreading.

- One species: endemic to China.


粗毛马先蒿 cu mao ma xian hao

Herbs biennial, 20–50 cm tall, reddish brown hirtellous, sometimes glandular pubescent. Stems erect, rigid, unbranched, with 1 or 2 lines of dense glandular hairs. Basal leaves large; petiole 4–10 mm; leaf blade ovate-oblong to lanceolate-oblong, to 5 × 2–2.5 cm, abaxially densely long pubescent along veins, adaxially long pubescent; segments 9–15 pairs, ovate to ovate-lanceolate, dentate. Stem leaves smaller than basal leaves, ± sessile. Inflorescences spicate, 7–14 cm, often interrupted basally; bracts leaflike. Calyx cylindric, ca. 1 cm, glandular pubescent; lobes 5, linear-oblong, ± equal. Corolla white to rose, to 3 cm, glandular pubescent; tube ca. 2 × as long as calyx; galea ca. 1–1.1 cm, falcate, distinctly subulate-dentate at apex; lower lip shorter than galea, lobes rounded, ± equal, ciliate. Filaments glabrous. Fl. Aug–Sep, fr. Sep–Oct.

- Open stony pastures, thickets; 2800–3700 m. NW Yunnan.


丹参花系 dan shen hua xi

Herbs tall. Roots glabrous. Stems many branched; branches and leaves opposite. Leaves ± ovate, pinnatipartite to pinnatisect. Inflorescences racemose, lax. Corolla 3–3.5 cm; galea falcate or slightly falcate, beakless, toothless; lower lip ca. as long as galea.

- One species: endemic to China.


丹参花马先蒿 dan shen hua ma xian hao

Herbs perennial, to 1.3 m tall, not drying black. Stems erect, often woody basally; branches spreading, slender, often somewhat repent, pubescent. Petiole to 1.5 cm; leaf blade ovate to oblong-lanceolate, to 7 × 3.5 cm, densely pubescent, pinnatipartite to pinnatisect; segments 10–14 pairs, ovate-lanceolate to oblong, serrate. Inflorescences to 25 cm. Pedicel slender, pubescent. Calyx 1–1.5 cm, cleft anteriorly to 2/5 length, densely glandular pubescent; lobes 5, ± equal, serrate. Corolla rose to red, 3.3–5 cm, sparsely pubescent; tube 1.4–2.4 cm; galea ca. as long as lower lip, falcate, villous near apex; lower lip 1.5–2 cm, lobes rounded. Filaments glabrous. Capsule globose. Fl. Aug–Sep, fr. Oct–Nov.

- Grassy slopes, forests; 2000–3900 m. Sichuan, NW Yunnan.

**44a. Pedicularis salviiflora** var. **salviiflora** 丹参花马先蒿(原变种) dan shen hua ma xian hao (yuan bian zhong)

Capsule densely pubescent.

- Grassy slopes, forests; 2000–3900 m. W Sichuan, NW Yunnan.


滑果丹参马先蒿 hua guo dan shen ma xian hao

Capsule glabrous.

- Picea asperata forests, slopes; ca. 3300 m. Sichuan.


山萝花系 shan luo hua xi

Herbs annual, robust. Stems rigid, erect, usually branched apically. Leaves whorled, pinnatisect. Inflorescences racemose. Calyx lobes 5, ± leaflike, serrate. Corolla tube slightly curved; galea with a very short beak at apex and 1 tooth on each side of margin.

- Three species: endemic to China.

1a. Corolla 2.1–2.6 cm; middle lobe of lower lip ovate ................................................................. 45. **P. floribunda**

1b. Corolla to 2.1 cm; middle lobe of lower lip rounded.

2a. Galea slightly bowed, ca. as long as tube, crested; corolla 1.8–2.1 cm; lower lip 9–11.5 mm wide; filaments 2 pubescent ................................................................. 46. **P. pseudomelampyriflora**
2b. Galea straight, ca. 1/2 as long as tube, not crested; corolla ca. 1.6 cm; lower lip barely 7.5 mm wide; filaments glabrous ................................ ................................ ........................................... 47. *P. melampyriflora*


多花马先蒿  duo hua ma xian hao

Herbs annual, to 50–70 cm tall, not drying black. Stems branched apically, with 3 or 4 lines of hairs. Leaves in whorls of 3–6; petiole to 1.2 cm; leaf blade lanceolate-oblong, 2.5–4.5 x 0.8–1.5 cm, sparsely pubescent, pinnatisect; segments 10–18 pairs, ovate to lanceolate, pinnatifid, incised-dentate. Inflorescences to 20 cm, lax; bracts leaflike. Pedicel 4–5 mm. Calyx 4.5–6.5 mm, densely villous along 5 veins; lobes 5, unequal, serrate. Corolla rose, 2.1–2.6 cm; tube 1.1–1.5 cm, ± straight in calyx; galea falcate, crested; lower lip 1.2–1.4 x 0.9–1.15 cm, middle lobe ovate, projecting. Filaments pubescent. Fl. Jul, fr. Aug–Sep.

• Rocky slopes; 2300–2700 m. W Sichuan.


假山萝花马先蒿  jia shan luo hua ma xian hao

Herbs annual, to more than 60 cm tall, drying black. Stems single, ± woody when old, many branched apically; branches in whorls of 3 or 4, slender, with lines of hairs. Leaves in whorls of 3–6; petiole short; leaf blade ovate-oblong to lanceolate-oblong, 2.5–4.5 x 1.5 cm, abaxially pubescent along midvein, pinnatifid to pinnatisect; segments linear, serrate. Inflorescences with flowers in whorls in ± interrupted racemes; bracts leaflike, shorter than flowers, densely white villous. Pedicel short. Calyx ca. 4 mm, sparsely villous; lobes 5, unequal, serrate. Corolla rose, 1.8–2.1 cm; tube nearly as long as galea, strongly curved in calyx; galea falcate, ca. as long as tube, crested; lower lip 0.9–1.2 x 0.9–1.2 cm, middle lobe rounded. Filaments 2 pubescent, 2 glabrous. Fl. Jun–Aug, fr. Sep–Oct.

• Open moist areas, thicket margins; 3000–3800 m. NW Sichuan, SE Xizang, NW Yunnan.


山萝花马先蒿  shan luo hua ma xian hao

Herbs annual, to 1 m tall, drying black. Stems woody when old, many branched; branches in whorls of 3–6, with lines of hairs. Leaves in whorls of 3–6; petiole to 1.2 cm; leaf blade lanceolate-oblong, to 8 cm, pinnatisect; segments 7–11 pairs, lanceolate to narrowly lanceolate, abaxially subglabrous, adaxially sparsely pubescent, pinnatifid or incised-double dentate. Inflorescences to 20 cm, lax, interrupted; bracts leaflike, longer than flowers or distal ones ca. as long as flowers. Pedicel ca. 3 mm. Calyx ca. 6 mm; lobes 5, unequal, pubescent. Corolla rose to purple, barely 1.6 cm; tube nearly as long as galea; galea falcate, ca. 1/2 as long as tube, not crested; lower lip ca. 6 x 7.5 mm, middle lobe rounded. Filaments glabrous. Fl. Jul–Aug, fr. Sep–Oct.

• Slopes, open forests; 2700–3600 m. SW Sichuan, NW Yunnan.


长茎系  chang jing xi

Stems soft, long, ± diffuse, branches many, long, curved, whorled. Stem leaves in whorls of 3 or 4, pinnatisect or pinnatifid. Flowers axillary or racemose. Calyx lobes 5, dentate. Corolla small; tube decurved in throat of calyx tube; galea beak distinct, shorter than anther-containing part of galea; middle lobe of lower lip smaller than lateral lobes, apex hoodlike, acute or acuminate.

• Two species: endemic to China.

1a. Corolla yellow, ca. 1.5 cm; beak of galea short, scarcely 1.5 mm ................................. 48. *P. dielsiana*

1b. Corolla purple-red, 1.8–2.2 cm; beak of galea 2.5–3.5 mm  ........................................... 49. *P. longicaulis*


第氏马先蒿  di shi ma xian hao

Herbs annual, to 90 cm tall, not drying black. Stems single, purplish black, rigid; branches in whorls of 3 or 4, slender, with 4 lines of hairs. Leaves often in whorls of 4; petiole ca. 5 mm; leaf blade oblong to ovate-oblong, 2–3.5 x 1–1.5 cm, abaxially subglabrous, adaxially sparsely pubescent, pinnatisect to pinnatifid; segments linear to oblong, incised-double dentate. Pedicel short. Calyx 7–8 mm, glabrous; lobes 5, unequal, posterior lobe triangular and ± entire; lateral lobes larger, ovate, serrate. Corolla yellow, ca. 1.5 cm; tube slightly longer than galea; galea falcate apically; beak 1–1.5 mm; lower lip ca. as long as galea, apex of middle lobe acuminate. Filaments glabrous. Fl. Aug, fr. Sep–Oct.

• Meadows, grassy slopes; 2000–2500 m. W Hubei, C Sichuan.


长茎马先蒿  chang jing ma xian hao
Herbs annual or perennial, to more than 1 m tall, drying black. Stems hollow, striate, with lines of hairs; branches in whorls of 3 or 4, soft, curved. Leaves opposite or in whorls of usually 3 or 4; petiole short, villous; leaf blade oblong-lanceolate, 2–4 × 1–2 cm, adaxially glandular pubescent, pinnatifid to pinnatisect; segments 10–14 pairs, linear, incised-double dentate, teeth callose. Inflorescences long racemose, terminal, to 20 cm, interrupted; bracts leaflike. Pedicel short. Calyx 8–9 mm, villous; lobes 5, unequal, serrate. Corolla purple-red, 1.8–2.2 cm; tube ca. 7 mm, slightly curved in calyx; galea strongly bent at apex; beak straight, 2.5–3.5 mm; lower lip longer than galea, to 1.1–1.2 × ca. 1 cm, middle lobe lanceolate, apex acute. Filaments glabrous. Fl. Aug–Sep, fr. Sep–Oct.

1a. Calyx ca. 3 mm; corolla tube ca. 6 mm, galea crested, middle lobe of lower lip hoodlike .......... 50. Pedicularis ramosissima
1b. Calyx 5–7 mm; corolla tube 7–8 mm, galea not crested, middle lobe of lower lip not hoodlike ...... 51. Pedicularis gracilis

多枝马先蒿 duo zhi ma xian hao
Herbs annual, to 50 cm tall, mostly branched; branches slender, opposite basally, in whorls of 3 apically. Leaf blade oblong-lanceolate, glabrous, pinnatisect; segments pinnatifid, margin double dentate. Flowers opposite or in whorls of 3, interrupted; bracts leaflike. Calyx ca. 3 mm, rounded, membranous; lobes 5, unequal. Corolla purple; tube ca. 6 mm; galea ± falcate, slender. Capsule ca. 1/2 exceeding calyx or enclosed in accrescent calyx.


1b. Calyx lobes entire .................... 51a. subsp. gracilis
1b. Calyx lobes serrate.
2a. Capsule to 11 mm ..... 51b. subsp. macrocarpa
2b. Capsule barely 8 mm ...... 51c. subsp. sinensis

Calyx lobes entire. Fl. Aug.

Herbs annual, more than 1 m tall, drying black. Stems with 3 or 4 lines of hairs, many branched; branches in whorls of 4–6. Basal leaves withering early; stem leaves in whorls of 3 or 4, ± sessile; leaf blade ovate-oblong, 2.5–3.5 × 1–1.5 cm, abaxially glabrescent, adaxially pubescent along midvein, pinnatisect; segments 6–9 pairs, oblong, incised-dentate. Inflorescences racemose, interrupted; bracts leaflike. Calyx cylindric, 5–7 × 1–2 mm, pubescent along midvein; lobes 5, entire or serrate. Corolla purplish pink, 1.2–1.5 cm; tube straight, 7–8 mm; galea bent at a right angle apically, not crested; beak 4–5.5 mm; lower lip 7–10 mm wide, glabrous, middle lobe not hoodlike.
Herbs tall. Stems branched apically; branches short, ascending; branches and leaves often in whorls of 3–5. Leaves small, pinnatisect. Inflorescences compact racemes. Flowers scarcely 6 mm. Corolla small; tube ca. as long as calyx; beak slender; middle lobe of lower lip hoodlike at apex.

• One species: endemic to China.

结球马先蒿 jie qiu ma xian hao
Herbs annual, to more than 60 cm tall, drying black. Branches whorled, short, slender. Leaves in whorls of 4 or 5; petiole short; leaf blade ± oblong, ca. 2.5 × 1 cm, pinnatisect; segments more than 10 pairs, oblong-linear, pinnatifid, incised-double dentate. Bracts linear. Calyx tubular, ca. 4.5 mm; lobes 5, ± equal, serrate, glabrous. Corolla purple, ca. 6 mm, glabrous; tube erect, barely as long as calyx; galea bent at a right angle, prolonged into a beak apically; beak straight, ca. 5.5 mm, slender; lower lip ca. 3.5 × 3 mm, middle lobe smaller than lateral lobes, narrowly ovate. Filaments glabrous.

• W Hubei.

阿洛系 a luo xi
Herbs not or slightly drying black. Rhizomes absent; roots densely yellowish brown pubescent. Stems and branches slender. Branches and leaves opposite or occasionally alternate. Stem leaves ovate, rarely ovate-lanceolate. Calyx lobes 5, entire. Corolla less than 2 cm; galea ± straight to falcate, toothless, beakless; lower lip much shorter than to nearly as long as galea. Anthers acuminate.

Seven species: China, Myanmar, Sikkim; five species in China.

1a. Corolla tube more than 2 × as long as galea; stems strongly woody, densely pubescent ............... 57. P. petelotii
1b. Corolla tube ca. as long as galea; stems herbaceous or becoming woody when old, striate, subglabrous.

2a. Corolla rose; lower lip nearly as long as galea .................................................. 56. P. legendrei
2b. Corolla ± yellow; lower lip much shorter than galea.

3a. Corolla tube ca. 2 mm in diam.; filaments glabrous .................................................. 55. P. wardii
3b. Corolla tube ca. 4 mm in diam.; filaments slightly pubescent.

4a. Leaves ca. 7 cm, segments 5–7 pairs; lower corolla lip 3–5 mm ........................................ 53. P. aurata
4b. Leaves ca. 5 cm, segments 4 or 5 pairs; lower corolla lip ca. 2.5 mm ......................... 54. P. aloensis

金黄马先蒿 jin huang ma xian hao
Herbs perennial, to 30 cm tall, not drying black. Stems often branched apically, herbaceous, striate, glabrescent. Leaves opposite or occasionally alternate; petiole to 4 cm; leaf blade ovate to ovate-lanceolate, ca. 7 cm, glabrous, pinnatisect; segments 5–7 pairs, oblong-lanceolate to ovate, pinnatifid, incised-dentate. Flowers axillary, scattered; bracts leaflike. Pedicel short. Calyx usually tinged with red, 3.5–4 mm; lobes 5, triangular. Corolla yellow, ca. 1.3 cm, nearly 2 × as long as calyx; tube ca. as long as galea, ca. 4 mm in diam.; galea ± straight or slightly falcate, apex entire; lower lip 3–5 mm, much shorter than galea, middle lobe obovate, apex emarginate. Filaments slightly pubescent. Capsule obliquely triangular-lanceolate, to 0.9–1.1 cm, short apiculate. Fl. Jul, fr. Jul–Aug.

• Bamboo thickets, forests; 3000–4000 m. NW Yunnan.

华氏马先蒿 hua shi ma xian hao
Herbs perennial. Stems numerous, ascending, 6–10 cm tall, ± branched apically, glabrous, ± woody basally. Leaves opposite; proximal petioles 1–2 cm, distal ones 5–10 mm; leaf blade ovate, glabrous or sparsely ciliate, pinnatisect; segments 5 or 6 pairs, ovate-oblong.
pinnatifid, incised-dentate. Flowers axillary, scattered; bracts linear. Pedicel 1–2 mm, glabrous. Calyx membranous, ca. 4 mm, slightly cleft anteriorly; lobes 5, lanceolate-linear, ca. 1 mm, ciliate. Corolla yellowish white; tube erect, much exceeding calyx, ca. 8 mm, ca. 2 mm in diam.; galea falcate, ca. as long as tube, apex entire, obtuse; lower lip 2–2.5 mm, much shorter than calyx, ciliate, middle lobe rounded, apex emarginate. Calyx membranous, ca. 4 mm, slightly cleft anteriorly; lobes 5, lanceolate-linear, ca. 1 mm, ciliate. Corolla yellowish white; tube erect, much exceeding calyx, ca. 8 mm, ca. 2 mm in diam.; galea falcate, ca. as long as tube, apex entire, obtuse; lower lip 2–2.5 mm, much shorter than calyx, ciliate, middle lobe rounded, apex emarginate. Filaments glabrous. Fl. Jul, fr. Aug.


勒氏马先蒿 le shi ma xian hao
Herbs annual to biennial, to more than 40 cm tall, ± drying black. Stems many branched, glabrous, slightly woody when old. Leaves opposite; petiole ca. 2.5 cm; leaf blade ovate-oblong, to 5.5 cm, abaxially glabrous, adaxially sparsely hispidulous, pinnatisect to pinnatipartite; segments 4–9 pairs, pinnatifid to double dentate, incised-dentate. Flowers axillary, scattered. Pedicel very short. Calyx 2.5–3 mm; lobes 5, very short, unequal. Corolla rose, ca. 1.7 cm; tube ca. 9 mm, expanded apically, glandular pubescent; galea 8.5–9 mm, slightly falcate, densely pubescent abaxially, margin densely long pubescent near apex, apex entire; lower lip nearly as long as galea, long ciliate. Filaments 2 pubescent, 2 glabrous. Fl. Aug, fr. Sep.


裴氏马先蒿 pei shi ma xian hao
Herbs annual, stout, drying black. Stems many branched, strongly woody, densely brown tomentose. Leaves opposite; petiole ca. 3 cm, sparsely long pubescent; leaf blade broadly ovate, ca. 3 × 3 cm, pinnatisect; segments 2–5 pairs, elliptic to oblong-lanceolate, pinnatisect, linear-oblong, pinnatifoliate or incised-dentate. Flowers solitary in distal leaf axils. Pedicel ca. 3 mm. Calyx ca. 5.5 mm, distinctly cleft anteriorly; lobes 5, triangular, small. Corolla tube to 1.7 cm, more than 2 × as long as galea, glabrous; galea slightly falcate; lower lip ca. 6 mm, long ciliate. Filaments 2 pubescent, 2 glabrous. Capsule triangular-lanceolate, ca. 1 cm × 2.5 mm, apex acute. Fl. Jul, fr. Jul-Aug.


穆坪马先蒿 mu ping ma xian hao
Herbs perennial, to 60 cm tall or more, drying black. Stems 1 to several, hollow, pubescent, shallowly striate; branches often in whorls of 4. Petiole of basal leaves to 9 cm, subglabrous; leaf blade to 12 × 5.5 cm, membranous; segments 8–20 pairs, ovate to linear-oblong, margin double dentate, apex acute. Stems herbaceous, erect, many branched; branches opposite or in whorls of 4, slender. Leaves lanceolate to oblong-lanceolate, pinnatisect to pinnatipartite. Inflorescences racemose. Calyx cleft anteriorly; lobes 5, triangular, often entire. Corolla purple; beak longer than anther-containing part of galea, bent upward, slender. Capsule 4/5 exceeding calyx.


曲茎系 qu jing xi
Stems numerous, more than 40 cm tall, usually flexuous and ascending, branched basally or unbranched; branches and leaves opposite. Leaves ovate-lanceolate or oblong, pinnatisect. Inflorescences racemose. Calyx cleft anteriorly; lobes 5, narrowly triangular, often entire. Corolla purple; tube longer than calyx; galea bent at a right angle apically; beak ca. 7 mm; lower lip ca. 1.4 cm, ciliate. Filaments pubescent. Capsule ovoid-lanceolate, ca. 9 × 3.5 cm. Fl. Aug, fr. Aug–Sep.


曲茎马先蒿 qu jing ma xian hao
Herbs perennial, low or to 40 cm tall, pubescent. Stems flexuous, striate apically. Leaves opposite; petiole 1.5–6 cm, pubescent; leaf blade ovate-oblong, to 5 × 2.5 cm; segments 8–14 pairs, oblong, pinnatisect to pinnatipartite, dentate, teeth callose. Flowers interrupted basally; bracts leaflike. Calyx cylindric-campanulate, 8–9 mm, villous; lobes 5, unequal, posterior one triangular and entire, lateral ones larger, serrate. Corolla tube 1.8–2.2 cm, pilose; galea falcate; beak bent downward, straight; lower lip ovate-rounded, middle lobe much smaller than lateral lobes. Filaments 2

Herbs low, ± stemless. Leaves alternate; petiole long; lanceolate to oblong-lanceolate, pinnatisect. Flowers axillary; pedicel long. Corolla large; galea falcate, lacking marginal teeth, apex usually acute, beakless.

Three species: N Asia, Europe; one species in China.


无茎系 wu jing xi

Herbs perennial, 3–6 cm tall, drying slightly black. Roots fleshy. Stems 1 to several together, delicate, enveloped in lanceolate to ovate, membranous scales and marcescent petioles, pubescent. Petiole 5.5–9 cm, delicate, diffuse, densely tomentose; leaf blade oblong-lanceolate, 7–10 × 2–2.5 cm, abaxially rust colored hispidulous along veins, adaxially sparsely long pubescent; segments 8–14 pairs, ovate, pinnatifid, incised-dentate. Pedicel to 10 cm, slender, curved, villous. Calyx 1.2–1.8 cm; lobes 5, ± equal, leaflike. Corolla purple, 3–4 cm; tube erect, slightly longer than to 1.5 × as long as calyx; galea ca. 1.3 cm, apex acute or obtuse; lower lip slightly longer than galea, lobes rounded, ± equal. Filaments pubescent. Capsule completely enclosed by calyx, ovoid, ca. 1.3 cm. Fl. May, fr. Jul–Aug.

- Moist places, rocky slopes, forests; 1000–2800 m. Hebei, Hubei, Shaanxi, Shanxi, NE Sichuan.

60a. Pedicularis artselaeri var. artselaeri 埃氏马先蒿(原变种) ai shi ma xian hao (yuan bian zhong)
Pedicel to 6.5 cm. Apex of galea acute; lobes of lower corolla lip not sinuate.

60b. Pedicularis artselaeri var. wutaiensis 五台埃氏马先蒿 wu tai ai shi ma xian hao
Pedicel to 10 cm. Apex of galea obtuse; lobes of lower corolla lip sinuate.


蔓生系 man sheng xi


- Forest understories, shaded wet paths, thickets; 900–2200 m. Sichuan.


稻城马先蒿 dao cheng ma xian hao

Herbs perennial, ca. 15 cm tall, drying black. Stems usually 3–5 together, scarcely 1 cm, or plants stemless. Leaves nearly all basal, numerous; petiole 5–7 cm, sparsely villous; leaf blade oblong to lanceolate-oblong, 10–14 cm, abaxially white tomentose along veins, adaxially subglabrous, pinnatisect; segments 12–15 pairs, oblong, margin double dentate. Flowers nearly all basal. Pedicel 2–3 cm, slender. Calyx cylindric, ca. 2 cm, cleft anteriorly to 1/3 of tube; lobes 5, distinctly unequal. Corolla pink, ca. 4 cm; tube ca. 2.2 cm, slightly expanded apically; galea slightly falcate; beak 2–3 mm, slender; lower lip ca. 1.8 × 2–2.5 cm, ciliate. Filaments glabrous. Capsule completely enclosed by...
cylindric, ca. 6 mm, slightly cleft anteriorly; lobes 5, gating to 2.5 cm, becoming curved. Calyx turbinate-incised-dentate. Pedicel erect at anthesis, later elongating to 2.5 cm, becoming curved. Calyx turbinate-cylindric, ca. 6 mm, slightly cleft anteriorly; lobes 5, incised-dentate. Corolla purple or greenish white; tube erect, ca. 2 × as long as calyx, glabrous; galea bent at a right angle; beak bent slightly downward, slender; lower lip ca. 8 mm, ciliate. Filaments glabrous. Capsule compressed, ovoid, ca. 8 × 6.5 mm, apex acuminate. Fl. Jul–Aug, fr. Jul–Sep.


长梗马先蒿 chang geng ma xian hao
Herbs perennial, low, barely 10 cm tall, ± stemless, delicate, not drying black. Stems 3–4 cm, leafy, occasionally few branched. Leaves alternate; petiole to 3–6 cm; leaf blade oblong to oblong-lanceolate, to 7 × 2.5 cm, pinnatisect; segments 4–9 pairs, oblong-lanceolate, pinnatisect, incised-dentate. Flowers few. Pedicel curved, 1.5–6 cm, slender. Calyx turbinate-campanulate, ca. 6.5 mm, slightly cleft anteriorly; lobes 5, lanceolate-linear, ± entire to obscurely dentate. Corolla rose, ca. 1.6 cm; tube more than 2 × as long as calyx; galea ca. 9 mm, ± bent at a right angle; beak straight, slender; lower lip ca. 1.1 × 1.4 cm, middle lobe rounded, smaller than lateral lobes, ciliate. Filaments glabrous. Fl. Jul–Aug, fr. Sep.

• Moist Abies forests; 3400–4100 m. NW and W Sichuan.


腋花马先蒿 ye hua ma xian hao
Pedicularis heterophylla Bonati; P. lacerata Bonati. Herbs perennial, weak, often procumbent, drying black. Stems 2 or more together, usually branched basally; branches very slender, repent or ascending, sparsely pubescent. Leaves mostly opposite; petiole to 2.5 cm; leaf blade elliptic-lanceolate, to 8 × 3 cm, pinnatisect; segments 5–12 pairs, pinnatipartite to pinnatifid, incised-dentate. Pedicel erect at anthesis, later elongating to 2.5 cm, becoming curved. Calyx turbinate-cylindric, ca. 6 mm, slightly cleft anteriorly; lobes 5, incised-dentate. Corolla purple or greenish white; tube erect, ca. 2 × as long as calyx, glabrous; galea bent at a right angle; beak bent slightly downward, slender; lower lip ca. 8 mm, ciliate. Filaments glabrous. Capsule compressed, ovoid, ca. 8 × 6.5 mm, apex acuminate. Fl. Jul–Aug, fr. Jul–Sep.

• Moist and open pastures, shaded damp places in forests and thickets, open rock crevices; 2700–4000 m. SW Sichuan, SE Xizang, NW Yunnan.

1a. Plants small; petiole short; corolla purple

64a. subsp. axillaris

腋花马先蒿(原亚种) ye hua ma xian hao (yuán yà zhòng)


• Open pastures: 2700–3400 m. NW Yunnan.

Herbs perennial, not drying black. Stems few, ± flexuously ascending, unbranched, or sometimes with long repent branches. Leaves mostly alternate, glabrous; petiole to 2.8 cm; leaf blade oblong-lanceolate to oblanceolate, to 10 × 2–3.5 cm, abaxially subglabrous, adaxially slightly pubescent along midvein, pinnatisect; segments 6–12 pairs, often pinnatipartite, ovate-oblong to ovate-lanceolate, incised-dentate. Pedicel 1–1.5 cm. Calyx tube 4–4.5 mm, slightly cleft anteriorly; lobes 5, unequal, serrate. Corolla pink; tube ca. 8 mm; galea strongly curved, scarcely 5 mm; beak bent slightly downward, ca. 3 mm, slender; lower lip to 1.3 cm, nearly 2 × as long as galea, middle lobe broadly ovate, apex hoodlike. Filaments 2 pubescent, 2 glabrous. Capsule ovoid, compressed, mucronate. Fl. Jun–Jul. fr. Jul–Aug.

- Moist places; 2500–3300 m. E Sichuan.


焊菜叶马先蒿 han caï ye ma xian hao
Herbs perennial, not drying black. Stems usually single, dichotomously branched or unbranched, weak, repent, subglabrous. Leaves ± opposite; petiole 1–5 cm, slightly long pubescent; leaf blade ovate to oblong, to 9 × 3–5 cm, membranous, abaxially subglabrous, adaxially slightly hirtellous, pinnatisect; segments 2–7 pairs, broadly ovate, ± pinnatiform, margin double dentate. Pedicel slender, 8–20 cm, subglabrous. Calyx cylindric-obconical, ca. 7 mm, slightly cleft anteriorly; lobes 5, slightly unequal, leaflike, glabrous apically, sparsely white villous along midvein at base. Corolla rose; tube less than 2 × as long as calyx, ca. 1.2 cm; lower lip large, slightly ciliate, middle lobe narrowly ovate, apex acute. Filaments 2 pubescent, 2 glabrous. Fl. Jun–Jul, fr. Jul–Aug.

- Moist places, forests; ca. 2000 m. W Hubei, Shaanxi, E Sichuan.


羊齿叶马先蒿 yang chi ye ma xian hao
Herbs perennial, not drying black. Stems several together, to 50 cm, weak, repent, ± woody at base with age, internodes to 4–7 cm, with 2 lines of hairs. Leaves nearly all opposite; petiole to 3.5 cm, glabrous; leaf blade elliptic, 4.5–5 × 2.5–3 cm, abaxially glabrous, adaxially slightly pubescent, pinnatisect; segments 3–5 pairs, ovate to ovate-oblong, incised-double dentate. Pedicel slender, ca. 1.5 cm, glabrous. Calyx tube 6–7.5 mm, subglabrous, slightly cleft anteriorly; lobes 5, distinctly unequal, posterior one smallest. Corolla purple-red, 1.8–2.4 cm; tube erect, 0.8–1.4 cm; galea ca. 1 cm; beak bent upward, to 5 mm, slender; lower lip longer than galea, ca. 1.2 cm × 8 mm, middle lobe rounded. Filaments glabrous. Fl. Jul–Aug, fr. Aug–Sep.

- Forests; 1400–1500 m. W Hubei.


膜叶马先蒿 mo ye ma xian hao
Herbs perennial, not drying black. Stems often several together, more than 60 cm, repent, densely gray-brown pubescent basally. Leaves alternate or ± opposite at branches; petiole to 7.5 cm; leaf blade ovate-elliptic to lanceolate-oblong, 1.5–10 × ca. 4.5 cm, membranous, abaxially glabrous, adaxially slightly hirtellous, pinnatisect; segments 4–8 pairs, ovate to ovate-oblong, pinnatifid or incised-double dentate. Pedicel 0.8–1.5 cm. Calyx 5–8 mm, slightly cleft anteriorly; lobes 5, equal or unequal. Corolla purple, to 1.5 cm; tube erect, nearly 1.5 × as long as calyx; galea bent at a right angle apically; beak straight, ca. 4 mm, slender; lower lip to 1.2 cm, middle lobe acute at apex. Filaments glabrous. Capsule enclosed by calyx, compressed, ovoid, to 7 × 5 mm, very oblique, mucronate. Fl. Aug, fr. Aug–Sep.

- Forests, rocky slopes; 2200–2400 m. WC Sichuan.


鹰嘴马先蒿 ying zui ma xian hao
Herbs perennial. Stems numerous, 20–30 cm, procumbent, slightly branched or unbranched, subglabrous, leafy. Stem leaves alternate; petiole ca. 1 cm, glabrous; leaf blade ovate-elliptic, 1–3 cm, slightly hispid, pinnatisect; segments 6–8 pairs, lanceolate, pinnatifid, apex acute. Flowers remotely arranged; bracts leaflike, nearly as long as flowers. Pedicel ± curved, slender, ca. 2 cm. Calyx ± spathelike, cleft to middle of tube anteriorly; tube ca. 5 mm, membranous; lobes 5, equal, apex flabellate, 3–6 mm. Corolla purple, small; tube shorter than calyx; galea erect, strongly curved apically, longer than tube, with a pair of teeth at throat; beak horizontal, 5–6 mm, slender; lower lip ca. as long as galea, ca. 7 mm × 1.5 cm, middle lobe rounded. Filaments villous.

- Yunnan.


孱弱系 chan ruo xi
Roots fascicled, slender. Stems soft, fleshy, ± erect, flexuous or procumbent. Leaves alternate or subopposite. Basal leaves few, long petiolate; stem leaves alternate or pseudo-opposite, smaller than basal leaves, with distinct reticulate veins abaxially, pinnatipartite to pinnatisect. Calyx tube with distinct reticulate veins apically. Flowers several, axillary, widely spaced. Corolla tube less than 2 × as long as calyx; galea beaked.

- One species: endemic to China.

Herbs perennial, to 11 cm tall. Roots fleshy. Stems numerous, weak, flexuous ascending, or ± procumbent, pubescent. Leaves alternate or ± opposite. Petiole of basal leaves to 7 cm, glabrous; leaf blade ovate-oblong, 5.5–13 × ca. 2.5 cm, pinnatisect; segments 6 or 7 pairs, ovate to oblong, pinnatifid to pinnatisect, membranous, glabrous, dentate. Stem leaves similar to basal leaves, but smaller and shorter petiolate. Inflorescences racemose, 8–9 cm, interrupted basally; bracts leaflike, proximal ones longer than flowers.

Inflorescences racemose, 8–9 cm, interrupted basally; bracts leaflike, proximal ones longer than flowers, distal ones ca. as long as flowers. Pedicel erect, ca. 1.3 cm, pubescent. Calyx 1–1.2 cm, villous, slightly cleft anteriorly; lobes 5, unequal, leaflike. Corolla purple, ca. 2 cm; tube erect, longer than calyx, slightly pubescent; galea falcate; beak straight, conical, ca. 3 mm; lower lip slightly longer than galea, ciliate. Filaments villous. Capsule enclosed by accrescent calyx, compressed, ovoid, to 1 cm × 7–8 mm, apex acute. Fl. and fr. Sep.

Open and sandy places; ca. 3000 m. NW Yunnan.

33. Ser. Omiianae


峨眉系 e mei xi

Plants herbaceous. Stems often ascending to decumbent. Basal leaves long petiolate, lanceolate to elliptic, pinnatisect; segments ovate to oblong; stem leaves often pseudo-opposite. Flowers axillary, pedicellate. Calyx lobes 5. Corolla tube more than 4 × as long as calyx; beak bent upward, slender.

One species: endemic to China.


峨眉马先蒿 e mei ma xian hao

Herbs perennial, drying black. Stems usually several to–together, erect, ascending to decumbent or procumbent, densely pubescent. Basal leaves numerous; petiole to 9 cm, slightly puberulent to villous; leaf blade ovate-oblong to oblong-lanceolate, 6–11 × 2–3 cm, pinnatisect; segments 11–15 pairs, ovate to ovate-oblong, margin double dentate. Stem leaves alternate or often ± opposite, similar to basal leaves but smaller. Pedicel ca. 1 cm, pubescent. Calyx narrowly campanulate, ca. 8 mm, subglabrous or slightly villous; lobes 5, ± equal, entire to serrate. Corolla purple; tube erect, slender, to 3–4.5 cm, slightly pubescent; galea erect, obtusely curved; beak cylindric, to 7 mm; lower lip deeply lobed, lobes rounded, margin glabrous. Filaments glabrous. Capsule obliquely long ovoid, ca. 1.3 cm, apiculate. Fl. Jun–Jul, fr. Jul–Sep.

Damp places in forests, thickets; 2300–3200 m. W and WC Sichuan.

1a. Stems erect to decumbent; calyx lobes narrow, ± entire ................................ 71a. subsp. omiiana

1b. Stems procumbent; calyx lobes wide, serrate ........................................... 71b. subsp. diffusa

71a. Pedicularis omiiana subsp. omiiana

峨眉马先蒿(原亚种) e mei ma xian hao (yuan ya zhong)

Stems erect to decumbent. Petiole puberulent. Calyx lobes narrow, ± entire.

Damp places in forests, thickets; 2300–3200 m. WC Sichuan.


铺散峨眉马先蒿 pu san e mei ma xian hao


W Sichuan.

34. Ser. Batangenses


巴塘系 ba tang xi

Plants usually diffuse. Stems slender, ± woody, many branched basally; branches long, decumbent. Leaves opposite or pseudo-opposite, oblong-lanceolate, pinnatisect; segments linear. Flowers axillary, pedicellate. Calyx lobes usually 5, longer than calyx tube. Corolla tube more than 2 × as long as calyx, slender; galea much dilated apically with 2 teeth at margin, usually abruptly constricted into a beak; beak straight, slender.

One species: endemic to China.


巴塘马先蒿 ba tang ma xian hao

Herbs perennial, 10–20 cm tall, drying black. Stems many, clustered, sometimes repent, only ascending apically; branches opposite, to 30 cm, with 2 lines of hairs. Leaves ± opposite, ± leathery; petiole 1–2 cm, pubescent; leaf blade oblong to ovate-oblong, 2–3 × 1–2 cm, pubescent; segments linear to linear-lanceolate, dentate or lobed. Flowers scattered. Pedicel ca. 1 cm, pubescent. Calyx ca. 1 cm; tube obconical; lobes 5, lanceolate, posterior one ± entire, lateral lobes larger, leaflike. Corolla pink to rose, erect, 1.7–3 cm, densely pubescent; galea bent at a right angle, abruptly constricted into a beak apically; beak ca. 5.5 mm, slender, straight; lower lip 1.5–1.8 cm wide, ciliate. Filaments glabrous. Capsule ovoid, slightly compressed, apiculate. Fl. Jun–Aug, fr. Aug–Sep.

Open rocky slopes; 2500–3100 m. NW and W Sichuan.


藓生系 xian sheng xi

Stems many, slender, procumbent and repent, usually branched. Leaves elliptic to lanceolate, pinnatifid to pinnatisect. Flowers axillary. Corolla long tubular; tube at least 2 x as long as calyx; galea twisted or not; beak straight or S-shaped, not bent upward, slender.

- Ten species: endemic to China.

1a. Calyx slightly cleft anteriorly.
   2a. Corolla tube 1.4–2.5 cm; beak of galea 3–4 mm; filaments ± pubescent.
      3a. Calyx ca. 10 mm; corolla tube ca. 2.5 cm; lower lip ca. 1.2 x 1.5 cm; pedicel to 3.5 cm 73. P. nanchuanensis
      3b. Calyx ca. 3.5 mm; corolla tube 1.4–1.8 cm; lower lip ca. 1.1 x 1.1 cm; pedicel 0.8–1.4(–1.7) cm

2b. Corolla tube 4–7.5 cm; beak of galea 5–10 mm; filaments glabrous.
   4a. Leaves 2.5–3.5 cm, segments 4–6 pairs 77. P. gracilituba
   4b. Leaves to 5–10 cm, segments 4–12 pairs.
      5a. Calyx lobes unequal; corolla tube glabrous; lower lip ca. 1.4 cm wide; beak of galea shorter, not S-shaped 79. P. macrosiphon
      5b. Calyx lobes ± equal; corolla tube pubescent; lower lip to 2 cm wide; beak of galea ca. 1 cm, S-shaped 80. P. muscicola

1b. Calyx deeply cleft anteriorly.
   6a. Beak of corolla to 10 cm.
      7a. Stems 5–10 cm, glabrous; corolla 4–5 cm; lower lip not ciliate; filaments glabrous 81. P. pseudomuscicola
      7b. Stems to 25 cm, slightly pubescent; corolla 6–9 cm; lower lip ciliate; filaments 2 pubescent, 2 glabrous 82. P. ruoergaiensis
   6b. Beak of corolla barely 1 cm.
      8a. Calyx 5-lobed 78. P. geosiphon
      8b. Calyx 2–4-lobed.
         9a. Corolla tube to 9.5 cm; beak of galea not curved; stems to 20 cm; petiole to 4.5 cm ... 75. P. sorbifolia
         9b. Corolla tube 2–2.6 cm; beak of galea curved; stems to 40 cm; petiole to 2 cm ... 76. P. quxiangensis

南川马先蒿 nan chuan ma xian hao
Herbs perennial, 15–25 cm tall. Roots fleshy. Stems erect, 4–7 cm, many branched; branches ascending or procumbent basally, densely white villous. Leaves alternate or sometimes ± opposite at branches; petiole to 5 cm, but barely 1.5–2 cm on branches, slightly villous; leaf blade oblong-lanceolate to ovate-oblong, 6–11 x 2.5–5 cm, slightly pubescent, pinnatisect; segments 7–12 pairs, ovate to lanceolate, pinnatifid, incised-dentate. Flowers widely spaced. Pedicel to 3.5 mm. Calyx ca. 1 cm, slightly cleft anteriorly, densely villous along 5 veins; lobes 5, ± equal, leaflike. Corolla red, ca. 3 cm; tube erect, ca. 2.5 cm, slender, pubescent; galea glabrous, ± bent at a right angle apically; beak straight, barely 3–4 mm; lower lip longer than galea, ca. 1.2 x 1.5 cm. Filaments 2 pubescent, 2 glabrous. Fl. May–Jun, fr. Jul–Aug.
- Margins of bamboo groves; 2100–2300 m. SE Sichuan.

成县马先蒿 cheng xian ma xian hao
Herbs perennial, drying black. Roots cylindrical, fleshy; rhizomes slender, with narrowly triangular, membranous scales. Stems erect, ca. 4 cm tall; lateral branches sharply ascending, to 40 cm, slender, pubescent. Leaves alternate; petiole ca. 8 cm (ca. 1.5 cm on lateral branches), long pubescent; leaf blade narrowly elliptic or ovate, 5.5–12 x 2.2–3.5 cm (leaves of lateral branches smaller), pinnatisect; segments 4–16 pairs, ca. 1 cm x 4 mm, ovate, white scurfy, double serrate or pinnatifid. Pedicel 0.8–1.4(–1.7) cm, with long hairs. Flowers solitary, axillary, few. Calyx tubular, ca. 3.5 mm, slightly cleft anteriorly, pilose, short pubescent; lobes 5, equal, linear to linear-lanceolate, ca. 2.5 mm. Corolla wine red; tube 1.4–1.8 cm, moderately long pubescent; galea erect, ca. 4.5 mm, inner margin ca. 3 mm, each side with 1 obtuse tooth; anther-bearing part bent at a right angle to erect part, beak ca. 3 mm, slender, 2-lobed at apex; lower lip whitish rose, ca. 1.1 x 1.1 cm, margin often ciliate, middle lobe exserted, broadly ovate or triangular-ovate, small. Filaments sometimes loosely short pilose at apex. Capsule enclosed at base by persistent calyx, apex obliquely bent, short beaked. Seeds compressed, obovoid, white striate. Fl. and fr. May–Jun.
- Steep slopes, shrubs; 1600–1700 m. Gansu (Chengxian, Fushan).

Pedicularis gracilituba var. setosa

77a. Pedicularis gracilituba subsp. gracilituba

细管马先蒿 (原亚种) xi guan ma xian hao (yuan ya zhong)

Stems many. Petiole and pedicel often ± glabrous. Leaves sparsely hispidulous adaxially.

Herbs perennial, not drying black. Rootsstock filiform, to 10 cm. Stems often 2–4, widely spaced, black, glabrous, with 5 or 6 leaves. Leaves alternate; petiole to 3 cm, subglabrous; leaf blade linear-oblong, more than 4 × 1.5 cm, abaxially glabrous, adaxially sparsely pubescent, pinnatisect; segments ca. 4 or 5 pairs, oblique ovate, incised-dentate. Inflorescences 1–3-flowered. Pedicel to 1.5 cm, glabrous. Calyx cylindrical; tube ca. 7 mm, cleft anteriorly to middle of tube, sparsely villous; lobes 5, unequal. Corolla tube 4.5–6.5 cm, pubescent; galea ± bent at a right angle apically, with 1 marginal tooth on each side near apex; beak straight, ca. 4 mm; lower lip longer than galea, ca. 2 × 2 cm, longer than galea. Filaments glabrous. Fl. Jul, fr. Aug.

• Mossy places in old growth coniferous forests; 3500–3900 m. S Gansu, N Sichuan.

77b. Pedicularis gracilituba subsp. setosa

地管马先蒿 di guan ma xian hao

Herbs perennial, sparsely pubescent, not drying black. Rootsstock filiform, to 10 cm. Stems often 2–4, widely spaced, black, glabrous, with 5 or 6 leaves. Leaves alternate; petiole to 3 cm, subglabrous; leaf blade linear-oblong, more than 4 × 1.5 cm, abaxially glabrous, adaxially sparsely pubescent, pinnatisect; segments ca. 4 or 5 pairs, oblique ovate, incised-dentate. Inflorescences 1–3-flowered. Pedicel to 1.5 cm, glabrous. Calyx cylindrical; tube ca. 7 mm, cleft anteriorly to middle of tube, sparsely villous; lobes 5, unequal. Corolla tube 4.5–6.5 cm, pubescent; galea ± bent at a right angle apically, with 1 marginal tooth on each side near apex; beak straight, ca. 4 mm; lower lip longer than galea, ca. 2 × 2 cm, longer than galea. Filaments glabrous. Fl. Jul, fr. Aug.

• Mossy places in old growth coniferous forests; 3500–3900 m. S Gansu, N Sichuan.

• Moist shaded forests, ravines; 1200–3500 m. NW Sichuan, NW Yunnan.


藓生马先蒿 xian sheng ma xian hao
Herbs perennial, pubescent, drying black. Stems cespitose, usually densely tufted, central stems erect, outer stems usually flexuous, ascending or procumbent, to 25 cm. Leaves alternate; petiole to 1.5 cm, sparsely villous; leaf blade elliptic to lanceolate, to 5 cm, abaxially subglabrous, adaxially sparsely pubescent, densely ciliolate along midvein, pinnatisect; segments 4–9 pairs, ovate to lanceolate, spinescent-double dentate. Pedicel to 1.5 cm, densely white villous to subglabrous. Calyx cylindric, to 1.1 cm, slightly cleft anteriorly, villous along veins; lobes 5, ± equal. Corolla rose; tube 4–7.5 cm, pubescent; galea twisted; beak S-shaped, ca. 1 cm, slender; lower lip ca. 2 × 2 cm. Filaments glabrous. Capsule enclosed by calyx, compressed, ovoid, ca. 1 cm × 7 mm. Fl. May–Jul, fr. Aug.

• Shaded damp places in Picea forests, under shrubs, near water in valleys; 1700–2700 m. Gansu, Hebei, W Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi.


假藓生马先蒿 jia xian sheng ma xian hao
Herbs perennial, diffuse. Stems cespitose, spreading or procumbent, ± black, 5–10 cm, glabrous, shiny. Leaves alternate; petiole of basal leaves 5–7 cm; leaf blade linear-oblong, ca. 3.5 cm, glabrous, adaxially shiny, pinnatisect; segments 10–20 pairs, ovate-oblong, margin lobed, spinescent dentate. Stem leaves similar to basal ones but smaller. Pedicel 5–8 mm, slender, curved. Calyx cylindric; tube ca. as long as pedicel, shallowly cleft anteriorly; lobes 5, ± equal. Corolla purple, 4–5 cm; tube slender, 3.5–4.5 cm, white pubescent apically, glabrous basally; galea twisted basally; beak semi-circular, 6–10 mm, slender; lower lip ca. 1 × 1.5–2 cm, glabrous. Filaments glabrous. Fl. Aug–Sep, fr. Sep–Oct.

• 2800–3700 m. W Sichuan.


若尔盖马先蒿 ruo er gai ma xian hao
Herbs perennial, slightly pubescent, drying black. Stems curved, to 25 cm, slender. Leaves pseudo-opposite, distal ones often alternate; petiole to 2 cm; leaf blade linear-oblong, 4–6 cm, abaxially glabrous, adaxially pubescent, pinnatisect; segments oblique-ovate, very widely spaced, incised-dentate. Pedicel to 5–10 mm. Calyx cylindric, 1–1.5 cm, shallowly cleft anteriorly; lobes 5, equal, slightly enlarged and serrate apically. Corolla purple-red, 6–9 cm; tube 5–8 cm, villous; galea bent at a right angle apically; beak evenly deflexed, ± curved, ca. 1 cm, slender; lower lip 1.6–1.8 × 1.8–2.2 cm, ciliate, middle lobe smaller than lateral ones, rounded. Filaments 2 pubescent, 2 glabrous. Fl. Jun, fr. Jul–Aug.

• Tsuga chinensis forests; 2700–2800 m. N Sichuan.


蕨叶系 jue ye xi
Stems to 28 cm, unbranched. Basal leaves long petiolate, large, pinnatisect; segments 5–9 pairs. Stem leaves few, alternate, small. Inflorescences short spicate. Calyx 5-lobed. Corolla yellow; tube straight, 2–3 × as long as calyx; galea obscurely 2-toothed, beakless; lower lip shorter than galea.

• One species: endemic to China.


蕨叶马先蒿 jue ye ma xian hao
Herbs perennial, to 40–60 cm tall, flexuously ascending, drying black. Stems single, striate, glabrous. Leaves alternate; petiole to 5–9 cm, glabrous; leaf blade oblong-ovate to broadly ovate, to 15–28 cm, abaxially subglabrous along midvein, adaxially sparsely glandular pubescent, densely ciliolate along midvein, pinnatifid to pinnatisect; segments 5–9 pairs, ovate-oblong to narrowly lanceolate, pinnatifid, margin double dentate. Inflorescences, spicate, 4.5–7 cm; bracts leaflike basally. Pedicel short. Calyx glabrous; tube 5–6 mm; lobes 5, equal, triangular, entire. Corolla 2–2.8 cm; tube erect, glabrous; galea erect, slightly pubescent along margin, rounded in front, apex bent downward; lower lip ciliate, middle lobe erose. Filaments 2 pubescent, 2 glabrous. Capsule compressed, lanceolate, ca. 1.3 cm × 4 mm, apex acute. Fl. and fr. Sep–Oct.

• Forests; 800–1600 m. Sichuan.


法且利亚叶系 fa qie li ya ye xi
Stems 1 to several together, short branched apically or unbranched. Basal leaves long petiolate, large, pinnatisect. Stem leaves alternate or ± opposite. Leaves often ovate-elliptic, to 15 × 14 cm. Inflorescences ± compact, capitulate. Corolla red or white; tube straight, ca. 2 × as long as calyx; galea twisted laterally; beak ± curved downward.

• Two species: endemic to China.
1a. Corolla tube scarcely longer than calyx; beak curved downward, parallel to proximal part of galea; leaf blade to 15 cm, leathery ............................................................ 84. *P. phaceliifolia*

1b. Corolla tube ca. 2 × as long as calyx; beak ± straight, curved only apically, pointing forward, perpendicular to basal part of galea; leaf blade 5–6 cm, membranous ............................................. 85. *P. fargesii*


法且利亚叶马先蒿 fa qie li ya ye ma xian hao

Herbs annual or biennial, to 60 cm tall, glabrous, not drying black. Stems ± flexuous ascending. Basal leaf petiole to 20 cm; leaf blade ovate-oblong to oblong-lanceolate, 10–15 × 7–13 cm, pinnatisect to pinnatipartite; segments 7–10 pairs, ovate to oblong, leathery, pinnatifid, dentate. Stem leaves often opposite, only alternate apically, smaller than basal leaves. Inflorescences ± capitulate; bracts leaflike, shorter than flowers. Calyx ca. 7 mm, slightly cleft anteriorly; lobes 5, unequal. Corolla white; tube scarcely longer than calyx; galea semicircular apically; beak parallel to basal part of galea, curved downward, 1.5–2.5 mm; lower lip ca. as long as galea. Filaments villous. Capsule obliquely lanceolate, ca. 1.7 cm, apex acute. Fl. Jun–Aug, fr. Sep–Oct.

- Grassy slopes, shaded places, *Abies* forests, under shrubs; 1500–3400 m. W Sichuan, NW Yunnan.


法氏马先蒿 fa shi ma xian hao

Herbs annual or biennial, to 20–40 cm tall, subglabrous, not drying black. Petiole of basal leaves 4–7 cm; leaf blade ovate-oblong to elliptic-oblong, 5–6 × 2.5–3.5 cm, membranous, pinnatisect to pinnatipartite; segments 5–8 pairs, ovate-oblong, incised-double dentate, abaxially sparsely white pubescent along veins, adaxially glabrous. Stem leaves often only 2 or absent, ± opposite. Inflorescences capitulate, 5- or 6-flowered; bracts leaflike. Calyx ca. 1 cm, slightly cleft anteriorly; lobes 5, ± equal, serrate. Corolla white, ca. 2 cm; tube slender, ca. 2 × as long as calyx; galea crescent-shaped apically; beak pointing forward, perpendicular to basal part of galea, ± straight, curved only apically; lower lip slightly shorter than galea, ciliate. Filaments villous. Fl. Jun–Jul, fr. Aug–Sep.

- *Pinus* and *Abies* forests, grassy slopes; 1400–1800 m. S Gansu, W Hubei, Hunan, E Sichuan.


五角系 wu jiao xi

Herbs drying black. Roots much thickened, fascicled. Stems erect. Leaves mostly on stem, opposite, lanceolate, pinnatisect. Inflorescences spicate. Calyx inflated, strongly 5-angled, with dense reticulate veins; lobes 5, triangular, entire. Corolla tube slightly bent distally; galea shorter than lower lip, 1-toothed on each side, beakless; lower lip spreading.

- One species: endemic to China.


五角马先蒿 wu jiao ma xian hao

Herbs perennial, to 20 cm tall. Roots fleshy. Stems erect, branched apically or unbranched, pubescent. Leaves opposite; petiole ca. 1.3 cm, winged; leaf blade lanceolate, ca. 2 × 1.5 cm, glabrous, sometimes ciliate, pinnatisect; segments widely spaced, linear, deeply dentate. Inflorescences to 9 cm. Flowers opposite; bracts leaflike basally, long ovate apically, ciliate. Calyx long ovate, membranous, to 1.5 cm, ciliate along veins; lobes 5, unequal, triangular, entire. Corolla pink to purple, to 2.5 cm; tube ca. 2 × as long as calyx tube; galea erect, rounded apically, beakless; margin of lower lip fimbriate. Filaments pubescent. Capsule enclosed by accrescent calyx tube, ovoid, compressed, apiculate. Fl. Jul–Aug, fr. Aug–Sep.

- Dry slopes, moist shaded banks in valleys; 2800–3300 m. SW Sichuan, E Xizang, NW Yunnan.


二歧系 er qi xi

Stems dichotomously branched or unbranched. Leaves opposite, ovate to lanceolate, pinnatisect. Stem leaves long petiolar. Inflorescences spicate. Flowers opposite. Calyx large, strongly 5-angled, with dense reticulate veins; lobes 5, entire. Corolla tube slightly exceeding calyx; galea 1-toothed on each side; beak often straight, slender.

- One species: endemic to China.


二歧马先蒿 er qi ma xian hao

*Pedicularis dichotoma* var. *wardiana* Bonati.

Herbs perennial, to 30 cm tall, not drying black. Roots not fleshy. Stems dichotomously branched or unbranched, pubescent. Leaves opposite; petiole ca. 3 cm, winged; leaf blade ovate-oblong to oblong-lanceolate, ca. 4 cm, pinnatisect; segments 5–7 pairs, widely spaced, linear, pinnatifid or dentate. Inflorescences 5–12 cm. Flowers opposite, 2–18 pairs;
bracts ovate, ciliate, apex often pinnatisect. Calyx long ovate, membranous, ca. 1.3 cm, strongly 5-veined, ciliate along veins; lobes 5, unequal, triangular, posterior one smallest. Corolla pink, ca. 2 cm; galea ± bent at a right angle apically; beak horizontal, straight, slender; lower lip glabrous at margin, middle lobe smaller than prominent lateral lobes. Filaments pubescent. Capsule enclosed by accrescent calyx, ovoid, apiculate. Fl. Jul–Sep, fr. Aug–Sep.

- Open alpine pastures, open forests; 2700–4300 m. SW Sichuan, E Xizang, NW Yunnan.


大王系 dai wang xi

Stems branched or not. Leaves in whorls of 3 or 4, sometimes opposite; bases of whorled petioles or at least bracts connate, dilated, cupular. Calyx deeply cleft anteriorly, 2-lobed; lobes entire. Galea rounded, much expanded apically, 1-toothed on each side or toothless, beakless.

Two species: China, India, Myanmar; both species in China.

1a. Leaves mostly in whorls of 4, sometimes in 3’s; most petiole and bract bases enlarged and connate ..... 88. P. rex

1b. Leaves mostly in whorls of 3, sometimes opposite or rarely in 4’s; bases of bracts enlarged and connate, but petiole bases usually not enlarged and connate ...................................................... 89. P. thammophila


大王马先蒿 dai wang ma xian hao

Herbs perennial, 10–90 cm tall, not drying black. Stems erect, pubescent or subglabrous, branched or not; branches whorled. Leaves in whorls of (3 or)4; most petiole bases enlarged, connate, cupular, to 0.5–1.5 cm; leaf blade linear-oblong to lanceolate-oblong, 3.5–12 × 1–4 cm, pinnatisect to pinnatifid; segments 10–14 pairs, linear-oblong to oblong, dentate. Inflorescences spicate, interrupted basally; bracts leaflike, longer than flowers, base enlarged, connate, cupular. Calyx 1–1.2 cm, membranous, glabrous; lobes 2 or 3, rounded. Corolla yellow, purple-red, or white, erect, ca. 3 cm; tube 2–2.5 cm; galea sparsely pubescent, apex bent downward, truncate, marginal teeth 2 or none; lower lip shorter than galea, ciliate; middle lobe very small.


Open pastures, slopes, coniferous forests; 2500–4300 m. SW Sichuan, C, NE, and NW Yunnan [N India, N Myanmar]

This subspecies includes two varieties: var. rex with a corolla 3 cm and var. rockii (Bonati) H. L. Li with a corolla 1.5–2.2 cm.


矮小大王马先蒿 ai xiao dai wang ma xian hao

Plants barely 20 cm tall. Calyx 2- or 3-lobed. Corolla yellow, ca. 3 cm. Fl. May–Jul.

- NW Yunnan.


立氏大王马先蒿 li shi dai wang ma xian hao


- W Hubei, W Sichuan.


察隅大王马先蒿 cha yu dai wang ma xian hao


- Alpine Pinus forests; ca. 3200 m. SE Xizang (Zayu).
假斗大王马先蒿  假斗大王马先蒿
Plants often more than 20 cm tall. Basal leaves short petiolate. Calyx 2-toothed. Corolla yellow, 2–2.5 cm; galea teeth subulate. Fl. May.

灌丛马先蒿
Herbs perennial, to 20–60 cm tall, drying black. Roots ± fleshy. Stems long branched throughout entire length or near base only; branches opposite or in whorls of 3, with 4 lines of glandular hairs. Leaves mostly in whorls of 3, sometimes opposite or rarely in 4’s; petiole to 3.5 cm, pubescent, usually not enlarged and connate; leaf blade oblong or linear-oblong, ca. 1 cm × 2–5 mm, pinnatisect; segments 9–12 pairs, narrowly lanceolate, pinnatifid-dentate. Inflorescences spicate; bracts leaflike, bases enlarged, connate, cupular, 1–1.5 cm high. Calyx 7–8 mm, membranous, glabrous, cleft anteriorly to 1/2 as long as tube; lobes rounded. Corolla yellow, 2–2.5 cm, pubescent; tube ca. 2 × as long as calyx; galea erect, bowed apically, ca. as long as tube, with 2 marginal teeth; lower lip 7–8 mm, ciliate. Filaments pubescent. Fl. Jun–Jul, fr. Aug.

1a. Plants more than 20 cm tall; stems long branched throughout entire length. Leaves ca. 5 cm wide

89a. **Pedicularis thamnophila** subsp. **thamnophila**
灌丛马先蒿
Plants more than 20 cm tall. Stems long branched throughout entire length. Leaves ca. 5 cm wide. Fl. Jun–Jul. • Picea forests, alpine meadows; 3200–4000 m. SW and W Sichuan, SE Xizang, NW Yunnan.

1b. Plants barely 15 cm tall; stems long branched near base only; leaves barely 2 cm wide

89b. **Pedicularis thamnophila** subsp. **cupuliformis**
杯状灌丛马先蒿
Plants low, barely 15 cm tall. Stems long branched near base only. Leaves barely 2 cm wide. Fl. Jul. • Meadows of canopy gaps in Abies forests; ca. 4000 m. W Sichuan.

拟斗叶系
Stems erect, branched basally or unbranched. Leaves in whorls of 3 or 4, pinnatisect; bases of petioles and bracts connate, greatly dilated, cupular. Calyx slightly cleft anteriorly; lobes 2, serrate. Corolla tube ca. 2 × as long as calyx; galea navicular, expanded apically, indistinctly beaked, apex toothless to very obscurely 1-toothed.

华丽系
Stems erect, branched or not, robust. Leaves in whorls of 3 or 4, pinnatisect; bases of petioles and bracts connate, greatly dilated, cupular. Calyx 2- or 5-lobe, double serrate. Corolla large; tube as long as to slightly longer than calyx; galea ± falcate, ending in a prominent beak; lower lip wide.

1a. Calyx less than 1/3 cleft anteriorly, 5-lobed; corolla purplish red to red; beak of galea 2–4 mm, straight 91. **P. superba**
1b. Calyx 1/3 cleft anteriorly, 2-lobe; corolla yellow; beak of galea 5–6 mm, bent downward .......... 92. **P. connata**
华丽马先蒿 hua li ma xian hao
Herbs perennial, 30–90 cm tall. Roots thickened, fascicled. Stems hollow, unbranched, with 4–10 cm internodes, sparsely pubescent or glabrous. Leaves in whorls of 3 or 4; bases of distal petioles and bracts greatly dilated, connate; leaf blade long elliptic, proximal 1 or 2 whors largest, 9–13 cm, pinnatisect; segments 12–15 pairs, lanceolate or linear-lanceolate, incised-dentate. Inflorescences spicate, to 20 cm; bracts leaflike. Calyx 2.2–2.5 cm, slightly cleft anteriorly; lobes 5, unequal. Corolla purplish red to red, 3.7–5 cm; tube 1.5–3 cm, slightly enlarged and curved apically; galea erect, glabrous; beak straight, triangular, 2–4 mm; lower lip ca. as long as galea, 1.7–2 × 2.7–3.5 cm, ciliate. Filaments pubescent. Capsule compressed, ovoid, 2.5–1.2 cm. Fl. Jun–Aug, fr. Jul–Aug.

• Alpine meadows, open stony pastures, shaded places near forest margins; 2800–4000 m. SW Sichuan, NW Yunnan.

连叶马先蒿 lian ye ma xian hao
Herbs perennial, 30–40 cm tall. Stems usually branched basally, pubescent or glabrescent. Leaves in whorls of 4, proximal ones sometimes opposite; petiole 4–5 cm, slender, bases often dilated, connate; leaf blade oblong-lanceolate, 9–10 × 2.5–3 cm, membranous, glabrous or glabrescent, pinnatisect; segments 8–11 pairs oblong-lanceolate, margin double dentate or lobed. Flowers axillary; bracts leaflike. Pedicel 1–2 mm. Calyx ca. 1.5 cm, 1/3 cleft anteriorly; lobes 2, lanceolate-oblong, 7–8 mm. Corolla yellow; tube erect, 1.7–2 cm; galea erect basally, ca. 1 cm; beak bent downward, 5–6 mm, slender; lower lip 1.3–1.8 cm; lobes 3, rounded, middle lobe smallest. 2 filaments sparsely villous and 2 glabrous or all pubescent. Fl. Jul–Aug, fr. Aug–Sep.

• Forests in valleys; 4000–4300 m. SW Sichuan, NW Yunnan.


斗叶系 dou ye xi
Stems erect, unbranched. Leaves in whorls of 3 or 4, pinnatisect. Bases of petioles and bracts greatly dilated, connate. Calyx 2–5-lobed. Corolla tube ca. 3 × as long as calyx; galea strongly deflexed; beak curved, slender.

• Two species: endemic to China.

1a. Galea not crested; middle lobe of lower corolla lip entire; calyx 2-lobed .......................... 93. *P. cyathophylla*

1b. Galea crested; middle lobe of lower corolla lip emarginate apically; calyx 3–5-lobed ...... 94. *P. xiangchengensis*

斗叶马先蒿 dou ye ma xian hao
Herbs perennial, 15–55 cm tall. Roots conical, with a tuft of fibrous roots near apex. Stems pubescent. Leaves in whorls of 3 or 4, petioles and bract bases greatly dilated, connate, cupular, to 5 cm high; leaf blade long elliptic, to 14 × 4 cm, abaxially sparsely ciliate along veins, pinnatisect; segments incised-dentate. Inflorescences spicate; bracts leaflike apically, pinnato-lobate, pubescent. Calyx ca. 1.5 cm, long pubescent, deeply cleft anteriorly; lobes 2, oblong-lanceolate, 2–3 mm, incised-serrate to entire. Corolla purple-red, 5–6 cm; tube bent at a right angle apically, 3.5–5(–6) cm × 2–2.5 mm, slender; galea strongly bent, not crested; beak curved inward, ca. 7 mm; lower lip wider than long, ± enveloping galea, middle lobe entire. Filaments pubescent throughout. Fl. May–Jul, fr. Jul–Aug.

• Alpine meadows; ca. 4700 m. SW Sichuan, NW Yunnan.


乡城马先蒿 xiang cheng ma xian hao
Herbs perennial, 30–50 cm tall, ± drying black. Roots stout, woody. Stems 1–3, glabrescent. Basal leaves numerous, persistent; petiole 3–4 cm; leaf blade oblong to lanceolate-oblong, 8–10 cm, glabrescent, pinnatisect; segments 10–15 pairs, oblong, margin double dentate. Stem leaves in whorls of 4, similar to basal leaves but with much dilated and connate petioles. Inflorescences racemose, to 20–30 cm, interrupted; bracts leaflike, petioles strongly connate, cupular, to 2 cm high. Pedicel ca. 1 mm. Calyx oblong, ca. 1.5 cm, glabrescent, ca. 1/2 cleft anteriorly; lobes 3–5, small. Corolla purple-red, 3.5–4 cm; tube 2.5–3 cm, glabrous externally; galea nearly falcate apically, crested; beak slightly S-shaped, 6–7 mm; lower lip ca. 1.3 × 1.2 cm, ciliate, middle lobe emarginate apically. Capsule pubescent throughout. Capsule enclosed by accrescent calyx, ellipsoid-ovoid, slightly compressed, ca. 2 cm. Fl. Jul–Aug, fr. Aug–Sep.

• Gullies, forests on mountain slopes; 4100–4300 m. W Sichuan.

44. Ser. Pedicularis

沼生系 zhao sheng xi

Herbs not drying black. Stems 1 to several together, usually many branched apically. Stem leaves alternate or opposite, linear-lanceolate to ovate, pinnatifid to pinnatisect. Flowers loosely racemose. Calyx 2- or 3-lobed. Corolla tube slightly exceeding calyx; galea 1-toothed on each side at apex; lower lip ca. as long as galea.

Twelve species: arctic and subarctic regions of both hemispheres; three species in China.

This series was formerly treated as ser. *Palustris* Maximowicz that included the type of the genus *Pedicularis*, *P. sylvatica* Linnaeus.

1a. Leaves pinnatisect; calyx lobes serrate ................................................................. 95. *P. palustris*
1b. Leaves pinnatifid to pinnatifoliate; calyx lobes entire.

2a. Leaves linear-lanceolate, segments serrate or double dentate apically .................... 96. *P. labradorica*
2b. Leaves ovate to lanceolate-oblong, segments lobed or double dentate .................... 97. *P. kiangsiensis*


沼生马先蒿 *zhao sheng ma xian hao*

Herbs biennial, sometimes annual, 30–60 cm tall, subglabrous. Stems erect, usually many branched; branches rigid, alternate, rarely pseudo-opposite or pseudo-whorled. Leaves alternate or opposite, rarely whorled, short petiolate or sessile; leaf blade triangular-lanceolate to linear, subglabrous, pinnatisect; segments linear to lanceolate, pinnatifid to dentate. Inflorescences racemose; bracts leaflike. Pedicel 1–2 mm. Calyx 7–8 mm; lobes 2, crenate-serrate. Corolla purple, 1.3–2.5 cm; tube erect, nearly 2 × as long as calyx, glabrous; galea erect, with 1 subulate marginal tooth on each side at apex; lower lip slightly longer than galea, ciliate. Filaments glabrous. Capsule obliquely ovoid, apiculate. Fl. Aug, fr. Sep. 2n = 16.

Marshy places, swampy meadows, flat bogs, ditches; ca. 400 m. NW Heilongjiang, NE Nei Mongol, N Xinjiang [Kazakstan, N Mongolia, Russia; C and N Europe].

1a. Corolla 1.8–2.5 cm; plants biennial ................................................................. 95a. subsp. *palustris*
1b. Corolla 1.3–1.6 cm; plants annual 95b. subsp. *karoi*

95a. *Pedicularis palustris* subsp. *palustris*

沼生马先蒿(原亚种) *zhao sheng ma xian hao* (yuán yà zhòng)

*Pedicularis erecta* Gilibert.

Plants biennial. Corolla 1.8–2.5 cm.

Marshy places. N Xinjiang [Kazakstan, N Mongolia, Russia (European part); C and N Europe].


卡氏沼生马先蒿 *ka shí zhào shèng mǎ xiān hǎo*


Plants annual. Corolla 1.3–1.6 cm.

Swampy meadows, flat bogs, watery ditches; ca. 400 m. NW Heilongjiang, NE Nei Mongol [Mongolia, Russia].


拉巴拉多马先蒿 *lā ba lā duo mǎ xiān hǎo*

*Pedicularis euphrasioides* Stephan ex Willdenow; *P. euphrasioides* var. *labradorica* (Houttuyn) Willdenow;

*P. labradorica* Houttuyn, not Wirsing; *P. labradorica* Wirsing var. *simplex* Hultén.

Herbs biennial, 10–30 cm tall. Stems erect, rigid, pubescent, many branched; branches alternate, rarely opposite. Leaves alternate or ± opposite; petiole 1–2 mm; leaf blade linear-lanceolate, 1.5–6 cm, abaxially glandular pubescent, adaxially glabrous, pinnatifid or only double dentate apically; segments serrate or distal ones double dentate. Inflorescences racemose; bracts leaflike. Pedicel ca. 1 mm. Calyx 6–7 mm, ± leathery, glabrous or sparsely pubescent, deeply cleft anteriorly; lobes 3, unequal, entire. Corolla yellow, sometimes galea tinged with red or purple, 1.8–2 cm; tube ca. 1/2 as long as calyx, glabrous; galea slightly curved apically, with 1 lanceolate marginal tooth on each side at apex; lower lip nearly as long as galea, ciliate. Filaments 2 pubescent, 2 glabrous. Capsule broadly lanceolate, apex acute. Fl. Aug, fr. Sep. 2n = 16.

Mossy and lichenous luxuriant heath and tundra; 300–900 m. NE Nei Mongol [Arctic and subarctic Asia, Europe, and North America].


江西马先蒿 *jiāng xi mǎ xiān hào*

Herbs perennial, 70–80 cm tall. Stems erect, branched or not, with 2 lines of hairs. Leaves pseudo-opposite, often alternate apically; petiole 1–2.5 cm; leaf blade long ovate to lanceolate-oblong, 2–4 cm, abaxially subglabrous, adaxially sparsely pubescent, pinnatifid to pinnatifoliate; segments 4–9 pairs, oblong to obliquely triangular-ovate, margin lobed or double dentate. Inflorescences racemose, short; bracts leaflike, shorter than flowers. Pedicel ± curved, densely pubescent. Calyx ca. 7 mm, glandular pubescent, deeply cleft anteriorly; lobes 2, equal, entire, apex acute. Corolla 2–2.2 cm; tube ca. 1.2 cm; galea falcate, 8–9 mm, with 1 fine marginal tooth on each side at apex; lower lip ca. 8 × 7 mm, ciliate. Filaments glabrous. Fl. Aug–Sep, fr. Sep–Oct.

- Rocks of sunny slopes, among shrubs on mountain summits; 1500–1700 m. Jiangxi (Wukung Shan), Zhejiang.


总花系 *zōng huā xì*
Ser. Compactae Maximowicz.

Plants ± woody. Stems usually many branched apically. Leaves alternate or sometimes opposite basally, ovate to linear-lanceolate, margin crenate and double dentate. Inflorescences racemose or flowers axillary; bracts sessile. Calyx deeply cleft anteriorly, 2-lobed. Corolla large; tube ca. 2 x as long as calyx or shorter; beak distinct.

Six species: North America, Asia, Europe; one species in China.

98. Pedicularis resupinata Linnaeus, Sp. Pl. 2: 608. 1753. 返顾马先蒿 fan gu ma xian hao

Herbs perennial, 30–70 cm tall, not drying black. Roots fascicled, fibrous. Stems often single, erect, many branched apically, sparsely pubescent or subglabrous. Stem leaves numerous, petiolate or uppermost sometimes sessile; petiole to 12 mm, glabrous or pubescent; leaf blade ovate to oblong-lanceolate, 2.5–5.5 x 1–2 cm, membranous to papery, glabrous or sparsely pubescent, base broadly cuneate to rounded, margin crenate or serrate, apex acuminate. Flowers axillary. Pedicel short or absent. Calyx 6–9 mm, glabrescent; lobes 2, broad, entire. Corolla pink to purple or yellowish, 2–2.5 cm; tube straight, 1.2–1.5 cm; galea falcate; beak conical, ca. 3 mm; lower lip slightly longer than galea, ciliate. Filaments 2 pubescent, 2 glabrous. Capsule obliquely oblong-lanceolate, 1.1–1.6 cm, slightly longer than calyx. Fl. Jun–Aug, fr. Jul–Sep. 2n = 16, 32.

Grassy slopes, open forests; 300–2000 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Kazakhstan, Korea, Mongolia, Russia].

1a. Plants sparsely pubescent to glabrous.

2a. Corolla pink to purple; capsule obliquely oblong-lanceolate, slightly longer than calyx .................................................. 98a. subsp. resupinata

2b. Corolla yellowish; capsule obliquely linear-lanceolate, ca. 2 x as long as calyx or more .......................... 98b. subsp. galeobdolon

1b. Plants ± densely pubescent.

3a. Leaves 2.5–3.5 cm; beak of corolla short, truncate .......... 98c. subsp. crassicaulis

3b. Leaves 4–5.5 cm; beak of corolla longer, conical ...................... 98d. subsp. lasiophylla

98a. Pedicularis resupinata subsp. resupinata 返顾马先蒿(原亚种) fan gu ma xian hao (yuan ya zhong)

Plants sparsely pubescent to glabrous. Corolla pink to purple. Capsule obliquely oblong-lanceolate, slightly longer than calyx.

Grassy slopes, open forests; 300–2000 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Jilin, Liaoning, Shanxi, Shandong, Sichuan [Japan, Kazakhstan, Korea, Mongolia, Russia].


W Hubei, S Shaanxi, E Sichuan.


Guangxi, Guizhou, Hubei, Sichuan.


Plants densely pubescent. Leaves long, 4–5.5 cm. Corolla pink to purple; beak conical, long. Capsule obliquely oblong-lanceolate, 1.1–1.6 cm. Fl. Jul–Aug.

Shaanxi.


肉质系 rou zhi xi

Plants ± woody. Stems many branched apically or unbranched. Leaves alternate, ovate to linear-oblong, shallowly to deeply crenate. Inflorescences spicate, racemose, or axillary, usually short and compact; bracts sessile. Calyx 2-lobed or sometimes 4- or 5-lobed. Corolla tube less than 2 x as long as calyx; galea recurved apically; beak short, indistinct.

About 12 species: Bhutan, China, India, Nepal, Sri Lanka, Thailand; nine species in China.

1a. Calyx glabrous, lobes entire; leaves linear-lanceolate .......................................................... 99. P. nigra

1b. Calyx pubescent, lobes serrulate, serrate, or lobed; leaves ± ovate or oblong .
2a. Corolla 3.5–4.5 cm, tube ca. 2 cm.
3a. Calyx lobes ca. 1/2 as long as calyx tube; lower corolla lip longer than galea; leaves petiolate 100. *Pedicularis lunglingensis*
3b. Calyx lobes ca. 1/3 as long as calyx tube or less; lower corolla lip shorter than galea; leaves ± sessile

2b. Corolla 2.5–3.5 cm, tube to 1.8 cm.
4a. Leaves to 10 × 2.5 cm, petiole distinct; calyx deeply cleft anteriorly, lobes narrow ... 102. *Pedicularis veronicifolia*
4b. Leaves to 6 × 1.5 cm, petiole short or absent; calyx scarcely cleft anteriorly, lobes wider.
5a. Lower corolla lip wider than long or nearly equal; beak of galea 2–3 mm.
   6a. Calyx lobes 4; filaments 2 pubescent; beak of galea ca. 2 mm .......................... 106. *Pedicularis crenata*
   6b. Calyx lobes 5; filaments glabrous; beak of galea ca. 3 mm .......................... 107. *Pedicularis gyirongensis*
5b. Lower corolla lip longer than wide; beak of galea 1–1.5 mm.
7a. Corolla tube 0.8–1.1 cm, slightly exceeding calyx; filaments glabrous ........ 103. *Pedicularis koueytchensis*
7b. Corolla tube ca. 1.8 cm, 1.5–2 × as long as calyx; filaments pubescent.
8a. Leaves ca. 4 cm × 12 mm, ca. 10-crenate on each side ......................... 104. *Pedicularis tsiangii*
8b. Leaves 2–3.5 cm × 6–9 mm, 12- or 13-crenate on each side .......................... 105. *Pedicularis vairoensis*


**hei ma xian hao**


Herbs perennial, to 70 cm tall, glabrous, drying black. Rootstock fleshy. Stems erect, rigid, branched or not. Leaves alternate, occasionally pseudo-opposite; petiole to 10 cm; leaf blade often linear-lanceolate, to 7 cm × 9 mm, abaxially sparsely pubescent, adaxially densely hispidulous, long attenuate at both ends, finely double dentate. Inflorescences spike-like; bracts leaflike. Calyx 1–1.5 cm, 1/2 cleft anteriorly, glabrous; lobes 2, triangular, ± entire. Corolla violet-red, 2.8–3.5 cm, sparsely fine pubescent; tube straight, to 2.2 cm; galea falcate, to 1.5 cm; beak scarcely conspicuous; lower lip to 1.4 × 1.1 cm, erose-serrulate. Filaments sparsely pubescent. Capsule obliquely lanceolate, ca. 1.4 cm × 4.5 mm, slightly longer than calyx, apex acute. Seeds black, triangular-ovoid, ca. 1.2 mm. Fl. Jul–Oct, fr. Aug–Nov.


**d i huang ye ma xian hao**

Herbs perennial, to 60 cm tall. Rootstock fleshy. Stems erect, many branched or unbranched, finely pubescent or glabrescent. Leaves petiolate; leaf blade obovate to rhomboid-lanceolate, 4–10 × 1–2.5 cm, hirsipod on both surfaces, base long attenuate, pinnatifid or double crenate, apex rounded to attenuate. Inflorescences racemose, more than 10 cm, interrupted basally; bracts broadly ovate to oblong-ovate. Calyx ca. 1.2 cm, densely hispidulous, long pubescent along veins, deeply cleft anteriorly; lobes 2 or 3, narrow, distinctly serrulate. Corolla pale rose, 2.4–3 cm; tube 1.4–1.5 cm, glabrous; galea falcate, 1.1–1.4 cm; beak to 2 mm, truncate; lower lip ca. 1 cm. Filaments villous. Capsule obliquely lanceolate-ovoid, 1.1–1.3 cm, apex acute. Fl. Aug–Oct, fr. Sep–Nov.


**ga shi ma xian hao**

Herbs perennial, to 30 cm tall. Stems many branched at middle, densely red-brown pubescent. Leaves ± sessile, ovate-oblong, 2–4 × 1–1.5 cm, fleshy, long pubescent along midvein, entire or incised-serrulate, apex obtuse. Cymes corymbose; bracts sessile, triangular, shorter than flowers, pubescent. Calyx to 1.5 cm, fleshy, ciliate, nearly 1/2 cleft anteriorly; lobes 2, ca. 1/3 as long as tube or less, broadly ovate to rounded, double serrulate. Corolla rose, 4–4.5 cm, glabrous; tube ca. 2 cm; galea falcate, more than 2 cm; beak short; lower lip slightly shorter than galea, glabrous. Filaments sparsely pubescent. Fl. Oct, fr. Nov.

**W Guizhou.**


**hei ma xian hao**

Herbs perennial, to 10–15 cm tall, hirsute throughout. Stems erect or ascending, often branched; branches slender, 5–7 cm. Leaf petiole 5–7 mm; leaf blade ovate-oblong to narrowly oblong, 2.3–6.0 × 1.5 cm, fleshy, base broadly cuneate, pinnatifid; segments elliptic, crenate. Flowers axillary, sessile; bracts leaflike, longer than calyx. Calyx 1–1.2 cm, cleft anteriorly, densely villous; lobes 2, ca. 1/2 as long as tube, incised-serrulate. Corolla red or purple, 3.5–4 cm, glabrous; tube straight, ca. 2 cm; galea falcate, 1–1.5 cm; beak ca. 1 mm, truncate; lower lip longer than galea, to 1.6 cm, glabrous. Filaments sparsely long pubescent to subglabrous. Fl. Sep–Oct, fr. Oct–Nov.

**W Guizhou.**


**di huang ye ma xian hao**

Herbs perennial, to 60 cm tall. Rootstock fleshy. Stems erect, many branched or unbranched, finely pubescent or glabrescent. Leaves petiolate; leaf blade obovate to rhomboid-lanceolate, 4–10 × 1–2.5 cm, hirsipod on both surfaces, base long attenuate, pinnatifid or double crenate, apex rounded to attenuate. Inflorescences racemose, more than 10 cm, interrupted basally; bracts broadly ovate to oblong-ovate. Calyx ca. 1.2 cm, densely hispidulous, long pubescent along veins, deeply cleft anteriorly; lobes 2 or 3, narrow, distinctly serrulate. Corolla pale rose, 2.4–3 cm; tube 1.4–1.5 cm, glabrous; galea falcate, 1.1–1.4 cm; beak to 2 mm, truncate; lower lip ca. 1 cm. Filaments villous. Capsule obliquely lanceolate-ovoid, 1.1–1.3 cm, apex acute. Fl. Aug–Oct, fr. Sep–Nov.

**W Guizhou.**


滇东马先蒿 dian dong ma xian hao
Herbs perennial, 10–30 cm tall, not drying black. Rootstock fleshy. Stems single, erect, branched apically or unbranched, densely woolly pubescent. Proximal leaves petiolate, distal ones sessile; petiole to 1 cm; leaf blade ovate-oblong, 2–2.5 × 0.8–1.2 cm, fleshy, densely pubescent on both surfaces, pinnatifid; segments 7–9 pairs, dentate, teeth callose. Inflorescences short racemose or spicate, 6–10-flowered; bracts 1–1.4 cm × 5–7 mm, pubescent. Pedicel short or ± absent. Calyx 1–1.1 cm, membranous, villous; lobes 2, rounded, ca. 1/4 as long as tube, serrulate. Corolla purple-red, 2–2.5 cm; tube 8–11 mm, slightly exceeding calyx; galea recurved, 1.3–1.5 cm; beak ca. 1.5 mm, erose, truncate; lower lip longer than galea, 1.3–1.4 × 1.1–1.3 cm. Filaments glabrous. Fl. Jul–Oct, fr. Sep–Oct.
- Stony mountain pastures; 2700–3400 m. E Yunnan.


细波齿马先蒿 xi bo chi ma xian hao
Herbs ca. 30 cm tall. Stems single, branching apically, densely pubescent. Leaves ± sessile, linear-oblong, 2–6 × 0.3–1.8 cm, ± fleshy, densely pubescent on both surfaces. Flowers ± dense. Calyx cylindrical, densely pubescent, deeply cleft anteriorly; lobes 2, flabellate, serrate. Corolla rose, ca. 3 cm, glabrous; tube erect, ca. 1.8 cm; galea falcate apically, ca. 1.2 cm, beak conical, barely 1 mm, apex truncate; lower lip as long as galea, glabrous. Filaments sparsely long pubescent. Capsule obliquely lanceolate, ca. 1.3 cm × 4.5 mm. Fl. and fr. Oct.
- W Yunnan.


蒋氏马先蒿 jiang shi ma xian hao
Herbs ca. 35 cm tall. Stems erect, branched apically or unbranched, densely woolly pubescent. Leaves ± sessile, linear-oblong, 2–3.5 cm × 6–9 mm, ± fleshy, pubescent on both surfaces, base rounded or subcordate, 12- or 13-crenate on each side, apex acute. Inflorescences spicate, to 8 cm; bracts ovate-oblong, ca. 2 cm × 6 mm, pubescent on both surfaces, crenate. Flowers ± dense. Calyx cylindrical, ca. 1.2 cm × 3 mm, membranous, pubescent, deeply cleft anteriorly; lobes 2, flabellate, serrate. Corolla rose, ca. 3.5 cm, glabrous; tube erect, ca. 1.8 cm; galea straight basally, strongly falcate apically, ca. 1.7 cm; beak barely 1 mm, apex truncate; lower lip ca. as long as galea, glabrous. Filaments sparsely pubescent. Fl. Oct, fr. Nov.


波齿马先蒿 bo chi ma xian hao
Herbs perennial, 20–35 cm tall, base ± woody, densely gray pubescent, not drying black. Stems erect, leafy, not or sometimes 2- or 3-branched; branches forked or ascending. Leaves short petiolate (barely 1 mm) to ± sessile; leaf blade linear-oblong, sometimes ovate-elliptic basally, 2–6 × 0.3–1.8 cm, ± fleshy, densely tomentose on both surfaces, base attenuate to subcordate-clasping, double crenate, teeth callose, apex obtuse. Inflorescences short racemose, many flowered, interrupted basally; bracts leaflike, ovate, longer than calyx. Pedicel 1.5–2 mm, hispid. Calyx ca. 1.1 cm; tube to 1.8 cm, membranous, densely villous, scarcely cleft anteriorly; lobes 2(or 4), serrate. Corolla red or purple, 2.2–2.4 cm; tube erect, exceeding calyx; galea recurved apically; beak ca. 2 mm, apex truncate; lower lip 0.9–1 × 1.1–1.4 cm, slightly longer than galea, ciliate. Filaments 2 sparsely pubescent, 2 glabrous. Fl. Aug–Sep, fr. Sep–Oct.
- Alpine meadows, grassy slopes, among limestone rocks; 2600–3400 m. NW Yunnan.

106a. *Pedicularis crenata* subsp. *crenata* 　

波齿马先蒿(原亚种) bo chi ma xian hao (yuan ya zhong)
Leaves 2–6 × 0.3–1.8 cm, base attenuate to rounded .................................. 106a. subsp. *crenata*


全裂波齿马先蒿 quan lie bo chi ma xian hao

Leaves ca. 2 cm × 7–8 mm, base subcordate-clasping or rarely broadly cuneate. Fl. Aug, fr. Sep.
- Alpine meadows, grassy slopes; 2600–3000 m. NW Yunnan.


吉隆马先蒿 ji long ma xian hao
Herbs perennial, 20–30 cm tall, white villous, drying black. Stems erect, many branched; branches slender, ascending. Leaves few; petiole 1–7 mm; leaf blade ovate-oblong to elliptic-oblong, 1–4 cm, fleshy, densely villous on both surfaces, base cuneate or rounded, margin double dentate, apex obtuse.
Inflorescences racemose, elongating in fruit, many flowered; bracts leaflike, longer than calyx. Pedicel barely 4 mm, slender. Calyx cylindric, ca. 7 mm, membranous, distinctly villous, 1/3 cleft anteriorly; lobes 5, unequal, serrate. Corolla red, 1.8 cm; tube erect, exceeding calyx; galea nearly bent at a right angle apically, front very elevated, densely pubescent; beak ca. 3 mm, slender; lower lip ca. 1.2 × 1.8 cm, ciliate. Filaments glabrous. Capsule narrowly ovoid, ca. 1 cm, short apiculate. Fl. and fr. Aug–Sep.

*Mixed forests on hillsides; ca. 2400 m. S Xizang (Gyirong).*


**1a.** Leaves 1- or 2-pinnatisect, segments pinnatifid, lanceolate-oblong to linear-lanceolate; galea long, apex with

- an obscure beak; pedicels barely 1 mm .......................... 108. *P. tenuisecta*

**1b.** Leaves 1-pinnatisect or pinnatifid, segments ovate to oblong, crenate to pinnatifid; galea shorter, apex with a

- conspicuous beak; pedicels 3–6 mm.

**2a.** Corolla 1.8–2.5 cm; beak of galea ca. 1.5 mm; lower lip glabrous ........................................ 109. *P. henryi*

**2b.** Corolla 2.5–3 cm; beak of galea ca. 3 mm; lower lip sparsely ciliate ........................................ 110. *P. labordei*


纤裂马先蒿 \textit{xian lie ma xian hao}

Herbs perennial, 30–60 cm tall, drying black. Stems 1 to several, erect, rigid, leafy, sometimes many branched, densely pubescent. Leaves sessile, ovate-elliptic to lanceolate-oblong, 1–3 cm × 3–15 mm, pubescent on both surfaces, 1- or 2-pin-natisect; segments ca. 10 pairs, lanceolate-oblong to linear-lanceolate, pinnatifid. Inflorescences racemose, to 20 cm, many flowered; bracts leaflike, longer than calyx, shorter than flowers. Pedicel barely 1 mm. Calyx ovoid, 6–9 mm, deeply cleft anteriorly, sparsely pubescent; lobes 5, serrate. Corolla purple-red, 1.5–2.4 cm; tube slightly bent basally, ca. 2 × as long as calyx tube, expanded apically; galea curved at middle, apex obuse or truncate; beak obscure; lower lip shorter than galea, to 1.1 cm. Filaments sparsely villous. Capsule obliquely lanceolate-ovoid, ca. 1.1 cm × 4.5 mm. Fl. Aug–Sep, fr. Sep–Nov.

Alpine meadows in coniferous forests; 1500–3700 m. W Guizhou, SW Sichuan, NW Yunnan [Laos].


亨氏马先蒿 \textit{heng shi ma xian hao}

Herbs perennial, 16–35 cm tall, drying black. Stems ascending, often several, ± diffuse at base, leafy, densely rust colored pubescent. Leaf petiole 0.5–1.5 cm, slender, pubescent; leaf blade oblong-lanceolate to linear-oblong, 1.5–3.4 cm × 5–8 mm, papery, pubescent on both surfaces, 1-pinnatisect; segments 6–12 pairs, oblong to ovate, dentate, teeth white and callose. Inflorescences racemose, to 20 cm, often interrupted basally. Pedicel 3–5 mm, slender, densely pubescent. Calyx to 8 mm, 1/2–2/3 cleft anteriorly; lobes (3 or)5, unequal, pubescent; galea curved apically; beak ca. 1.5 mm, apex shallowly 2-cleft; lower lip ca. 1.5 cm, long, pubescent. Filaments densely villous. Capsule obliquely lanceolate-ovoid, to 1.6 cm × 4.5 mm, short apiculate. Fl. May–Sep, fr. Aug–Nov.

- Open mountain slopes, meadows, open forests; 400–1400 m. N Guangdong, NW Guangxi, W Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Laos, Vietnam].


拉氏马先蒿 \textit{la shi ma xian hao}

*Pedicularis stapfii* Bonati.

Herbs perennial. Stems procumbent to ascending, numerous, many branched, pubescent. Leaves alternate, sometimes ± opposite; petiole 5–10 mm, densely long white pubescent; leaf blade oblong, 2–4.5 cm, pubescent on both surfaces, pinnatifid or sometimes 1-pinnatisect; segments 5–8 pairs, ovate-lanceolate to triangular-ovate, pinnatifid or incised-double dentate. Inflorescences subcapitate, 2.5–3 cm; bracts leaflike, shorter than flowers. Pedicel 5–6 mm, slender, long pubescent. Calyx 1–1.2 cm, 1/2 cleft anteriorly, densely villous along veins; lobes 5, unequal to ± equal, flabellate, serrate. Corolla purple-red, 2.5–3 cm; tube slightly curved at middle, ca. 1.5 cm, expanded apically; galea nearly rectangularly bent apically, front elevated; beak ca. 3 mm; lower lip ca. 1 × 1.4 cm, sparsely ciliate. Filaments long pubescent. Capsule obliquely narrowly ovoid, ca. 1.1 cm × 5 mm, slightly exceeding calyx, apiculate. Fl. Jul–Sep, fr. Aug–Oct.
Stems erect or somewhat prostrate, usually many branched. Stem leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

- Five species: endemic to China.

1a. Corolla tube 1.5–1.7 cm. 
2a. Galea not marginally toothed; calyx more than 1/2 cleft anteriorly; filaments glabrous. 114. *P. limprichtiana*

2b. Galea marginally 2-toothed; calyx shallowly cleft anteriorly; filaments pubescent

1b. Corolla tube less than 1 cm.

3a. Beak of galea bent upward; middle lobe of lower corolla lip rounded, apex not emarginate; leaves pinnatifid

3b. Beak of galea straight or bent downward; middle lobe of lower corolla lip often ovate, apex emarginate; leaves pinnatifid to pinnatisect. Inflorescences short racemose or subcapitate. Pedicel 0.5–1.6 cm, slender, pubescent. Leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

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1b. Corolla tube less than 1 cm.

3a. Beak of galea bent upward; middle lobe of lower corolla lip rounded, apex not emarginate; leaves pinnatifid

3b. Beak of galea straight or bent downward; middle lobe of lower corolla lip often ovate, apex emarginate; leaves pinnatifid to pinnatisect. Inflorescences short racemose or subcapitate. Pedicel 0.5–1.6 cm, slender, pubescent. Leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

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1b. Corolla tube less than 1 cm.

3a. Beak of galea bent upward; middle lobe of lower corolla lip rounded, apex not emarginate; leaves pinnatifid

3b. Beak of galea straight or bent downward; middle lobe of lower corolla lip often ovate, apex emarginate; leaves pinnatifid to pinnatisect. Inflorescences short racemose or subcapitate. Pedicel 0.5–1.6 cm, slender, pubescent. Leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

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1b. Corolla tube less than 1 cm.

3a. Beak of galea bent upward; middle lobe of lower corolla lip rounded, apex not emarginate; leaves pinnatifid

3b. Beak of galea straight or bent downward; middle lobe of lower corolla lip often ovate, apex emarginate; leaves pinnatifid to pinnatisect. Inflorescences short racemose or subcapitate. Pedicel 0.5–1.6 cm, slender, pubescent. Leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

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2b. Galea marginally 2-toothed; calyx shallowly cleft anteriorly; filaments pubescent

1b. Corolla tube less than 1 cm.

3a. Beak of galea bent upward; middle lobe of lower corolla lip rounded, apex not emarginate; leaves pinnatifid

3b. Beak of galea straight or bent downward; middle lobe of lower corolla lip often ovate, apex emarginate; leaves pinnatifid to pinnatisect. Inflorescences short racemose or subcapitate. Pedicel 0.5–1.6 cm, slender, pubescent. Leaves alternate or sometimes opposite, many, short petiolate, ovate to oblong, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate. Pedicel well developed. Calyx deeply cleft anteriorly, (3 or)5-lobed. Corolla tube ca. as long as or slightly longer than calyx, straight; galea often dentate; beak slender.

- Five species: endemic to China.
Plants densely pubescent. Leaves ± laxly arranged, to 10 × 3.3 cm, pinnatifid. Inflorescences short racemose or subcapitate, ± laxly arranged. Fl. Sep–Oct.

- Mountainsides; ca. 2600 m. NW Yunnan.


**多叶鹤首马先蒿** 多 ye he shou ma xian hao


Plants sparsely pubescent. Leaves densely arranged. Inflorescences densely arranged, long racemose, to 24 cm. Fl. Jul.

- Alpine meadows; 2800–3000 m. NW Yunnan.

Holmgren suggests that the differences between the three infra-specific taxa may be due to normal variation.


**施氏马先蒿** shi shi ma xian hao

Herbs low, 6–10 cm tall. Roots fibrous. Stems prostrate, several, branching basally. Leaves alternate; petiole 1–1.5 cm, densely reddish ciliate; leaf blade broadly ovate, 1.5–2 × 1.5–2 cm, pinnatifid; segments 4 or 5 pairs, anterior linear, posterior triangular, apex obtuse, incised-dentate. Flowers alternate; bracts leaflike. Pedicel erect, 0.5–2 cm. Calyx campanulate, 1/2 cleft anteriorly; tube membrane, white villous; lobes 5, unequal, leaflike. Corolla pale rose, ca. 1.8 cm; tube 7–8 mm, slightly exceeding calyx; galea curved apically, pubescent abaxially, marginally 2-toothed; beak filiform, ca. 7 mm; lower lip longer than galea, ciliate; middle lobe emarginate. Filaments pubescent, anterior pair more densely so. Fl. Jul, fr. Aug–Sep.

- Grassy openings in *Pinus* forests; 2400–3100 m. C and NW Yunnan.


**林氏马先蒿** lin shi ma xian hao


**糠秕系** kang bi xi

*Ser. Talienses* H. L. Li.

Stems branched basally or unbranched, not drying black. Leaves mostly on stem, alternate, long petiolate; leaf blade often ovate or elliptic, large, pinnatifid to pinnatisept; segments few. Inflorescences laxly racemose or axillary. Calyx deeply to shallowly cleft anteriorly, (2–)5-lobed. Corolla tube ca. as long as to 2 × as long as calyx; beak of galea slender.

Five species: Bhutan, China, India, Myanmar, Nepal, Sikkim; all five in China.

1a. Leaves ± ovate or orbicular, pinnatifid to pinnatipartite.

2a. Middle lobe of lower corolla lip not emarginate apically; calyx slightly cleft anteriorly, lobes large 119. *P. pantlingii*

2b. Middle lobe of lower corolla lip emarginate apically; calyx usually deeply cleft anteriorly, lobes smaller

........................................................................................................................................ 120. *P. furfuracea*

1b. Leaves ± oblong to lanceolate, pinnatisect to pinnatipartite.

3a. Leaf segments 3–5 pairs; filaments sparsely pubescent .............................................................. 116. *P. taliensis*

3b. Leaf segments 5–10 pairs; all filaments glabrous or 2 pubescent.
4a. Calyx 1/2–1/3 cleft anteriorly; lower corolla lip ciliate; galea without auriculate protuberance on each side of margin; all filaments glabrous .............................................................. 117. *P. microcalyx*

4b. Calyx slighty cleft anteriorly; lower corolla lip not ciliate; galea with auriculate protuberance on each side of margin; filaments 2 pubescent .............................................................. 118. *P. hemsleyana*


**大理马先蒿 da li ma xian hao**

Herbs perennial, 15–20 cm tall. Main root stout. Stems soft, erect or ascending, single to several, glabrous or with lines of hairs. Basal leaves withering early. Stem leaves alternate, glabrous; petiole 4–10 mm; leaf blade ovate-oblong, ca. 2 × 1.5 cm, pinnatisect; segments 3–5 pairs, widely spaced, linear-oblong, pinnatifid, dentate, teeth callose. Flowers solitary in leaf axils, widely spaced. Pedicel erect, ca. 2 mm. Calyx campanulate, 3–4 mm, villous, not reticulate, slightly cleft anteriorly; lobes 5–7, triangular, small, sometimes obscure, entire, or the posterior lobe 2- or 3-toothed. Corolla pale rose, ca. 1 cm; tube erect, slightly longer than calyx, expanded apically; galea bent at a right angle apically, pubescent abaxially; beak ± bent downward, ca. 3 mm; lower lip ca. as long as galea, long ciliate, middle lobe hoodlike apically. Filaments sparsely pubescent. Capsule prism-shaped, 2–2.5 × as long as calyx. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows, margins of *Pinus* forests; 2700–3400 m. NW Yunnan.


**小萼马先蒿 xiao e ma xian hao**

Herbs perennial, 10–40 cm tall. Stems slender and flexuous, glabrous or with 2 lines of hairs, branched basally or unbranched. Basal leaves few, withering early; petiole 6–8 cm. Stem leaves few, alternate; petiole 1.5–3 cm; leaf blade lanceolate, 2.5–6 × 1–1.5 cm, abaxially scurfy, adaxially glabrous, pinnatifid and dentate. Inflorescences racemose; bracts leaflike. Pedicel 1–10 mm. Calyx campanulate, 3–4 mm, villous, not reticulate, slightly cleft anteriorly; lobes 5–7, triangular, small, sometimes obscure, entire, or the posterior lobe 2- or 3-toothed. Corolla pale rose, ca. 1 cm; tube erect, slightly longer than calyx, expanded apically; galea bent at a right angle apically, pubescent abaxially; beak ± bent downward, ca. 3 mm; lower lip ca. as long as galea, long ciliate, middle lobe hoodlike apically. Filaments sparsely pubescent. Capsule prism-shaped, 2–2.5 × as long as calyx. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows, margins of *Pinus* forests; 2700–3400 m. NW Yunnan.


**潘氏马先蒿 pan shi ma xian hao**

Herbs perennial, to 30–60 cm tall. Stems often several, densely pubescent apically, branched apically or unbranched; branches slender, pubescent. Leaves alternate; petiole 1–6 cm, pubescent; leaf blade ovate or triangular-ovate, sometimes orbicular, 2.5–5 × 1.5–3 cm, abaxially white scurfy, adaxially sparsely pubescent, pinnatifid to pinnatisect; segments 3–5 pairs, ovate to triangular-ovate, dentate. Inflorescences racemose, interrupted basally; bracts leaflike. Pedicel 1.5–3 mm, elongating in fruit. Calyx campanulate, 6–8 mm, slightly cleft anteriorly, yellow pubescent; lobes 5, unequal or ± equal in size, large. Corolla pale purple or pink, to ca. 1.7 cm; tube ca. 8 mm, ca. as long as or longer than calyx, slightly expanded apically; galea bent at a right angle apically; beak 5–6 mm; lower lip ciliate or glabrous, middle lobe rounded or triangular. Filaments 2 sparsely pubescent, 2 glabrous. Capsule triangular-lanceolate, 1.5–2 cm. Seeds ovoid, ca. 1.5 mm. Fl. Jul–Aug, fr. Aug–Sep.

- Wet boggy places, wet banks in dense mixed forests, alpine meadows; 3500–4200 m. S and SE Xizang, NW Yunnan [Butan, India (Darjeeling), Myanmar, Nepal, Sikkim].

1a. Plants to 30–60 cm tall; leaves 2.5–5 cm; corolla ca. 1.7 cm; calyx lobes unequal; lower corolla lip ciliate, middle lobe rounded ........................................ 119a. subsp. *pantlingii*

1b. Plants barely 30–35 cm tall; leaves ca. 2 cm; corolla barely 1.2 cm; calyx lobes ± equal;
119a. Pedicularis pantlingii subsp. pantlingii
潘氏马先蒿(原亚种) pan shi ma xian hao (yu yan ya zhong)
Pedicularis furfuracea Wallich var. integrifolia J. D. Hooker.
Plants to 30–60 cm tall. Leaves 2.5–5 cm, abaxially white scurfy, adaxially pubescent. Calyx lobes unequal. Corolla ca. 1.7 cm; lower lip ciliate, middle lobe rounded. Capsule triangular-lanceolate, 1.8–2 cm. Wet boggy places, wet banks in dense mixed forests; 3500–4200 m. S and SE Xizang, NW Yunnan [Bhutan, India (Darjeeling), Nepal, Sikkim].

Plants apparently identical to subsp. pantlingii but with capsules ca. 1.5 cm and leaves ± glabrous have been referred to as Pedicularis pantlingii var. brachycarpa P. C. Tsoong (Fl. Reipubl. Popularis Sin. 68: 143. 1963); however, the name is invalid because it lacks a Latin description. Since the minor differences in capsular length and indumentum may be related to growing conditions, further study is required.

缅甸潘氏马先蒿 mian dian pan shi ma xian hao
Plants 30–35 cm tall. Leaves ca. 2 cm. Calyx lobes ± equal. Corolla barely 1.2 cm; lower lip not ciliate, middle lobe triangular.

柳叶系 liu ye xi
Stems erect, branched or not. Leaves opposite, lanceolate to linear, margin entire or obscurely crenate. Inflorescences spicate. Calyx lobes 5, ± equal or sometimes unequal, entire. Corolla tube slightly longer than calyx; galea short, toothless, beakless.
• One species: endemic to China.

柳叶马先蒿 liu ye ma xian hao
Herbs annual, 40–60 cm tall, drying black. Roots fibrous, fascicled. Stems erect, many branched or sometimes unbranched, glabrescent. Leaves sessile, lanceolate to linear, 2–5 cm × 3–10 mm, fleshy, shiny, sparsely long ciliate basally, ± entire, apex acute. Inflorescences 4–10 mm; bracts ciliate, proximal ones linear, longer than flowers, middle and distal ones ovate, shorter than flowers. Calyx 1–1.2 cm, membranous, woolly pubescent; lobes 5, unequal, triangular-lanceolate to triangular, entire, posterior one smallest. Corolla dark rose, 2.2–2.4 cm, glabrous; tube erect, 1.5–1.6 cm; galea 7–8 mm, apex truncate; lower lip 8–10 mm, middle lobe elliptic-ovate, ca. 4 mm, smaller than lateral pair. Filaments villous toward both ends; anthers apiculate. Capsule enclosed by calyx, ovoid, apex acuminate. Fl. and fr. Jul–Sep.
• Open stony pastures, forest margins; 900–3500 m. NW Yunnan.

堅挺系 jian ting xi
Ser. Platyrrhynchae Maximowicz.
Herbs drying black. Stems erect, rigid, usually branched apically. Leaves in whorls of 3 or 4, lanceolate to linear or oblong, pinnatifid to pinnatisect. Inflorescences racemose or spicate. Calyx lobes 5, triangular or lanceolate, entire. Corolla tube 2–3 as long as calyx; galea beakless, with 1 marginal tooth on each side; beak short.
Six species: China, Myanmar, Thailand; four species in China.
1a. Leaves pinnatisect, segments linear ................................................................. 125. P. rigidiformis
1b. Leaves pinnatifid, to nearly entire, segments wider than long.

Herbs perennial, to 60 cm tall, drying black. Stems glabrous or slightly pubescent, usually branched apically, branches in whorls of 3 or 4. Leaves in whorls of 4; petiole ca. 3 mm; leaf blade linear, to 5 cm × 7 mm, leafy, pinnatifid; segments rounded, wider than long, margin double dentate. Inflorescences racemose, many flowered, usually interrupted; bracts leaflike, longer than calyx. Calyx campanulate, ca. 6 mm; lobes 5, triangular, short, long ciliate, entire. Corolla dark red, ca. 2 cm; tube slightly bent basally, ca. 3 × as long as calyx, expanded apically; galea terminating in a short and wide beaklike apex, with 1 short marginal tooth on each side; lower lip slightly longer than galea, middle lobe projecting, much smaller than lateral pair, ± projecting. Posterior 2 filaments sparsely pubescent. Fl. Jul–Sep, fr. Sep–Dec.

Open dry pastures, meadows; 2400–3000 m. SW Sichuan, N, NW, and S Yunnan [Myanmar].


Herbs perennial, to 60 cm tall, drying slightly black. Stems densely pubescent, short branched apically. Leaves usually in whorls of 4; petiole ca. 3 mm; leaf blade linear-oblong to narrowly lanceolate, to 4.5 cm × 8 mm, leathery, pinnatifid; segments wider than long, serrulate, teeth callose. Inflorescences racemose, many flowered, dense; bracts leaflike, longer than calyx. Pedicel short. Calyx campanulate, ca. 5 mm, membranous; lobes 5, triangular, long ciliate, entire. Corolla purplish red, ca. 1.8 cm; tube slightly decurved near calyx lobes, ca. 2 × as long as throat of calyx; galea slightly curved apically, with 1 subulate marginal tooth on each side; lower lip ca. as long as galea, middle lobe much smaller than lateral lobes, ovate, all lobes serrulate. Filaments glabrous. Capsule partly enclosed by calyx, oblong, ca. 7 mm. Fl. Aug–Dec, fr. Sep–Dec.

Stems tall, villous, few branched; branches erect, short, or barely spreading. Leaves in whorls of 4, mostly pubescent; petiole 5–10 mm, winged; basal leaves scalelike; stem leaves ovate, 1.5–2 × ca. 1 cm, pinnatisect; segments linear, crenate. Inflorescences spicate, elongated, interrupted; flowers in whorls of 4, sessile; bracts leaflike, mostly pubescent. Calyx ca. 5 mm, villous; lobes 5, lanceolate, ciliate. Corolla tube cylindrical, glabrous, slightly curved basally; galea bent at a right angle with a marginal tooth on each side; beak filiform; lower lip glabrous, middle lobe projecting, 2-cleft, serrulate, lateral lobes ovate-oblong, margin entire. 2 filaments villous, 2 glabrous. Capsule barely exceeding calyx. Seeds black, ca. 1 mm.

• Guizhou.


• One species: endemic to China.


Herbs perennial, 25–27 cm tall. Stems 5–10, cespitose, dark brown, pubescent. Leaves in whorls of 4; petiole 3–5 mm; leaf blade elliptic to cordate, ca. 2.5 × 1.5–2 cm, pinnatifid; segments oblique, serrate. Inflorescences racemose, dense, 3–5-flowered; bracts flabellate, ca. 1.1 cm × 4–5 mm, apex 3-cleft. Pedicel
ca. 2 mm. Calyx ± saccate, ca. 1.2 cm; lobes 2, navicular, ca. 8 × 5 mm, slightly fine pubescent along veins. Corolla purple, cylindric, ca. 3.1 × 1.2 cm; galea short beaked; lower lip rounded; middle lobe smaller than lateral lobes, barely 3 mm wide, lateral lobes rounded, large. Stamens (4 or)5; filaments densely pubescent. Fl. Aug.


皱褶马先蒿 zhou zhe ma xian hao

Herbs low. Stems unbranched. Basal leaves long petiolate, persistent. Stem leaves in whorls of 4 or lowermost opposite, 1- or 2-pinnatisect. Inflorescences densely spicate. Calyx 1/2 cleft anteriorly, 4- or 5-lobed. Corolla yellow, large; tube decurved near base; galea rounded in front, plicate, toothless, beakless. Anthers apiculate at apex.

- Three species: endemic to China.
  1a. Corolla 1.3–1.4 cm; calyx lobes ± equal, ± entire .......................................................... 129. P. longistipitata
  1b. Corolla 1.6–2.6 cm; calyx lobes unequal, serrate.
    2a. Calyx 9–13 mm; galea 5.5–9 mm ................................................................. 127. P. plicata
    2b. Calyx ca. 8 mm; galea 11–12 mm ............................................................. 128. P. giraldiana


皱褶马先蒿 (原亚种) zhou zhe ma xian hao (yuan ya zhong)

Leaves narrow. Inflorescences sparsely villous. Corolla 1.6–2.6 cm; galea obscurely serrate crested, slightly plicate.

- Alpine regions, among limestone rocks, moist slopes; 2900–5000 m. Gansu, Qinghai, N Sichuan.
- Moist stony pastures; ca. 3700 m. NW Yunnan.


浅黄皱褶马先蒿 qian huang zhou zhe ma xian hao


Leaves wide. Inflorescences densely villos. Corolla ca. 2 cm; galea narrower, truncate at apex.

- Alpine regions, among limestone rocks, moist slopes; 2900–5000 m. Gansu, Qinghai, N Sichuan, SE Xizang, NW Yunnan.


凸尖皱褶马先蒿 tu jian zhou zhe ma xian hao


Leaves narrow. Inflorescences sparsely villos. Corolla to 2.6 cm; galea conspicuously serrate crested, distinctly plicate.

- Moist stony pastures; ca. 3700 m. NW Yunnan.


奇氏马先蒿 qi shi ma xian hao

Pedicularis plicata Maximowicz var. giraldiana (Diels) H. Limpricht.

Herbs perennial, to 25 cm tall, ± drying black. Roots ± fleshy. Stems cespitose; outer stems slender, long whitish pubescent. Leaves in whorls of 4. Basal leaf petiolo long, to 3.5 cm; leaf blade to 3 cm × 9 mm, pinnatisect; segments to 9 pairs, widely spaced, linear-lanceolate, pinnatifid, incised-dentate. Stem leaves in 1 or 2 whorls, similar to basal leaves but shorter petiolo,
glabrous except adaxially pubescent along midvein.
Inflorescences to 7 cm, interrupted basally; bracts leaflike basally, linear-lanceolate apically, shorter than flowers, margin double dentate. Calyx ca. 8 mm, 1/2 cleft anteriorly; lobes 4 or 5, unequal, serrate, densely long whitish pubescent along veins. Corolla yellow, 1.6–2.6 cm; tube decurved through anterior slit of calyx, ca. 1.4 cm; galea 1.1–1.2 cm, narrow, less rounded at apex, obscurely crested; lower lip ca. 1 cm, middle lobe fully projecting and stiped. Anthers apiculate. Fl. Aug, fr. Sep.

- 2900–3000 m. S Shaanxi.


长把马先蒿 chang ba ma xian hao
Herbs perennial, to 20 cm tall, drying slightly black. Roots ± fleshy. Stems few, usually cespitose, central stem erect, outer stems ascending, with 4 lines of hairs. Leaves in whorls of 4. Basal leaves densely cespitose, central stem erect, outer stems ascending, with 4 lines of hairs.


轮叶系 lun ye xi

Herbs annual or perennial, low or tall, sometimes woody. Leaves in whorls of 3 or 4, some opposite proximally, elliptic to lanceolate, pinnatisect or rarely pinnatifid. Inflorescences spicate to racemose. Calyx lobes 5 or sometimes by fusion appearing 3. Corolla usually purple, red, or white, rarely yellow; tube decurved basally; galea toothless, beakless.

About 37 species: Europe, Asia, NW North America; 30 species in China.

1a. Galea of corolla ca. 1/2 as long as lower lip.

2a. Calyx lobes by fusion appearing 3.

3a. Leaf segments 6–9 pairs, linear-oblong to triangular-ovate; capsule triangular-lanceolate, ca. 12 × 4 mm .................................................................................................................. 149. P. holocalyx

3b. Leaf segments 9 or 10 pairs, ovate to oblong; capsule obliquely ovoid, 6–7 × 4 mm .......... 150. P. spicata

2b. Calyx lobes distinctly 5.

4a. Leaves pinnatisect .......................................................... 159. P. lineata

4b. Leaves pinnatifid to pinnatisect.

5a. Filaments glabrous.

6a. Roots single, not fleshy; calyx lobes triangular, ± entire or obscurely serrate 156. P. brachycrania

6b. Roots usually several, fleshy; calyx lobes ovate to oblong, pinnatifid .................. 131. P. roylei

5b. Filaments 2 pubescent.

7a. Plants with clustered fibrous roots; calyx lobes linear-lanceolate ............................ 133. P. likiangensis

7b. Plants with a main root; calyx lobes wider, ± ovate or wider than long.

8a. Crown not scaly; calyx lobes unequal, posterior one triangular, entire ................ 154. P. diffusa

8b. Crown ovate scaly; calyx lobes ± equal, serrate ............................................. 155. P. nyalakensis

1b. Galea of corolla ca. as long as lower lip.

9a. Calyx deeply cleft anteriorly.

10a. Median or sometimes distal bracts subpalmatifid, usually with 3(–5) lobules.

11a. Plants 8 cm tall or more; calyx lobes slender, 2/7–2/5 as long as calyx tube, serrulate; corolla tube decurved at middle; apex of galea not mucronulate ......................................... 134. P. violascens

11b. Plants barely 3 cm tall; calyx lobes triangular, short, barely as long as 1/5 calyx tube, entire; corolla tube decurved ± basally; apex of galea mucronulate ............................................. 137. P. pygmaea

12a. Calyx with obscurely reticulate veins, lobes prominent.
13a. Plants usually woody, many branched apically ................................................. 136. *P. chingii*

13b. Plants herbaceous, unbranched apically.
   14a. Roots fleshy; calyx lobes distinctly lobulate ........................................... 130. *P. rupicola*
   14b. Roots not fleshy; calyx lobes without lobules.
      15a. Leaves 2.5–4 × as long as wide, with 6–10 pairs of segments; corolla more than 10 mm;
      calyx lobes grouped posteriorly; anterior filaments pubescent ... 135. *P. verticillata*
      15b. Leaves less than 2 × as long as wide, with 3 or 4 pairs of segments; corolla 9–10 mm;
      calyx lobes not grouped posteriorly; all filaments glabrous ...... 158. *P. minutilabris*

12b. Calyx with distinct reticulate veins, lobes obscure.
   16a. Proximal segments of leaf blade becoming leafletlike; corolla tube ca. 2.5 mm wide, strongly decurved basally ................................................................. 148. *P. confluens*
   16b. Proximal segments of leaf blade not becoming leafletlike; corolla tube 0.8–1.5 mm wide, slightly decurved basally.
      17a. Leaf segments oblong-triangular; calyx 5-lobed, tube 4.5–5.5 mm, 1/2 cleft anteriorly; filaments 2 sparsely pubescent .............................. 146. *P. transmorrisonensis*
      17b. Leaf segments linear-lanceolate; calyx 3-lobed, tube ca. 3.5 mm, ca. 1/3 cleft anteriorly; filaments 2 villous ................................ ............................ 147. *P. ganpinensis*

9b. Calyx not or slightly cleft anteriorly.
   18a. Plants less than 3 cm tall; calyx lobes distinctly 3-divided ................................. 143. *P. minima*
   18b. Plants more than 3 cm tall; calyx lobes not distinctly 3-lobed.
      19a. Corolla tube ca. 3 × as long as galea; apex of galea ovate, acute .................... 145. *P. altifrontalis*
      19b. Corolla tube ca. 2 × as long as galea; apex of galea rounded or truncate.

20a. Leaves pinnatifid.
   21a. Lower corolla lip ciliate; calyx lobes ± triangular.
      21b. Stems rigid, usually unbranched; calyx ca. 4 mm, lobes ± serrate; plants pubescent ................................................................. 151. *P. szetschuanica*
   21b. Lower corolla lip not ciliate; calyx lobes oblong to lanceolate.
      22a. Filaments 2 or all 4 pubescent.
      23a. Stems usually numerous, cespitose; lobes of lower corolla lip not rounded
      ........................ ................................................................ 152. *P. triangularidens*
      22b. Stems single; lobes of lower corolla lip rounded ............... 153. *P. dolichostachya*
   21b. Stems many branched, branches slender and weak; calyx 2–5 cm, lobes entire; plants glabrous ................................................................. 157. *P. flaccida*

20b. Leaves ± pinnatisect.
   24a. Median and distal bracts subpalmatifid, 3–5-lobulate, slender, fingerlike.
      24b. Bracts pinnatifid or slightly palmatifid, lobes short and rounded.
      25a. Roots ± fleshy; leaves with linear, dentate segments; calyx lobes equal, ± entire
      ................................ ......................................................... 138. *P. anthemifolia*
      25b. Roots ± woody; leaves with lanceolate, pinnatifid or pinnatipartite segments; calyx lobes unequal, serrate ............................................. 139. *P. kansuensis*
   24b. Bracts pinnatifid or slightly palmatifid, lobes short and rounded.
   26a. Filaments 2 or all 4 pubescent.
      27a. Bracts broadly ovate; middle lobe of lower corolla lip ca. 3.5 mm wide ................................................................. 144. *P. tenera*
      27b. Bracts linear-lanceolate; middle lobe of lower corolla lip ca. 2.5 mm wide
      28a. Calyx glabrous; galea not crested; lower corolla lip glabrous,
      apex of lobes not apiculate ........................................... 140. *P. glabrescens*
      28b. Calyx long ciliate; galea narrowly crested; lower corolla lip ciliate, apex of lobes apiculate ............................................. 141. *P. zayuensis*
   26b. Filaments glabrous.
29a. Calyx lobes ca. as long as calyx tube, ± pinnatisect apically, divisions slender ................................................................. 142. P. daucifolia
29b. Calyx lobes much shorter than calyx tube, barely serrate or entire.

30a. Calyx densely whitish villous, lobes ca. 1/3 as long as calyx, unequall, ± ovate-oblong, serrate; galea 5–8 mm ............. 131. P. roylei
30b. Calyx glabrous, lobes ca. 1/5 as long as calyx, ± equal, triangular, ± entire; galea ca. 4 mm .......................................... 132. P. bomiensis


Herbs perennial, (4–)7–17(–22) cm tall, usually drying black. Roots thick, fleshy. Stems numerous, central stem erect, lateral branches erect to ascending, with lines of dense hairs. Leaves in whorls of 4. Basal leaves usually persistent; petiole to 2 cm. Stem leaf petiole short, to less than 5 mm; leaf blade ovate-oblong or oblong-lanceolate, 3–4(–7) cm × 5(–10) mm, villous, pinnatisect; segments 6–9 pairs, ± ovate, pinnatifid, dentate. Inflorescences spicate, 3–8(–12) cm, compact to lax; bracts leaflike, long ciliate. Calyx obliquely ovate, ca. 9 mm, membranous, deeply cleft anteriorly, densely hirsute or only villous along veins and apices; lobes 5, unequal, broadly ovate, distinctly lobulate and serrate. Corolla purple-red, 1.6–2 cm; tube ± bent at a right angle near base; galea slightly falcate, 4.5–6 mm, apex rounded; lower lip 5–7.5 × 7.5–10 mm, middle lobe ca. 1/2 as long as lateral lobes. Filaments glabrous. Capsule ca. 1/2 enclosed by accrescent calyx, 1.5–2.1 cm × 4.8–9 mm, apex acute to acuminate. Seeds ca. 3 mm. Fl. May–Jun, fr. Jul–Aug.

• Alpine meadows, rocky slopes; 2700–4800 m. SW Sichuan, SE Xizang, NW Yunnan.

1a. Plants to 4–20 cm tall; lateral branches usually ascending; inflorescences 3–8 cm, fascicles few, more compactly arranged; bracts and calyx ± densely hirsute; capsule obliquely lanceolate-ovate, 1.5–2 cm × 4.8–9 mm, apex acute ................................................................. 130a. subsp. rupicola

1b. Plants to 20(–22) cm tall; branches erect; inflorescences to 12 cm, fascicles numerous, widely spaced below; bracts and calyx usually glabrous except ciliate margins and apices; capsule long and narrow, ca. 2.1 cm × 6 mm, apex acuminate 130b. subsp. zambalensis

130a. Pedicularis rupicola subsp. rupicola

岩居马先蒿 (原亚种) yan ju ma xian hao (yuan ya zhong)

Plants to 4–20 cm tall. Lateral branches usually ascending. Inflorescences 3–8 cm; fascicles few, compactly arranged; bracts and calyx ± densely hirsute. Corolla purple-red. Capsule obliquely lanceolate-ovoid, 1.5–2 cm × 4.8–9 mm, apex acute. Fl. May–Jun.

• Alpine meadows, rocky slopes; 2700–4800 m. SW Sichuan, SE Xizang, NW Yunnan.

This subspecies includes two forms: f. rupicola with a purple-red corolla and f. flavescens P. C. Tsoong with a yellowish white corolla.


川西岩居马先蒿 chuan xi yan ju ma xian hao


• Alpine meadows. SW Sichuan, NW Yunnan.


罗氏马先蒿 luo shi ma xian hao

Herbs perennial, (4–)7–15 cm tall, ± drying black, pubescent throughout. Roots fleshy, to 4–8 mm in diam. Stems 1 to several, erect or outer ones ascending, with lines of white hairs. Leaves in whorls of 3 or 4. Basal leaves cespitose and persistent; petiole to 3–6 cm. Stem leaves petiole short, barely 2–2.5 cm; leaf blade lanceolate-oblong to ovate-oblong, 2.5–4 cm, pinnatifid; segments 7–12 pairs, lanceolate to oblong, incised-dentate. Inflorescences racemose, to 6 cm, usually interrupted basally; axis densely villous; bracts leaflike, proximal ones slightly longer than flowers. Pedicel ca. 2 mm. Calyx campanulate, 8–9 mm, densely white or deep purple villous, slightly cleft anteriorly; lobes 5, unequal, ± ovate-oblong, ca. 1/3 as long as calyx, serratate or pinnatifid. Corolla purple-red, 1.7–1.9(–2.5) cm; tube decurved basally, 1–1.1 cm, expanded apically; galea slightly falcate, 5–8 mm, rounded in front, margin entire; lower lip 8–9 mm, glabrous. Filaments glabrous. Capsule ovoid-lanceolate, ca. 1.2 cm, short apiculate. Seeds 1.2–1.5 mm. Fl. Jul–Aug, fr. Aug–Sep.

Moist alpine meadows, among small Rhododendron; 3400–5500 m. SW Sichuan, E and SE Xizang, NW Yunnan [Afghanistan, Bhutan, India, Kashmir].

1a. Inflorescence axis, bracts, and calyx villous with dense deep purple hairs; corolla to 2.5 cm, galea to 8 mm .............. 131b. subsp. megalantha
1b. Inflorescence axis, bracts, and calyx without deep purple hairs; corolla 1.7–1.9 cm, galea 5–6 mm.
2a. Roots less than 4 mm in diam.; plants not gray pubescent throughout; basal leaves 2.5–4 cm, segments lanceolate to oblong

................................................. 131a. subsp. roylei
2b. Roots to 8 mm wide; plants usually gray pubescent throughout; basal leaves ca. 2 cm, segments ovate to oblong
................................................. 131c. subsp. shawii

131a. Pedicularis roylei subsp. roylei
罗氏马先蒿(原亚种) luo shi ma xian hao (yuan ya zhong)
Plants not gray pubescent throughout. Roots slender, less than 4 mm in diam. Basal leaves 2.5–4 cm; segments lanceolate to oblong. Inflorescence axis, bracts, and calyx without deep purple hairs. Corolla 1.7–1.9 cm; galea 5–6 mm.

Moist alpine meadows, forests; 3400–5500 m. SW Sichuan, SE Xizang, NW Yunnan [Afghanistan, Bhutan, India, Kashmir].

This subspecies includes two varieties: var. brevigaleata P. C. Tsoong with a shorter galea ca. 1/2 as long as lower corolla lip, and var. roylei with a longer galea, slightly shorter than to ca. as long as lower lip.

大花罗氏马先蒿 da hua luo shi ma xian hao
Inflorescence axis, bracts, and calyx densely deep purple villous. Corolla to 2.5 cm; galea, slightly shorter than to as long as lower lip, to 8 mm.

• Alpine meadows; 4800–5000 m. E Xizang.
萧氏罗氏马先蒿 xiao shi luo shi ma xian hao
Plants usually gray pubescent throughout. Roots thickened, to 10 × 0.8 cm in diam. Basal leaves ca. 2 cm × 8 mm; segments ovate to oblong. Inflorescence axis, bracts, and calyx without deep purple hairs. Corolla 1.7–1.9 cm; galea slightly shorter than to as long as lower lip, 5–6 mm.

• Among small Rhododendron, alpine meadows; 4200–4800 m. E Xizang.

波密马先蒿 bo mi ma xian hao
Herbs perennial, 30–40 cm tall, ± drying black. Roots slightly woody. Stems single, erect, dark purple, often many branched at middle. Leaves in whorls of 4; petiole 5–10 mm; leaf blade ovate to ovate-oblong, to 8 × 4.5 cm, pinnatisect; segments 5–8 pairs, ovate-oblong, pinnatifid to pinnatipartite, incised-dentate, glabrous. Inflorescences racemose, to 12 cm, lax, pubescent; proximal bracts leaflike, distal ones linear. Pedicel 1–3 mm. Calyx campanulate, ca. 5 mm, membranous, slightly cleft anteriorly, glabrous; lobes 5, ± equal, triangular, ca. 1/5 as long as calyx, ± entire. Corolla purplish rose, 1.2–1.4 cm; tube decurved near base, expanded apically; galea slightly falcate, ca. 4 mm; lower lip longer than galea, 8–9 mm wide; lobes rethose, erose, unequal, middle lobe smallest. Filaments glabrous. Capsule slightly exceeding calyx, obliquely ovoid, 6–7 mm. Fl. and fr. Jul–Aug.

• Thickets; ca. 3200 m. E Xizang.

丽江马先蒿 li jiang ma xian hao
Herbs perennial, (3–)9–18 cm tall, ± drying black. Roots fibrous, clustered. Stems 1 to several, central erect, outer ascending, with 4 lines of hairs. Leaves in whorls of 4. Basal leaves numerous, persistent; petiole ca. 3 cm, broadly winged, sparsely ciliate; leaf blade ovate-oblong, to elliptic-oblong, 6–12 × 3–8 mm, pinnatisparte to pinnatissect; segments 4–6 pairs, ovate, pinnate, margin double dentate. Stem leaves 1 or 2 whors, similar to basal leaves, but shorter petiolute; petiole 8–10 mm; leaf blade 0.8–2 cm × 4–10 mm. Inflorescences racemose, to 8 cm, interrupted; bracts leaflike, becoming shorter than flowers apically. Pedicel 1–2 mm. Calyx slightly cleft anteriorly, rust colored villous along veins; lobes 5, ± equal, linear-lanceolate. Corolla pink or red to pale purple-red, 1.4–1.6(–2.5) cm, tube ± bent at a right angle basally; galea 3–4 (–5.5) mm, rounded in front; lower lip ca. 8–10 mm, not ciliate but erose. Filaments 2 villous, 2 glabrous. Capsule ovoid-lanceolate, to 1.4 cm, short apiculate. Fl. Jun–Aug, fr. Sep.

• Alpine meadows, forest margins, grassy slopes; 3200–4600 m. SW Sichuan, E Xizang, NW Yunnan.

1a. Plants (4–)9–18 cm tall; corolla 1.4–1.6 cm, galea 3–4 mm, lower lip ca. 8 mm 133a. subsp. likiangensis
1b. Plants 3(–6) cm tall; corolla to 2.5 cm, galea ca. 5.5 mm, lower lip ca. 10 mm 133b. subsp. pulchra

133a. Pedicularis likiangensis subsp. pulchra
丽江马先蒿(原亚种) li jiang ma xian hao (yuan ya zhong)
Pedicularis lineata Franchet ex Maximowicz var. dissecta Bonati.
Plants (4–)9–18 cm tall. Corolla 1.4–1.6 cm; galea 3–4 mm; lower lip ca. 8 mm.

• Alpine meadows, forest margins; 3200–4600 m. SW Sichuan, E Xizang, NW Yunnan.

美丽丽江马先蒿 mei li li jiang ma xian hao
Plants barely 3–(6) cm tall. Corolla to 2.5 cm; galea ca. 5.5 mm; lower lip ca. 1 cm.


轮叶马先蒿 *jin* se *ma* xian *hao*
*Pedicularis tenuicalyx* P. C. Tsoong.

Herbs perennial, 8–10(–30) cm tall, drying slightly black. Roots ± fleshy and fusiform. Stems 1–10, unbranched, with lines of hairs. Leaves opposite or in whorls of 3 proximally, in whorls of 4 distally. Basal leaves usually persistent; petiole 1–5 cm, narrowly winged; leaf blade lanceolate to linear-oblong, 2.4–4.4 cm × 1.4–14 mm, pinnatisect; segments 6–9 pairs, ovate, pinnatifid, incised-double dentate. Stem leaves similar to basal leaves but shorter petiolate.

Inflorescences 2–6 cm, interrupted usually; bracts broadly rhomboid-ovate, palately 3–5-lobed, margin double dentate. Calyx 6–7 mm, membranous, 2/5 cleft anteriorly; lobes 5, unequal, 2/7–2/5 as long as calyx tube, slender, serrulate. *Corolla* purple-red, ca. 1.7 cm; tube decurved at middle, 1.1 cm; galea ± falcate, 5 mm, rounded serrate. Anterior lobe slightly falcate, 5 мм, rounded in front, longer than lower lip; lower lip barely 4 mm, middle lobe smallest, projecting. Anterior filament pair slightly pubescent. Capsule compressed, lanceolate-ovate, ca. 1.4 cm × 4 mm, obliquely apiculate. Seeds ca. 1.5 × 0.7 mm. Fl. Jul.–Aug, fr. Aug.–Sep.

Rocky mountain slopes, near summits; 4000–4300 m. N Xinjiang [Kazakhstan, Kyrgyzstan].


轮叶马先蒿 *lun* ye *ma* xian *hao*
*Pedicularis calosantha* H. L. Li; *P. menziesii* Bentham; *P. sikangensis* H. L. Li; *P. stevenii* Bunge.

Plants at least partly glabrous. Leaves 1–1.2 cm wide, pinnatifid to pinnatisect; segments 1–2 mm wide. Leaves and calyx lobes ± white, serrulate-denticulate, teeth callose. Calyx lobes usually 3. Corolla small. Capsule narrow.

Mossy and lichenous tundra, alpine pastures, damp places; 2100–4400 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, E Xizang [Japan, Russia; arctic highlands, Europe, NW North America].


唐古特轮叶马先蒿 *tang* gu te *lun* ye *ma* xian *hao*

*Pedicularis calosantha* H. L. Li; *P. tangutica* P. C. Tsoong.

Plants at least partly glabrous. Leaves 1–1.2 cm wide, pinnatifid to pinnatisect; segments 1–2 mm wide. Leaves and calyx lobes ± white, serrulate-denticulate, teeth callose. Calyx lobes usually 3. Corolla small. Capsule narrow.

NE Shanxi [Europe].


宽裂轮叶马先蒿 *kuan* lie *lun* ye *ma* xian *hao*


Plants at least partly glabrous. Leaves 1.2–1.8 cm wide, less deeply pinnatifid; segments 3–4 mm wide. Leaves and calyx lobes ± white, serrulate-denticulate, teeth callose. Calyx lobes usually 3. Corolla small. Capsule narrow.

Gansu, Nei Mongol, Qinghai, Shaanxi, Shanxi, NW Sichuan. 


唐古特轮叶马先蒿 *tang* gu te *lun* ye *ma* xian *hao*


Gansu, Nei Mongol, Qinghai, Shaanxi, Shanxi, NW Sichuan.


秦氏马先蒿 *qin* shi *ma* xian *hao*

Herbs perennial, diffuse, puberulent when young, glabrescent. Stems woody basally, many branched; branches in whorls of 4, 10–20 cm, ascending. Leaves in whorls of 4; petiole ca. 3 cm basally, whitish, pubescent; leaf blade glabrous on both surfaces, pinnatisect; segments 5 or 6 pairs, linear, pinnatifid, incised-dentate. Flowers in whorls of 4; bracts linear.
Pedicel filiform, 1–4 mm. Calyx white, ovate, ca. 5 mm, membranous, pubescent, deeply cleft anteriorly; lobes 5, unequal, posterior one linear, lateral lobes triangular, ciliate. Corolla purple; tube decurved at middle, 4–5 mm; galea erect, 5–8 mm, apex truncate; lower lip longer than galea, 1–1.2 × ca. 1 cm, ciliate; lobes ovate. Filaments 2 pubescent, 2 glabrous. Capsule ca. 2 × as long as calyx, apiculate. Seeds dark, 1–2 × ca. 0.5 mm. Fl. Aug–Sep.
• Woodlands; 3000–4200 m. S Gansu.


侏儒马先蒿 zhu ru ma xian hao
Herbs annual, to 3 cm tall, not drying black. Main root enlarged fusiform, to 2 mm in diam. Stems erect, unbranched, with 4 lines of hairs. Leaves in whorls of 4; petiole of basal leaves 5–7 mm, slender, membranous; leaf blade linear-oblong, ca. 1.5 cm, abaxially sparsely white pubescent, pinnatifid-partite to pinnatisect; segments 6–8 pairs, triangular-ovate, incised-double dentate, teeth white and callos. Inflorescences capitate, dense; bracts leaflike, villous. Calyx ovoid, ca. 4 mm, membranous, densely yellow villous along veins, relatively deeply cleft anteriorly; lobes 5, unequal, triangular, bare 1/5 as long as calyx tube, entire. Corolla purple, 9–10 mm; tube decurved near base, only slightly longer than calyx; galea slightly falcate, ca. 5.5 mm, apex mucronulate; lower lip ca. 4 × 6 mm, middle lobe rounded, smaller than lateral lobes. Filaments glabrous. Fl. Jul, fr. Aug.
• Grassly slopes, river banks; ca. 4000 m. NW Qinghai.


春黄菊叶马先蒿 chun huang ju ye ma xian hao
Herbs perennial, 8–30(–50) cm tall, not drying black. Roots numerous, ± fleshy. Stems 1 to several, erect, unbranched apically, glabrous or with 2–4 lines of hairs. Leaves in whorls of 4. Basal leaf petiole 3–4 cm, slender. Stem leaf petiole 3–5 mm; ± glabrescent; leaf blade ovate-oblong to oblong-lanceolate, 2.5–4 × 1–1.5 cm, glabrescent, pinnatifid-partite; segments 8–12 pairs, widely spaced, linear, dentate; rachis narrowly winged. Inflorescences racemose, 2–8 cm, interrupted, proximal bracts leaflike, shorter than flowers, other bracts 3–5-subpalmatifid-lobed. Pedicel 1–2 mm. Calyx cupular, 3–4 mm, membranous, glabrescent, slightly cleft anteriorly; lobes 5, equal, triangular-lanceolate, 2–3 mm, ± entire. Corolla purple-red, ca. 1.5 cm, tube ± decurved at middle, expanded apically, ca. 1 cm; galea slightly falcate, ca. 5 mm, rounded in front; lower lip ca. as long as galea, glabrous; lobes rounded, middle lobe smallest, apex slightly truncate or emarginate. Posterior filaments pubescent apically; anthers acuminate at base. Fl. May–Jul, fr. Jul–Aug. 2n = 16.
Subalpine grassy slopes; 2000–2500 m. N and W Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (European part, Siberia)].
1a. Plants 8–30 cm tall; corolla relatively small ................................. 138a. subsp. anthemifolia
1b. Plants to 50 cm tall; corolla relatively large ................................. 138b. subsp. elatior

138a. Pedicularis anthemifolia subsp. anthemifolia 春黄菊叶马先蒿(原亚种) chun huang ju ye ma xian hao (yuan ya zhong)
Pedicularis anthemifolia Adams ex Steven; P. hulteniana H. L. Li.
Plants 8–30 cm tall. Corolla small. Subalpine grassy slopes; 2000–2500 m. N Xinjiang [Mongolia, Russia (European part, Siberia)].

甘肃春黄菊叶马先蒿 gan su ma xian hao
Plants to 50 cm tall. Corolla large. W Xinjiang [Kazakhstan, Kyrgyzstan].


甘肃马先蒿 gan su ma xian hao
Herbs annual or biennial, 20–40(–45) cm tall, pubescent throughout, not drying black. Roots single, ± woody. Stems usually several, with 4 lines of hairs. Basal leaves persistent; petiole to 2.5 cm, densely pubescent. Stem leaves in whorls of 4, shorter petiolate; leaf blade oblong, sometimes ovate, to 3 × 1.4(–2) cm, pinnatisect; segments ca. 10 pairs, lanceolate, pinnatifid-partite, dentate, teeth callose. Inflorescences to 25–30 cm, with many whorls, compact to interrupted; proximal bracts leaflike, other bracts 3-palmate. Pedicel short. Calyx ovoid, membranous, slightly cleft anteriorly; lobes 5, unequal, triangular, serrate. Corolla purple-pink to purple-red, sometimes white, ca. 1.5 cm; tube decurved near base, ca. 2 × as long as calyx, expanded apically; galea ± falcate, ca. 6 mm, usually crenulate-crested, apex slightly acute; lower lip slightly longer than galea, lobes rounded, middle lobe smallest, ± emarginate. Filaments 2 pubescent, 2 glabrous. Capsule slightly exceeding calyx, oblquely ovoid, apiculate. Fl. Jun–Aug. fr. Jul–Sep.
• Gravely ground and grassy slopes in subalpine zone, damp grassy areas along field margins, damp slopes, valleys; 1800–4600 m. S and SW Gansu, Qinghai, W Sichuan, E, N, and NE Xizang, Yunnan.
1a. Plants densely white villous throughout ........................................... 139d. subsp. villosa
1b. Plants sparsely white villous throughout.
2a. Plants usually less than 20 cm tall; 
lobes of lower corolla lip distinctly emarginate; basal leaves many; 
inflorescences dense 
............................................. 139c. subsp. kokonorica

2b. Plants usually 20–40(–45) cm tall; 
lobes of lower corolla lip indistinctly 
emarginate; basal leaves fewer; 
infl orescences interrupted.

3a. Plants usually 20–40 cm tall; 
capsule small ...... 139a. subsp. kansuensis

3b. Plants usually taller; capsule larger 
............................................. 139b. subsp. yargongensis

139a. Pedicularis kansuensis subsp. kansuensis

甘肃马先蒿(原亚种) gan su ma xian hao (yuan ya zhong)
Pedicularis futtereri Diels ex Futterer; P. goniantha
Bureau & Franchet; P. szetschuanica Maximowicz var. 
longispicata Bonati ex H. Limpricht; P. verticillata
Linnaeus var. chinensis Maximowicz.

Plants usually 20–40 cm tall, not densely villous 
throughout. Basal leaves few. Infl orescences 
interrupted. Lobes of lower corolla lip indistinctly 
emarginate. Capsule small.
• Gravely ground and grassy slopes in subalpine zone, damp grassy 
areas along field margins, damp slopes; 1800–4600 m. S and SW 
Gansu, Qinghai, W Sichuan, E and NE Xizang.

This subspecies includes two forms: f. kansuensis with a purple-pink 
to purple-red corolla, and f. albiflora

139b. Pedicularis kansuensis subsp. yargongensis (Bonati)


雅江甘肃马先蒿 ya jiang gan su ma xian hao
Pedicularis yargongensis Bonati, Bull. Soc. Bot. France 
55: 312. 1908; P. yargongensis var. longibracteata 
Bonati.

Plants 20–40(–45) cm tall, not densely villous. 
Basal leaves few. Infl orescences interrupted. Lobes of lower 
corolla lip indistinctly emarginate. Capsule to 2 cm.
• W Sichuan, Yunnan.

139c. Pedicularis kansuensis subsp. kokonorica P. C. 

青海甘肃马先蒿 qing hai gan su ma xian hao
Plants usually less than 20 cm tall, not densely villous.
Basal leaves many. Infl orescences dense. Lobes of lower 
• W Qinghai, N Xizang.

139d. Pedicularis kansuensis subsp. villosa P. C. Tsoong, 

厚毛甘肃马先蒿 hou mao gan su ma xian hao
• Valleys; 3500–4400 m. E Xizang.

Philadelphia 100: 317. 1948.

退毛马先蒿 tui mao ma xian hao
Herbs perennial, 10–25 cm tall, glabrescent, ± drying 
black. Roots slightly conical, ± woody. Stems several, ± 
ascending, unbranched, glabrescent. Proximal leaves 
opposite or in whorls of 3, distal ones in whorls of 4; 
petiole to 1.5 cm; leaf blade oblong-lanceolate, 2–3 × 
1–1.5 cm, pinnatisect; segments 6–8 pairs, ovate to 
lanceolate-oblong, widely spaced and 1–3 pairs deeply 
cut basally, dentate; rachis winged. Infl orescences 
spicate, 4–9 cm, interrupted; bracts linear-lanceolate, 
leaflike, proximal ones longer than flowers. Pedicel 
erect, 2–5 mm, slender, glabrous. Calyx obliquely 
broader ovate, membranous, glabrous, slightly cleft 
anteriorly; lobes 5, unequal, broadly ovate, serrate.
Corolla purple, ca. 1.3 cm; tube decurved basally, 8–9 
mm, expanded apically; galea slightly falcate apically, 
not crested, truncate in front; lower lip ca. 5 × 6 mm, 
glabrous, middle lobe rounded, ca. 1/2 as large as 
lateral lobes, ca. 2.5 mm wide. Filaments 2 pubescent, 2 
• Damp slopes; ca. 3500 m. NW Yunnan.

察隅马先蒿 cha yu ma xian hao
Herbs perennial, 20–60 cm tall, ± drying black. Roots 
woody. Stems numerous, central stem erect, outer ones 
± ascending, with 4 lines of hairs. Leaves in whorls of 4. 
Basal leaves densely clustered, persistent; petiole to 3 
cm. Stem leaf petiole 0.5–1.5 cm; leaf blade lanceolate-
oblong to ovate-oblong, 1.5–4 cm, abaxially white 
scurfy, adaxially glabrous, pinnatisect; segments 8–10 
pairs, ovate-oblong, reflexed dentate. Infl orescences 
racemose, elongated to 25 cm; bracts linear-lanceolate. 
Pedicel 1–7 mm. Calyx ovate-oblong, ca. 6 mm, 
membranous, villous-ciliate, slightly cleft anteriorly; 
oboes 5, unequal. Corolla pale red, ca. 1.6 cm; tube 
decurved basally, ca. 1.1 cm, expanded apically; galea 
erect, narrowly crested, slightly rounded in front; lower 
lip longer than galea, ca. 7 mm, middle lobe rounded, 
smaller than lateral lobes, ca. 2.5 mm wide, lobes finely 
ciliate, erose, apex often apiculate. Anterior filaments 
pilose. Capsule slightly oblique, ovoid, apiculate. Fl. Jul, 
• Thickets; ca. 3300 m. SE Xizang.

55: 313. 1908.
胡萝卜叶马先蒿 hu luo bu ye ma xian hao
Herbs perennial, 2–25 cm tall, not drying black. Roots 
obconical. Stems numerous, flexuous, ascending, 
slightly branched basally or unbranched, villous. 
Leaves in whorls of 4; petiole 3–5 mm; leaf blade ovate, 
1–2 cm, glabrous, pinnatisect; segments 10–14 pairs, 
widely spaced, oblong, pinnatifid to pinnatisect, 
linear. Infl orescences spicate, interrupted; bracts 
leaflike. Calyx membranous, glabrous, slightly cleft 
anteriorly; tube 2.5–3 mm; lobes 5, equal, ovate, ca. 2.5
mm, subpinnatisect apically. Corolla tube ca. 2 × as long as calyx, ± bent at a right angle at middle, expanded apically; galea falcate apically, slightly rounded in front, apex slightly angle shaped; lower lip slightly shorter than galea, ca. 4 × 6.5 mm, middle lobe ca. 2 × 3 mm, ca. 2/3 × size of lateral lobes. Filaments glabrous. Capsule narrowly ovoid, 1–1.5 × as long as calyx, apiculate. Seeds nearly dark, 1–1.5 mm.

• W Sichuan.

细小马先蒿 xi xiao ma xian hao
Herbs annual, less than 2.6 cm tall, ± drying black. Roots filiform, slender. Stems 1–3, with 3 or 4 pairs of ovate to lanceolate scales at base, with 4 lines of hairs. Basal leaf petiole ca. 3 × 0.5 mm, glabrous; leaf blade rounded, membranous; segments 2 or 3 pairs, irregularly dentate. Stem leaves in whorls of 3 or 4; petiole to 6 mm, narrowly winged; leaf blade ovate to ovate-oblong, 4–7 cm, abaxially white scurfy, adaxially glabrous, pinnatifid to pinnatisect; segments ca. 5 pairs, ovate, margin lobed. Inflorescences to 2 cm; bracts leaflike, shorter than flowers. Calyx ca. 3 mm, membranous, slightly cleft anteriorly; lobes 5, unequal; posterior one subulate, lateral lobes leaflike, 3-divided. Corolla ca. 1.1 cm; tube decurved ± at middle, ca. 6 mm, slightly expanded apically; galea slightly falcate, rounded in front, apex slightly truncate; lower lip ca. 3.5 × 5 mm, middle lobe rounded, slightly smaller than lateral lobes. Filaments glabrous. Fl. Jul–Aug. fr. Sep.
• NW Sichuan.

细茎马先蒿 xi jing ma xian hao
Herbs perennial, ca. 10 cm tall, slightly pubescent throughout, not drying black. Roots slender, woody. Stems several, dark purple, central stem usually erect or procumbent and ascending, with 4 lines of hairs. Leaves glabrous throughout. Basal leaves few; petiole to 1.8 cm. Stem leaves in whorls of 3 or 4; petiole 5–13 mm; leaf blade lanceolate-oblong to ovate-oblong, 1–2.3 cm × 4–7 mm, pinnatifid to pinnatisect; segments 4–7 pairs, ovate, incised-dentate. Inflorescences 0.2–8.5 cm, interrupted basally; proximal bracts leaflike, distal ones shorter than flowers, broadly ovate, glabrous. Pedicel dark purple, 1.5–10 mm, glabrous. Calyx usually tinged with purple-red, ca. 4 mm, membranous, slightly cleft anteriorly; tube ca. 3 mm; lobes 5, unequal, sparsely purple villous along veins and margins. Corolla purple; tube 9–10 mm, strongly decurved basally, expanded apically; galea falcate, ca. 6 mm; lower lip 6–7 mm, middle lobe ca. 3.5 mm wide, wider than long, lobes ± rounded. Filaments 2 pubescent, 2 glabrous. Fl. Jul–Aug. fr. Aug–Sep.
• Alpine meadows, screes of limestone mountains; 4400–4600 m. W Sichuan.

高萼马先蒿 gao e ma xian hao
Herbs perennial, to 20 cm tall, ± drying black. Roots fleshy. Stems often numerous, outer ones usually ascending, with 4 lines of dense hairs. Leaves in whorls of 4. Basal leaves persisting at anthesis; petiole to 2.5 cm, membranous, sparsely long white ciliate; leaf blade ca. as long as petiole, ovate-oblong to oblong; segments ca. 5 pairs, ovate-oblong, glabrous on both surfaces, incised-dentate. Stem leaves few, similar to basal leaves but smaller; segments ca. 4 pairs. Inflorescences 2.5–3.5 cm; bracts leaflike, shorter than flowers. Calyx ca. 4 mm, membranous, slightly cleft anteriorly; tube ca. 3 mm; lobes 5, unequal. Corolla pale rose, with white throat, 1.3–1.5 cm; tube ± bent at a right angle basally, ca. 3 × as long as galea, slender; galea ca. 4 mm, apex ovate, acute; lower lip ca. 5 × 6.5 mm, middle lobe broadly ovate, smaller than lateral lobes. Filaments glabrous. Fl. May–Jun, fr. Jul–Aug.
• Swampy meadows; 3800–4600 m. SE Xizang.

台湾马先蒿 tai wan ma xian hao
Pedicularis refracta (Maximowicz) Maximowicz var. transmorrisonensis (Hayata) Hurusawa.
Herbs annual, 25–30(–40) cm tall, ± woody at base. Stems unbranched, internodes to 8 cm, with 4 lines of hairs. Leaves in whorls of 4; petiole ca. 3 mm; leaf blade ovate-oblong to lanceolate-oblong, to 2 × 1 cm, abaxially pubescent and slightly scurfy, adaxially sparsely pubescent, pinnatifid to nearly pinnatisect; segments 5–7 pairs, oblong-triangular, cuspidate-dentate, teeth callose. Inflorescences racemose, interrupted basally; bracts leaflike. Pedicel 1–2 mm, glabrous. Calyx 1/2 cleft anteriorly, white villous; tube 4.5–5.5 × ca. 2.5 mm; lobes 5, unequal, ca. 0.5 mm, posterior one triangular, lateral lobes obscure. Corolla red; tube slightly decurved basally, 7–9 mm, slightly expanded apically; galea erect, 5–6 mm, front nearly truncate; lower lip spreading, margin erose, middle lobe ovate, much smaller than lateral lobes. Filaments 2 sparsely pubescent at base, 2 glabrous. Capsule 3/5 enclosed by accrescent calyx, short lanceolate-triangular, ca. 1 cm. Seeds dark, ca. 1 × 0.7 mm.
• Taiwan.

平坝马先蒿 ping ba ma xian hao
Herbs annual or biennial, to 30 cm tall, not drying black. Stems with 4 lines of hairs, internodes to 10 cm basally. Basal leaves withering early; petiole to 1.8 cm, sparsely pubescent. Stem leaves in whorls of 4, short petiolate to sessile, elliptic-lanceolate to oblone-lanceolate, 1.5–2.5 cm × 5–10 mm, abaxially pubescent and white scurfy, adaxially densely white villous, pinnatifid to segments

台湾马先蒿 tai wan ma xian hao
Pedicularis refracta (Maximowicz) Maximowicz var. transmorrisonensis (Hayata) Hurusawa.
Herbs annual, 25–30(–40) cm tall, ± woody at base. Stems unbranched, internodes to 8 cm, with 4 lines of hairs. Leaves in whorls of 4; petiole ca. 3 mm; leaf blade ovate-oblong to lanceolate-oblong, to 2 × 1 cm, abaxially pubescent and slightly scurfy, adaxially sparsely pubescent, pinnatifid to nearly pinnatisect; segments 5–7 pairs, oblong-triangular, cuspidate-dentate, teeth callose. Inflorescences racemose, interrupted basally; bracts leaflike. Pedicel 1–2 mm, glabrous. Calyx 1/2 cleft anteriorly, white villous; tube 4.5–5.5 × ca. 2.5 mm; lobes 5, unequal, ca. 0.5 mm, posterior one triangular, lateral lobes obscure. Corolla red; tube slightly decurved basally, 7–9 mm, slightly expanded apically; galea erect, 5–6 mm, front nearly truncate; lower lip spreading, margin erose, middle lobe ovate, much smaller than lateral lobes. Filaments 2 sparsely pubescent at base, 2 glabrous. Capsule 3/5 enclosed by accrescent calyx, short lanceolate-triangular, ca. 1 cm. Seeds dark, ca. 1 × 0.7 mm.
• Taiwan.

平坝马先蒿 ping ba ma xian hao
Herbs annual or biennial, to 30 cm tall, not drying black. Stems with 4 lines of hairs, internodes to 10 cm basally. Basal leaves withering early; petiole to 1.8 cm, sparsely pubescent. Stem leaves in whorls of 4, short petiolate to sessile, elliptic-lanceolate to oblone-lanceolate, 1.5–2.5 cm × 5–10 mm, abaxially pubescent and white scurfy, adaxially densely white villous, pinnatifid to segments
5–7 pairs, linear-lanceolate, incised-dentate, teeth calllose. Inflorescences spicate, interrupted basally; proximal bracts leaffike, pubescent. Calyx ca. 3.5 mm, 1/3 cleft anteriorly, veins reticulate; lobes 3, unequal, barely 1 mm, posterior one triangular, white villous along veins and ciliate. Corolla purple-red, ca. 1.5 cm; tube slightly decurved basally, expanded apically; galea slightly falcate, rounded in front; lower lip ca. 5.8 × 7 mm, middle lobe much smaller than lateral pair. Filaments 2 villous, 2 glabrous. Capsule obliquely ovoid. Fl. Jun, fr. Jun–Jul.

- Grassy slopes; ca. 1300 m. WC Guizhou.

**148. Pedicularis holocalyx**

Herbs perennial, 20–50 cm tall, drying black. Roots clustered, fibrous. Stems 1–4, often short branched apically, with 4 lines of hairs. Leaves in whorls of 4. Basal leaf petiole to 5 cm. Distal stem leaves ± sessile, ovate-oblong to oblong-lanceolate, 2–5 × 1–1.5 cm, abaxially sparsely villous along veins and often white scurfy, adaxially sparsely pubescent, densely so along midvein, pinnatifid to pinnatisect; segments 4–7 pairs, ovate to oblong-lanceolate or oblong-oblong, winged, lobed or incised-dentate, proximal segments becoming leaf-like. Inflorescences spicate, to 6 cm; bracts leaflike, proximal ones slightly longer than flowers. Calyx ca. 5.5 mm, membranous, 2/5 cleft anteriorly; lobes 3, unequal, posterior one triangular, ca. 1.5 mm; lateral lobes obscure. Corolla red; tube 8–9 × ca. 2.5 mm, basal 2.5 mm strongly decurved, enlarged; galea ca. 5 mm; lower lip longer than galea, 7–8 mm × 1–1.1 cm, middle lobe rounded, smaller than lateral pair. Filaments glabrous. Fl. May, fr. Jun–Jul.

- Bamboo grooves; ca. 1300 m. WC Guizhou.

**149. Pedicularis holocalyx**


连齿马先蒿 lian chi ma xian hao

Herbs annual, more than 50 cm tall, drying black. Roots clustered, fibrous. Stems 1, rarely 2, often short branched apically, with 4 lines of hairs. Leaves in whorls of 3 or 4. Basal leaf petiole to 1 cm, narrowly winged, pubescent; leaf blade oblong-lanceolate to linear-narrowly lanceolate, to 7 × 1.3 cm, abaxially white villous along veins, adaxially sparsely white pubescent, pinnatifid to pinnatisect; segments 9 or 10 pairs, ovate to oblong, dentate or incised-dentate, teeth calllose. Inflorescences spicate, to 12 cm, interrupted basally; proximal bracts leaffike, distal ones rhomboid-ovate or flabellate, white villous. Flowers small. Calyx campanulate, 3–4 mm, slightly cleft anteriorly, membranous; lobes by fusion appearing 3, unequal, posterior one triangular, smaller than lateral pair. Corolla red; tube bent at a right angle basally, 1.2–1.8 cm; galea 3–4 mm, ± acute in front; lower lip 6–10 mm, middle lobe obovate, smaller than lateral lobes. Filaments 2 pubescent, 2 glabrous. Capsule obliquely ovoid to lanceolate-ovoid, 6–10 × ca. 4 mm, apex acute to apiculate. Fl. Jun–Sep, fr. Aug–Oct.

Wet or swampy meadows, thickets; 1500–2600 m. S Gansu, Hebei, Heilongjiang, N Hebei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, N Sichuan [Japan, N Korea, Mongolia, Russia (E Siberia, Far East)].

1a. Capsule narrow, lanceolate-ovoid, 8–10 mm, long apiculate .................. 150c. subsp. stenocarpa

1b. Capsule narrowly ovoid, 6–7 mm, acute.

2a. Distal bracts leaffike or rhomboid-ovate; filaments 2 densely villous 150a. subsp. spicata

2b. Distal bracts strongly enlarged, becoming flabellate; filaments 2 pilose ......................... 150b. subsp. bracteata

**150. Pedicularis holocalyx** subsp. spicata

穗花马先蒿 sui hua ma xian hao

Pedicularis holocalyx var. australis Bonatii; P. zet-schunica Maximowicz var. elata Bonatii.

Herbs annual, more than 50 cm tall, drying black. Stems single, erect, often many branched apically, with 4 lines of hairs. Leaves in whorls of 3 or 4; proximal petioles to 1 cm, winged; leaf blade oblong-lanceolate, 2–5 cm × 0.8–2.3 cm, abaxially glabrous, adaxially sparsely pubescent, pinnatifid; segments 6–9 pairs, linear-oblong to triangular-ovate, incised-dentate. Inflorescences spicate, 2–4(–6) cm; bracts leaffike, proximal ones longer than flowers, distal ones triangular-ovate, long ciliate. Flowers small. Calyx ovoid, ca. 4 mm, membranous; lobes by fusion appearing 3, unequal, posterior one triangular, ca. 0.8 mm, villous along midvein and ciliate. Corolla purplish red; tube strongly bent in calyx, deflexed, ca. 5 mm, straight and gradually expanded apically; galea ca. 2.5–3 mm, margin entire, rounded in front; lower lip spreading, longer than galea, ca. 7 mm, middle lobe rounded, much smaller than lateral lobes. Filaments 2 villous, 2 glabrous. Capsule triangular-lanceolate, ca. 1.2 cm × 4 mm, 1/2 exceeding calyx, short apiculate. Fl. Jun, fr. Jun–Jul.

- Grassy slopes; ca. 2000 m. W Hubei, E Sichuan.

**150. Pedicularis holocalyx** subsp. bracteata

穗花马先蒿 sui hua ma xian hao

Pedicularis holocalyx var. australis Bonatii; P. zet-schunica Maximowicz var. elata Bonatii.

Herbs annual, more than 50 cm tall, drying black. Stems single, erect, often many branched apically, with 4 lines of hairs. Leaves in whorls of 3 or 4; proximal petioles to 1 cm, winged; leaf blade oblong-lanceolate, 2–5 cm × 0.8–2.3 cm, abaxially glabrous, adaxially sparsely pubescent, pinnatifid; segments 6–9 pairs, linear-oblong to triangular-ovate, incised-dentate. Inflorescences spicate, 2–4(–6) cm; bracts leaffike, proximal ones longer than flowers, distal ones triangular-ovate, long ciliate. Flowers small. Calyx ovoid, ca. 4 mm, membranous; lobes by fusion appearing 3, unequal, posterior one triangular, ca. 0.8 mm, villous along midvein and ciliate. Corolla purplish red; tube strongly bent in calyx, deflexed, ca. 5 mm, straight and gradually expanded apically; galea ca. 2.5–3 mm, margin entire, rounded in front; lower lip spreading, longer than galea, ca. 7 mm, middle lobe rounded, much smaller than lateral lobes. Filaments 2 villous, 2 glabrous. Capsule triangular-lanceolate, ca. 1.2 cm × 4 mm, 1/2 exceeding calyx, short apiculate. Fl. Jun, fr. Jun–Jul.

- Grassly slopes; ca. 1300 m. WC Guizhou.

Herbs annual, more than 50 cm tall, drying black. Stems single, erect, often many branched apically, with 4 lines of hairs. Leaves in whorls of 3 or 4. Basal leaves ± in a rosette, smaller than stem leaves, deciduous by anthesis. Stem leaf petiole to 1 cm, narrowly winged, pubescent; leaf blade oblong-lanceolate to linear-narrowly lanceolate, to 7 × 1.3 cm, abaxially white villous along veins, adaxially sparsely white pubescent, pinnatifid to pinnatisect; segments 9 or 10 pairs, ovate to oblong, dentate or incised-dentate, teeth calllose. Inflorescences spicate, to 12 cm, interrupted basally; proximal bracts leaffike, distal ones rhomboid-ovate or flabellate, white villous. Flowers small. Calyx campanulate, 3–4 mm, slightly cleft anteriorly, membranous; lobes by fusion appearing 3, unequal, posterior one triangular, smaller than lateral pair. Corolla red; tube bent at a right angle basally, 1.2–1.8 cm; galea 3–4 mm, ± acute in front; lower lip 6–10 mm, middle lobe obovate, smaller than lateral lobes. Filaments 2 pubescent, 2 glabrous. Capsule obliquely ovoid to lanceolate-ovoid, 6–10 × ca. 4 mm, apex acute to apiculate. Fl. Jun–Sep, fr. Aug–Oct.

Wet or swampy meadows, thickets; 1500–2600 m. S Gansu, Hebei, Heilongjiang, N Hebei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, N Sichuan [Japan, N Korea, Mongolia, Russia (E Siberia, Far East)].

1a. Capsule narrow, lanceolate-ovoid, 8–10 mm, long apiculate .................. 150c. subsp. stenocarpa

1b. Capsule narrowly ovoid, 6–7 mm, acute.

2a. Distal bracts leaf-like or rhomboid-ovate; filaments 2 densely villous 150a. subsp. spicata

2b. Distal bracts strongly enlarged, becoming flabellate; filaments 2 pilose ......................... 150b. subsp. bracteata


- Alpine meadows, grassy slopes, ravines; 3400–4600 m. SW Gansu, SE Qinghai, N and W Sichuan, E Xizang.

**1b.** Plants ca. 10 cm tall; corolla lip entire.

- Plants to 40 cm tall; corolla 1.3–1.7 cm; calyx 4–5.5 mm; leaf segments 3–9 pairs

- Alpine meadows, grassy slopes, ravines; 3400–4600 m. SW Gansu, SE Qinghai, N and W Sichuan, E Xizang.


Four川马先蒿 (yuan ya zhong) *Pedicularis szetschuanica* var. angustifolia Bonati.


**151a.** *Pedicularis szetschuanica* subsp. szetschuanica

四I川马先蒿 (原亚种) *si chuan ma xian hao*


*si chuan ma xian hao* (yuan ya zhong)*Pedicularis szetschuanica* var. angustifolia Bonati.


三角齿马先蒿 *san jiao chi ma xian hao*

Herbs annual, (6–)40 cm tall, not drying black. Roots ± woody. Stems usually numerous, cespitose, unbranched to many branched basally and unbranched apically, densely pubescent to glabrescent. Leaves in whorls of 4. Basal leaf petiole to 2.5 cm, sparsely pubescent. Stem leaf petiole barely 0.5–1.5 cm; leaf blade ovate to linear-oblong or ovate-oblong, 2–3.5 × 0.7–1.8 cm, abaxially long pilose along midvein, adaxially sparsely appressed pubescent, pinnatifid; segments 3–9 pairs, rounded, margin double dentate. Inflorescences spicate, 2–8(–20) cm, interrupted basally; proximal bracts leaflike, rhomboid-lanceolate or ± flabellate, white villous. Calyx (3.5–)4–5.5 mm membranous, slightly cleft anteriorly; lobes 5, unequal, villous along veins, ciliate. Filaments glabrous. Capsule triangular-lanceolate, 1–1.5 cm, apex acute. Fl. May–Jul, fr. Jul–Aug.


狭果穗花马先蒿 *wang mai si chuan ma xian hao*

Herbs annual, (10–)20(–30) cm tall, not woody, pubescent. Leaf blade long ovate to ovate-oblong or oblong-lanceolate, 0.4–3 cm × 2.5–10 mm. Calyx without reticulate veins throughout. Margin of lower corolla lip entire. Filaments 2 pilose, 2 glabrous. Capsule triangular-lanceolate, 0.4–3 cm × 2.5–10–13 mm, pinnatifid; segments 5–11 pairs, ovate to ovobovate, dentate, teeth white and callose, ± white pubescent or glabrescent on both surfaces.

- Alpine meadows, grassy slopes, ravines; 3400–4600 m. SW Gansu, SE Qinghai, N and W Sichuan, E Xizang.
152a. *Pedicularis triangularidens* subsp. *triangularidens*  
三角齿马先蒿 (原亚种) san jiao chi ma xian hao (yuan ya zhong)  

*Pedicularis szetschuanica* Maximowicz var. *ovatifolia*  
H. L. Li.  
Plants to 40 cm tall. Leaf blade with 3–9 pairs of segments. Calyx 4–5.5 mm. Corolla 1.3–1.7 cm.  
• Forests, grassy slopes, river banks, moss-covered forest floor; 2600–3800 m. C and N Sichuan.  

This subspecies has two varieties: var. *triangularidens* with a wider corolla and middle lobe of lower lip narrowly ovate, and var. *angustiloba* P. C. Tsoong with a narrower corolla and middle lobe of lower lip ligulate.  

152b. *Pedicularis triangularidens* subsp. *chrysosplenioides*  
猫眼草三角齿马先蒿 mao yan cao san jiao chi ma xian hao  
Plants ca. 10 cm tall. Leaf blade with 3 or 4 pairs of segments. Calyx to 3.5 mm. Corolla to 9 mm. Fl. Jul–Aug.  
• Coniferous forests; ca. 3600 m. NW Sichuan.  

长穗马先蒿 chang sui ma xian hao  
Herbs more than 20 cm tall. Stems single, erect, unbranched, slightly pubescent or glabrescent. Leaves in whorls of 4; petiole 3–4 mm apically, villous; leaf blade ovate-oblong or linear-oblong, ca. 2.8 × 1 cm, sparsely hisrute, pinnatifid; segments 6–8 pairs, ovate, margin ± entire, apex acute. Inflorescences to 10–15 cm, interrupted basally; bracts leaflike, ca. as long as calyx, pinnatifid. Pedicel erect, 1–3 mm. Calyx broadly ovate, 5–6 mm, membranous, without reticulate veins, sparsely hisrute, scarcely cleft anteriorly; lobes 5, ± equal, triangular, sparsely ciliate, ± entire, apex acute. Corolla purple, ca. 1.3 cm; tube slightly curved in calyx, 7–8 mm, expanded apically; galea slightly curved, ca. 5 mm, rounded in front, margin entire, apex acute; lower lip slightly longer than galea; lobes rounded, middle lobe smaller than lateral pair, projecting, sparsely ciliate. Filaments glabrous. Capsule oblong, ca. 1.8 cm × 4–5 mm, 1/2 exceeding calyx, apiculate. Fl. and fr. Aug.  
• Grassland; ca. 3700 m. W Sichuan.  

铺散马先蒿 pu san ma xian hao  
Herbs to 40–60 cm tall. Roots slender, main root present; crown not scaly. Stems 1 to several, erect or diffuse and ascending, with 4 lines of hairs. Leaves in whorls of 4; petiole 0.5–1.5 cm, white pilose; leaf blade ovate-oblong, 2–2.5(–4.5) × 0.75–1.3 cm, pinnatifid to pinnatisect; segments 5–8 pairs, oblong to linear-oblong, incised-dentate. Inflorescences capitate or to 15–18 cm, interrupted basally. Calyx campanulate, 5–6 (–10) × ca. 3.5 mm, membranous, with sparse reticulate veins throughout, scarcely cleft anteriorly; lobes 5, unequal, posterior one triangular and entire, lateral lobes ovate and incised-serrate. Corolla rose, 1.5–2 cm; tube decurved basally; galea slightly curved, 4–5 mm, rounded in front; lower lip ca. 8 mm, middle lobe obovate, ca. 1/2 as large as lateral lobes, erose-serrulate. Anterior filaments pubescent apically. Capsule lanceolate, apex acute. Fl. and fr. May–Jul.  
Riversides, stony surfaces; ca. 3800 m. S and SE Xizang [Bhutan, C and E Nepal, Sikkim].  

1a. Leaves 2–2.5 cm; calyx 5–6 mm; corolla ca. 1.5 cm, galea ca. 5 mm, more than 1.2 as long as lower lip 154a. subsp. *diffusa*  
b1. Leaves 4–4.5 cm; calyx to 7–10 mm; corolla 1.7–2 cm, galea barely 4 mm, ca. 1/2 as long as lower lip 154b. subsp. *elatior*  

154a. *Pedicularis diffusa* subsp. *diffusa*  
铺散马先蒿 (原亚种) pu san ma xian hao (yuan ya zhong)  
Leaves 2–2.5 cm. Calyx 5–6 mm. Corolla ca. 1.5 cm; galea ca. 5 mm, more than 1/2 as long as lower lip. S Xizang [Bhutan, C and E Nepal, Sikkim].  

高升铺散马先蒿 gao sheng pu san ma xian hao  
Leaves to 4–4.5 cm. Calyx to 7–10 mm. Corolla 1.7–2 cm; galea barely 4 mm, ca. 1/2 as long as lower lip. Fl. Jun.  
• Riversides, stony surfaces; ca. 3800 m. SE Xizang.  

聂拉木马先蒿 nie la mu ma xian hao  
Herbs perennial, 15–30 cm tall, pubescent, drying black. Roots stout, woody, main root present; crown with ovate scales. Stems often numerous, purplish black, central stem erect or all stems procumbent and flexuous or ascending. Leaves in whorls of 4. Basal leaves numerous, persistent; petiole slender, 1–3 cm, pubescent. Stem leaf petiole to 1 cm; leaf blade oblong-lanceolate to oblong, 1.5–3.5 cm, pinnatisect; segments 7–10 pairs, oblong, pinnatifid, dentate, teeth callose. Inflorescences racemose, to 10 cm, interrupted basally; bracts leaflike, shorter than flowers. Pedicel 1–2 mm. Calyx campanulate, 6–8 mm, membranous, densely white pilose; lobes 5, ± equal, serrate, ca. 2/5 as long as calyx. Corolla red or purplish red, with white or pale red throat, ca. 1.3 cm; tube ca. 9–10 mm, ± bent at a right angle medially, expanded apically; galea slightly falcate, 3–4 mm; lower lip longer than galea, ca. 8 mm × 1 cm, middle lobe rounded, smaller than lateral pair, projecting, slightly retuse. Anterior filaments pilose. Fl. Jun–Jul, fr. Aug.  
• Shaded slopes; ca. 3700 m. SE Xizang.  

短盔马先蒿 duan kui ma xian hao
Herbs biennial or perennial, to 30 cm tall. Roots single, small, not fleshy, slightly robust. Stems numerous, erect, slender, unbranched, glabrous or pilose, internode to 12 cm. Basal leaf petiole 1.5–2 cm. Stem leaves in whorls of 3 or 4; petiole 2–7 mm; leaf blade ovate-oblong, ca. 2.5 × 1.3 cm, membranous, glabrous, pinnatisect or -partite; segments 5 or 6 pairs, ovate-oblong, pinnatifid. Inflorescences racemose, to 10 cm, interrupted basally; bracts ovate-oblong or oblong-lanceolate, pinnatisect or pinnatifid. Pedicel 2–3 mm. Calyx broadly ovate, ca. 4 mm, slightly cleft anteriorly, pilose; lobes 5, ± equal, triangular, barely 1 mm, entire or obscurely serrate. Corolla purple, ca. 1.6 cm, glabrous throughout; tube deflexed in calyx; galea truncate or toothed at apex. Filaments glabrous. Fl. May.


Herbs annual, 20–25 cm tall, glabrous. Roots ca. 2 cm. Stems ± ascending, slender, many branched basally and at middle; branches slender, weak. Basal leaves withering early. Stem leaves in whorls of 4. Stems numerous, erect, with 2–4 lines of hairs to glabrescent, slender. Leaves in whorls of 4. Basal leaves withering early; petiole to 15 cm; leaf blade ovate, barely 7 mm, pinnatifid; segments ca. 3 pairs, dentate. Stem leaf petiole ca. 6 mm to ± absent; leaf blade elliptic-oblong to linear-oblong or ovate, 0.7–6 × 0.6–2.5 cm, abaxially sparsely white villous along veins, adaxially sparsely glandular pubescent, pinnatifid; segments 5–8 pairs, ovate to oblong-ovate, margin double dentate, teeth calllose. Inflorescences lax, to 18 cm; bracts often leaflike. Calyx ovate, 4–5.5 mm, membranous, slightly cleft anteriorly, villous along veins; lobes 5, unequal, serrate. Corolla red, 1.5–1.8 cm; tube deflexed, slender, expanded apicily; galea 3–4 mm, 1.2–1.5 mm wide apically, ± rounded in front, apical claw 0.6–8 × 10 mm, middle lobe ovate, slightly smaller than lateral pair, glabrous. Filaments glabrous. Capsule triangular-lanceolate, 1–1.3 cm, apex acute. Seeds elliptic, ca. 1 mm. Fl. Apr–Jul, fr. Jul–Sep.

Forests, alpine meadows; 1900–4600 m. Gansu, S Shaanxi, Sichuan, NW Yunnan [N Myanmar].

159. Pedicularis sparsissima P. C. Tsoong.

Herbs perennial, 20–35–60 cm tall, not drying black. Roots often cespitose, ± conical, slender. Stems 1 to several, slender, with 2–4 lines of hairs to glabrescent, unbranched basally but branched apically; branches slender, opposite or whorled. Leaves in whorls of 3 or 4. Basal leaves decurrent; petiole to 15 cm; leaf blade ovate, barely 7 mm, pinnatifid; segments ca. 3 pairs, dentate. Stem leaf petiole ca. 5 mm to ± absent; leaf blade elliptic-oblong to linear-oblong or ovate, 0.7–6 × 0.6–2.5 cm, abaxially sparsely white villous along veins, adaxially sparsely glandular pubescent, pinnatifid; segments 5–8 pairs, ovate to oblong-ovate, margin double dentate, teeth calllose. Inflorescences lax, to 18 cm; bracts often leaflike. Calyx ovate, 4–5.5 mm, membranous, slightly cleft anteriorly, villous along veins; lobes 5, unequal, serrate. Corolla purple-red, 1.5–1.8 cm; tube decurved, slender, expanded apicily; galea 3–4 mm, 1.2–1.5 mm wide apically, ± rounded in front, apical claw 0.6–8 × 10 mm, middle lobe ovate, slightly smaller than lateral pair, glabrous. Filaments glabrous. Capsule triangular-lanceolate, 1–1.3 cm, apex acute. Seeds elliptic, ca. 1 mm. Fl. Apr–Jul, fr. Jul–Sep.

Forests, alpine meadows; 1900–4600 m. Gansu, S Shaanxi, Sichuan, NW Yunnan [N Myanmar].


55. Ser. Microchilae

Herbs annual or perennial. Leaves in whorls of 3 or 4, elliptic to lanceolate, pinnatisect to pinnatifid. Inflorescence spicate to capitulate. Calyx lobes 5. Corolla ± S-shaped; tube deflexed in calyx; galea truncate or toothed at apex.

Six species: endemic to China.

1a. Leaves pinnatisect to pinnatifid.

2a. Leaves densely pubescent abaxially; apex of galea not toothed; 2 filaments pubescent ...... 160. P. stenotheca
2b. Leaves not pubescent abaxially; apex of galea toothed; all 4 filaments pubescent apically 165. *P. lingelsheimiana*

1b. Leaves pinnatifid or occasionally pinnatipartite, not pinnatisect.

3a. Galea much longer than lower corolla lip; corolla strongly ascending at junction of tube and galea 164. *P. microchilae*

3b. Galea ca. as long as to shorter than lower corolla lip; corolla not strongly ascending at junction of tube and galea, ± straight or slightly curved apically.

4a. Apex of galea toothed.................................................................................................................. 163. *P. metaszetschuanica*

4b. Apex of galea not toothed,

5a. Herbs annual; roots conical; basal leaves often withering early; inflorescences not purplish red pilose ................................................................................................................................. 161. *P. angularis*

5b. Herbs perennial; roots fascicled, filiform; basal leaves persistent; inflorescences purplish red pilose........................................................................................................................................ 162. *P. fragarioides*


狭室马先蒿 xia shi ma xian hao

Herbs perennial, to 20 cm tall, drying slightly black. Roots ± woody. Stems 1 to several, with 4 lines of hairs. Leaves in whorls of 4. Basal leaf petiole ca. 2.5 cm, white villous. Stem leaves in 2 or 3 whorls; petiole 0.5–1.5 cm; leaf blade oblong-lanceolate to ovate-lanceolate, 1.8–2.2 cm × 8–10 mm, abaxially densely white scurfy and white pilose along veins, adaxially hoary along midvein, pinnatifid to pinnatisect; segments 3–9 pairs, ovate to linear-lanceolate, pinnatifid or incised-dentate. Inflorescences ± capitulate, 1–2 cm, white pilose; bracts leaflike, proximal longer than flowers, distal shorter than flowers. Calyx ca. 5 mm, barely cleft anteriorly; lobes 5, unequal, posterior one smaller than lateral lobes, triangular and entire, lateral lobes ovate, serrate. Corolla 1.1–1.2 cm; tube slightly decurved basally, slightly expanded apically; galea barely 3 mm, only ca. 1/2 as long as lower lip, rounded in front, truncate at apex, not toothed; lower lip ca. 6 × 8 mm, lobes retuse and erose, middle lobe rounded, ca. 1/2 as large as lateral pair. 2 filaments pubescent. 2 glabrous. Capsule narrowly triangular-lanceolate, ca. 1.5 cm, apiculate. Fl. and fr. Jun–Jul.

- Grassy banks in coniferous forests; ca. 3900 m. C and E Xizang.


角盔马先蒿 jiao kui ma xian hao

Herbs annual, 15(–40) cm tall, not drying black. Roots conical, small, ± woody. Stems single and erect, but several and ascending, often densely white or pale brown villous. Leaves in whorls of 4. Basal leaves often withering early; petiole 0.7–2 cm, densely villous. Stem leaves in 2(3) whors, shorter petiolate; leaf blade ovate to ovate-oblong or narrowly oblong, 0.7–2 cm × 4–10 mm, abaxially densely strigose, adaxially densely villous along veins, pinnatifid; segments 6–10 pairs, margin lobed and double dentate. Inflorescences spicate, to 4 cm, interrupted basally; axis densely villous; proximal bracts leaflike. Calyx 4–5 mm, densely villous along veins; lobes 5, unequal, posterior one smallest, triangular; lateral lobes long ovate, ca. 1.5 mm. Corolla pale red, ca. 1.5 cm; tube strongly decurved basally, expanded apically; galea barely 3.5–4 mm, shorter than lower lip, apex rounded, angulate in front, not toothed; lower lip ca. 6 × 8.5 mm, lobes obovate and retuse, middle lobe smallest. Filaments glabrous. Fl. Jun–Jul, fr. Aug.

- Slopes; ca. 3800 m. NW Sichuan.


草莓状马先蒿 cao mei zhuang ma xian hao

Herbs perennial, usually less than 10 cm tall, ± drying black. Roots fascicled, filiform, fleshy. Stems usually decumbent or ascending, often many branched basally and at middle, densely pale brown pilose. Basal leaves purple-black, persistent; petiole filiform, to 3 cm, 3–4 × as long as leaf blade; leaf blade broadly ovate-cordate to elliptic-cordate, pinnatifid; segments 3–6 pairs, broadly ovate, margin lobed or double dentate. Stem leaves often opposite or occasionally in whors of 4, shorter petiolate; leaf blade narrow, abaxially white hirsute along veins, adaxially sparsely appressed pilose; segments ca. 5 pairs. Inflorescences capitate, densely purplish red pilose; bracts purplish red, much shorter than flowers, purplish villous. Calyx ca. 6 mm, membranous, 2.5–3 mm, scarcely cleft anteriorly, tinged with red, purplish villous; lobes 5, 1.7–2 mm, unequal. Corolla purplish red, 1.5–1.6 cm; tube decurved basally; galea ca. 4.5 mm, apex truncate, not toothed; lower lip ca. 6 mm × 1.1 cm, lobes ovate, ± equal, praeorsus-serrate. Filaments glabrous. Fl. Aug–Sep, fr. Sep.

- Stony slopes; ca. 4700 m. NW Sichuan.


后生四川马先蒿 hou sheng si chuan ma xian hao

Herbs annual, to 25 cm tall, ± drying black. Roots conical, woody. Stems 1–7, outer stems ± ascending,
white villous. Basal leaves ± persistent; petiole 1–1.5 cm, slender, white villous; leaf blade oblong to lanceolate, to 1 cm × 2.5–4 mm, pinnatifid; segments 4–6 pairs. Stem leaves in whorls of 4, shorter petiolate; leaf blade slightly larger than basal leaves, abaxially white villous along veins, adaxially appressed white crispatel-pilose; segments ca. 6 pairs. Inflorescences spicate, 3–6 cm, interrupted basally; proximal bracts leaflike, densely villous. Calyx 4–6 mm, membranous, slightly cleft anteriorly; lobes 5, triangular, short, ± unequal. Corolla red-purple, ca. 1.5 cm; tube decurved basally, expanded apically; galea 5.5–6.5 mm, apex rounded, with 1 marginal filiform tooth on each side; lower lip ca. 6 × 7–9 mm, middle lobe broadly ovate, slightly smaller than lateral pair. Filaments glabrous. Fl. Jul–Aug, fr. Jul–Sep.


xiao chun ma xian hao

Herbs annual, to 40 cm tall, not drying black. Roots slender. Stems 1–5, erect or outer stems slightly ascending, weak, glabrescent. Leaves few; basal leaves withering early. Proximal stem leaves opposite; petiole to 2 cm, middle and distal ones in whorls of 4, short petiolate to sessile; leaf blade oblong to elliptic or ovate, 1–2(–3.5) cm, glabrous on both surfaces, pinnatifid; segments 6–10 pairs, ovate, incised-lobed or double dentate. Inflorescences spicate, interrupted; bracts leaflike to ovate-lobate, short petiolate. Calyx ca. 4.5 mm, slightly cleft anteriorly; lobes 5, ± equal, triangular-ovate, obscurely serrate, pilose along veins and serrate. Corolla strongly ascending at junction of tube and galea, pale red, with purple galea, ca. 2 cm; galea slightly falcate, 9–10 mm, much longer than lower lip, apex toothed or not; lower lip ca. 7 mm. Filaments glabrous. Capsule narrowly ovoid-triangular, to 1.4 cm, ca. 1/2 exceeding calyx, apiculate. Fl. Jun–Aug, fr. Jul–Sep.

Herbs less than 30 cm tall, pilose. Stems branched apically, sparsely pilose. Proximal leaves in whorls of 3, middle and distal ones opposite or whorled, long petiolate; leaf blade lanceolate or elliptic, pinnatisect; segments ovate, pinnatifid, incised-dentate. Inflorescences spicate; bracts pinnatisect. Calyx campanulate; lobes 5, unequal, 2 lobes larger than others, rounded, incised-serrate. Corolla rose; tube decurved in calyx, ca. 3 x as long as calyx; galea slightly falcate, apex rounded, with 1 marginal subulate tooth on each side; lower lip slightly longer than galea, lobes oblrate, middle lobe placed slightly apically. Filaments pubescent apically.

Herbs less than 30 cm tall, pilose. Stems branched apically, sparsely pilose. Proximal leaves in whorls of 3, middle and distal ones opposite or whorled, long petiolate; leaf blade lanceolate or elliptic, pinnatisect; segments 6–8(–13) pairs, ovate, incised-dentate or double dentate. Corolla strongly ascending at junction of tube and galea, pale red, with purple galea, ca. 2 cm; galea slightly falcate, 9–10 mm, much longer than lower lip, apex toothed or not; lower lip ca. 7 mm. Filaments glabrous. Capsule narrowly ovoid-triangular, to 1.4 cm, ca. 1/2 exceeding calyx, apiculate. Fl. Jun–Aug, fr. Jul–Sep.


3b. Galea distinctly serrate crested in front ................................ ............................................. 169. P. globifera
3a. Galea not serrate crested in front ................................ .......................................................... 169. P. globifera


碎米蕨叶系 sui mi jue ye xi

Ser. Ophiocaphae Prain.

Herbs perennial. Roots ± fleshy. Stems unbranched or with erect rigid branches. Basal leaves usually cespitose, persistent. Stem leaves in whorls of 4, pinnatisect. Inflorescences subcapitate to spicate or racemose. Calyx deeply cleft anteriorly, 3- or 5-lobed. Corolla yellow, white, or red; tube ca. as long as calyx or shorter, decurved in calyx; lobes oblate, rounded, incised-serrate. Corolla rose; tube decurved in calyx, ca. 3 x as long as calyx; galea slightly falcate, apex rounded, with 1 marginal subulate tooth on each side; lower lip slightly longer than galea, lobes oblrate, middle lobe placed slightly apically. Filaments pubescent apically.


碎米蕨叶马先蒿 sui mi jue ye ma xian hao

Herbs perennial, 5–30 cm tall, drying slightly black. Roots fusiform. Stems single and erect or more than 10, unbranched, with 4 lines of hairs. Basal leaf petiole to 3–4 cm. Stem leaves in whorls of 4; petiole 0.5–2 cm; leaf blade linear-lanceolate, 0.7–4 cm × 2.5–8 mm, pinnatisect; segments 8–12 pairs, ovate-lanceolate to linear-lanceolate, pinnatifid, double dentate or incised-dentate. Inflorescences subcapitate or spicate and elongated to 10 cm, sometimes interrupted basally; bracts leaflike, ca. as long as flowers basally. Pedicel ± sessile. Calyx 8–9 mm, ca. 1/3 cleft anteriorly, densely pilose along veins; lobes 5, unequal, posterior one triangular, entire, lateral lobes larger, serrate. Corolla purple-red to
white, sometimes yellow; tube almost erect when young, 
becoming bent at a right angle basally, to 1.1–1.4 cm; 
galea falcate, ca. 1 cm, apex with a short conical beak 
or beakless; lower lip 8–10 mm × 1–1.2 cm, lobes 
rounded. Filaments sparsely pubescent basally, 
glabrous apically. Capsule lanceolate-triangular, ca. 1.6 
cm × 5.5 mm, ca. 1/2 exceeding calyx. Seeds ca. 2 mm. 
Stony and gravelly slopes near summits, grassy slopes and banks, 
damp sandy areas along streams, Betula forests; 2100–5200 m. E, SW, 
and W Gansu, Qinghai, Xinjiang, N and W Xizang [Afghanistan, 
India, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan].

1a. Leaves with narrow segments; calyx lobes 
short; corolla limb without purplish dots

1b. Leaves with wide segments; calyx lobes 
long; corolla limb with purplish dots

166a. Pedicularis cheilanthifolia subsp. cheilanthifolia

碎米蕨叶马先蒿 (原亚种) sui mi jue ye ma xian hao

(yuan ya zhong)

Leaves with narrow segments. Calyx lobes short.
Corolla purple-red to white or yellow; lower lip without 
purplish dots, ca. 8–10 mm × 1–1.2 cm, slightly shorter 
than galea.
Stony and gravelly slopes near summits, grassy slopes and banks, 
damp sandy areas along streams, Betula forests; 2100–4900 m. E, SW, 
and W Gansu, Qinghai, Xinjiang, N Xizang [Afghanistan, India, 
Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan].
This subspecies includes var. isochila Maximowicz with a yellow 
corolla, lower lip ca. 1 × 1.2 cm, ca. as long as galea.

166b. Pedicularis cheilanthifolia subsp. svenhedini

1963.

斯文氏碎米蕨叶马先蒿 si wen shi sui mi jue ye ma 

xian hao

Pedicularis svenhedini Paulsen in Hedin, S. Tibet 6: 44. 
1921.
Leaves with wide segments. Calyx lobes long. 
Corolla purple-red to white; limb often with purplish dots. 
lower lip ca. 8 mm × 1 cm, slightly shorter than galea.
4500–5200 m. W Xizang [India].

167. Pedicularis kawaguchii


喀瓦谷池马先蒿 ka wa gu chi ma xian hao
Herbs 20–30 cm tall. Stems erect, unbranched, with 
4 lines of hairs. Leaves in whorls of 4; petiole 1–2 cm; 
leaf blade oblong-lanceolate, 2.5–4.5 cm × 5–10 mm, 
glabrous on both surfaces except adaxially short 
pubescent along midvein, pinnatisect; segments 10–15 
pairs, oblong, shallowly crenate-dentate. Racemes 7–9 
× 3–4 cm, many flowered; proximal bracts leaflike, 
distal ones lanceolate or linear, ca. as long as calyx, 
sparsely white pilose. Pedicel ca. 1.5 mm, sparsely 
pilose. Calyx tubular, ca. 7 × 3 mm, 1/3 clef anteriorly, 
sparsely white pilose; lobes 3, unequal, 1.5–2 mm, 
posterior one ob lanceolate, lateral pair larger, broadly 
flabellate, apex 2-cleft, serrate. Corolla ca. 2 cm; tube 
decurved in calyx, expanded apically, ca. 2 x as long 
calyx; galea incurved, ca. 8 mm, beak less than 1 mm 
wide; lower lip ca. 1 × 1.3 cm, middle lobe oblate, 
slightly smaller than lateral lobes. Filaments glabrous. 
Fl. Jun.
• S Xizang.

168. Pedicularis latirostris


宽喙马先蒿 kuan hui ma xian hao
Herbs perennial, 12–24 cm tall. Roots fusiform. Stems 
often single, with 4 lines of hairs. Basal leaf petiole ca. 
2.5 cm. Stem leaves in whorls of 4; petiole to 1.3 cm, 
sparsely pilose or glabrous; leaf blade narrowly oblong 
to linear-oblong, 1–1.5 cm, pinnatisect; segments 6–8(– 
13) pairs, ovate to lanceolate, pinnatifid to incised-
dentate. Inflorescences capitate to short spicate, 2–5 cm; 
bracts leaflike basally. Calyx ca. 8 mm, 1/2–2/3 clef 
 anteriorly; lobes 5, unequal, densely pilose along veins 
and ciliate. Corolla yellow, ca. 2 cm; tube slightly 
decurved at middle, ca. 1 cm; galea strongly falcate 
apically, ca. 1 cm; beak slightly truncate and rounded, 
to 1.8 mm wide; lower lip ca. 6 mm × 1.2 cm, middle 
lobe ovate-triangular, smaller than lateral pair.
Filaments 2 sparsely pubescent near apex, 2 glabrous 
• Moist grassy meadows; ca. 3800 m. S Gansu.

169. Pedicularis globifera


球花马先蒿 qiu hua ma xian hao
Herbs perennial, ca. 10(–25) cm tall. Stems cespitose, 
to more than 10, central stem ± erect, outer stems 
strongly procumbent to ascending, with 4 lines of hairs. 
Basal leaf petiole 2–5 cm. Stem leaves in whorls of 4, 
short petiolate; leaf blade linear-lanceolate, smaller than 
basal leaves, to 3 × 1 cm, pinnatisect; segments 10–18 
pairs, widely spaced, lanceolate to linear, lobed or 
dentate, teeth callose. Inflorescences often densely 
spicate, to 6 cm. Calyx oblong-campanulate, 8–9 mm, 
1/3 cleft anteriorly, densely pilose along veins; lobes 5, 
unequal, posterior one triangular, entire, lateral lobes 
larger, serrate. Corolla red to white; tube ca. 1.2 cm; 
galea ± falcate or erect, 8–9 mm, rounded in front, 
distinctly serrate crested; beak short, apex truncate, less 
than 1 mm wide. Filaments glabrous. Capsule ovoid-
lanceolate, ca. 1.4 cm × 5 mm, apiculate. Fl. and fr. 
Jun-Oct.
Swampy alpine Kobresia meadows, boggy places along rivers and 
streams, grassy areas, grass of parks and gardens; 3600–5400 m. S 
and SE Xizang [Nepal, Sikkim].

170. Pedicularis anas

Saint-Pétersbourg 32: 578. 1888.

鸭首马先蒿 ya shou ma xian hao
Herbs perennial, (4.5–)10–30(–40) cm tall, slightly 
pilose, drying black. Stems 1 to several, dark purple, 
usually unbranched, or occasionally branched distally,
with 4 lines of hairs. Basal leaves glabrous; petiole 1.5–2.5 cm. Stem leaves in whorls of 4, short petiolate or sessile; leaf blade oblong-ovate to linear-lanceolate, glabrous on both surfaces, pinnatisect; segments 7–11 pairs, pinnatifid, spinose-dentate. Inflorescences capitately to spicate; proximal bracts leaflike. Calyx often with purplish dots or tinged with purple, glabrous or villous; lobes 5, unequal, posterior one 3–serrate apically, lateral lobes larger, serrate, densely downy-ciliate. Corolla purple with dark purple-red galea and pale yellow lower lip; beak short; lower lip large. Fl. Jul-Sep, fr. Aug-Oct.

1a. Corolla yellow ........................................ 170a. var. anas

鸭首马先蒿 (原变种) ya shou ma xian hao (yuan bian zhong)

1b. Corolla purple or with pale yellow lower lip and dark purple-red galea.

2a. Lower corolla lip large; beak of galea short ........................................ 170a. var. anas

2b. Lower corolla lip smaller; beak of galea longer ........................................ 170b. var. tibetica

57. Ser. Caucasicae

高加索系 gao jia suo xi
Herbs low. Stem leaves few, opposite or whorled. Inflorescences elongated to capitately, densely flowered. Calyx large, 5-lobed. Corolla tube strongly curved apically; galea toothless or beaked. Anthers acuminate.


赛氏马先蒿 sai shi ma xian hao
Pedicularis pycnantha Boissier var. semenowii (Regel) Prain.
Herbs perennial, 2–5(–10) cm tall. Roots fleshy. Stems single to few, unbranched, sparsely lanulose. Proximal leaves opposite, with petiole longer than leaf blade, distal ones whorled, ± sessile, sparsely lanulose; leaf blade linear-lanceolate, pinnatisect; segments oblong, pinnatisect, serrate-dentate. Inflorescences capitate; proximal bracts leaflike, shorter than flowers. Pedicel ca. 1.5 cm. Calyx campanulate, inflated in fruit, 1–1.7 cm; lobes 5, lanceolate-linear, serrulate. Corolla purplish rose or white and rose, 2.2–3 cm; galea slightly S-shaped apically; lower lip ca. as long as galea, 7–10 mm, middle lobe rounded, slightly smaller than lateral pair. Filaments 2 sparsely pubescent, 2 glabrous. Capsule obliquely ovoid, 1.2–1.5 cm. Fl. May–Jun, fr. Jun-Jul.

Steppes, stony and rocky slopes; 2700–4500 m. Xinjiang, Xizang [Afghanistan, India, Kazakhstan, Kyrgyzstan].

58. Ser. Molles

柔毛系 rou mao xi
Stems several together, erect or ascending, often branched apically. Leaves in whorls of 3–5, pinnatisect. Stem leaves numerous. Inflorescences long spicate, interrupted. Calyx lobes 5. Corolla small; tube slightly curved at middle; galea toothless or beaked.

One species: Bhutan, China, Nepal, Sikkim.

172. Pedicularis mollis Wallich ex Bentham, Scroph. Ind. 53. 1835.

柔毛马先蒿 rou mao ma xian hao
Herbs annual, (15–)30–80 cm tall, villous, not drying black. Stems erect, leafy. Stem leaves in whorls of 3 or 4; proximal petioles short; leaf blade linear-lanceolate, 3–5 cm × 7.5–10 mm, pinnatisect; segments 10–15 pairs, lanceolate, pinnatifid, with ovate divisions, dentate. Inflorescences often interrupted basally; bracts leaflike. Pedicel short. Calyx campanulate, ca. 6 mm,
tomentose; lobes 5, lanceolate, serrulate. Corolla red, 7–9 mm; tube ca. 5 mm, pubescent; galea erect, slender, apex acute but beakless; lower lip shorter than galea, spreading, ca. 5.5 mm wide, lobes rounded, equal, ciliate. Filaments glabrous. Capsule ovoid-lanceolate, ca. 1.2 cm × 5.5 mm, ca. 2 × as long as calyx, obliquely apiculate. Fl. and fr. Jul–Sep. 2n = 16.

Sand dunes along beaches, field margins, dry ground; 3000–4500 m. S Xizang [Bhutan, Nepal, Sikkim].


Herbs low. Stems flexuous or diffuse, slender. Stem leaves opposite or whorled, ovate-lanceolate to ovate-oblong, pinnatifid to pinnatipartite to pinnatissect. Inflorescences lax. Calyx lobes 5, unequal. Corolla small, tube slightly longer than calyx, decurved apically; galea lacking marginal teeth, forming a very short obtuse beak apically.

Two species: Bhutan, China, Sikkim; one species in China.


远志状马先蒿 yuan zhi zhuang ma xian hao

Herbs 2–8 cm tall, drying slightly black. Roots filiform. Stems with 2 lines of hairs. Basal leaves clustered, withering early; petiole 5–10 mm. Stem leaves opposite or occasionally in whorls of 3 or 4; petiole 2.5–5 mm or sometimes sessile; leaf blade ovate to ovate-oblong, 7.5–10 × ca. 2.5 mm, pinnatifid to incised-dentate. Flowers axillary, proximal ones lax, distal ones dense;


蒿叶系 hao ye xi

Stems branched or not. Leaves whorled, proximal ones sometimes opposite, oblong to lanceolate, pinnatifid to pinnatissect. Flowers laxly or compactly arranged in spikes. Calyx lobes 5. Corolla tube bent forward apically; galea ± truncate at apex, lacking marginal teeth, beakless to short beaked.

About six species: China, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; five species in China.

1a. Corolla tube bent in calyx tube, 12–14 mm ................................................................. 177. P. brevilabris

1b. Corolla tube bent forward apically, above calyx lobes, 6–8(–14) mm.

2a. Corolla tube much longer than galea.

2b. Corolla tube more than 2 × as long as calyx; 2 filaments pubescent; galea conical, short beaked 178. P. ludwigii

3a. Corolla tube slightly longer than calyx; filaments glabrous; galea slightly protracted at apex, ± square short beaked ................................................................. 174. P. abrotanifolia

3b. Lower corolla lip ciliate; filaments 2 pubescent ................................ 175. P. densisipica

4a. Lower corolla lip not ciliate; filaments glabrous ......................................................... 176. P. obscura

Dry rocky slopes, grassy slopes, sometimes in moist meadows. Xinjiang [Kazakstan, Mongolia, Russia (W Siberia)].


密穗马先蒿 mi sui ma xian hao

Herbs annual, erect, 15–60 cm tall, not drying black. Stems many branched basally or unbranched, with 4 lines of hairs. Leaves opposite or distal ones in whorls of 3 or 4, sessile or petiole to 5 mm, villous; leaf blade long ovate to ovate-oblong, 2–5 × 0.7–1.5 cm, pubescent on both surfaces, pinnatipartite to pinnatissect; segments 6–10 pairs, linear to linear-oblong, incised-dentate. Inflorescences spicate, very dense, to 6.5 cm, sometimes interrupted basally; proximal bracts leaflike, distal ones long ovate, shorter than to 1–3 × as long as flowers, entire. Calyx 5–8 mm, shallowly cleft anteriorly, membranous, densely pubescent along veins; lobes 5, unequal, densely pub-
escent; posterior one smallest, entire, others serrate. Corolla rose to pale purple, 1.3–1.6 cm; tube erect basally, slightly curved apically, 6–8 mm; galea sometimes yellowish green, 8–9 mm, apex acute; lower lip 6–10 mm, spreading, ciliate, middle lobe smaller than lateral pair, ovate. Anterior filament pair densely pubescent. Capsule ovoid, ± compressed, 0.8–1.2 cm, obliquely short apiculate. Fl. Apr–Sep, fr. Aug–Oct.

- Swampy or alpine meadows, forests; 1900–4400 m. W Sichuan, S and SE Xizang, NW Yunnan.

1a. Plants 15–40 cm tall; bracts shorter than flowers, ca. 8 mm; lower corolla lip ca. as long as galea

1b. Plants to 60 cm tall; bracts 2–3 × as long as flowers; lower corolla lip slightly longer than galea.

2a. Plants ± pubescent; corolla galea rose to purple ....................... 175b. subsp. schneideri

2b. Plants usually glabrous; corolla galea yellowish green ........ 175c. subsp. viridescens

175a. Pedicularis densispica subsp. densispica

密穗马先蒿 (原亚种) mi sui ma xian hao (yuán ya zhòng)

Plants 15–40 cm tall. Bracts shorter than flowers, ca. 8 mm. Lower lip ca. as long as galea. Fl. Apr–Jul.

- Swampy meadows, forests; 1900–4400 m. W Sichuan, SE Xizang, NW Yunnan.


许氏密穗马先蒿 xu shì mi sui ma xian hao


Plants to 60 cm tall, ± pubescent. Bracts 2–3 × as long as flowers. Corolla 1.3–1.6 cm; galea rose to purple; lower lip slightly longer than galea. Fl. Jun–Aug.

- Alpine meadows; 2700–3500 m. SW Gansu, NW and S Sichuan.


绿盔密穗马先蒿 lǜ kuī mi sui ma xian hao

Plants to 60 cm tall, usually glabrous. Bracts 2–3 × as long as flowers. Corolla ca. 1.6 cm; galea yellowish green; lower lip slightly longer than galea. Fl. Jun–Jul.

- SE Xizang.


暗斑马先蒿 an mèi ma xian hao

Herbs perennial, pubescent. Stems erect or ascending to repent, many branched; branches diffuse, 0.8–1.4 cm, with 2–4 lines of villous hairs or pubescent over entire surface. Basal leaves withering early. Proximal stem leaves opposite, distal ones in whorls of 4; petiole 0.5–2 cm, distal ones winged; leaf blade broadly elliptic-oblong, 2–3 cm × 5–8 mm, pinnatisect; segments broadly elliptic-oblong, pinnatifid, lobes 3–5 × ca. 1 mm. Inflorescences spicate, dense; bracts leaflike, 1.5–2.5 cm, longer than flowers, villous. Calyx 7–8 mm, deeply cleft anteriorly, densely pubescent; lobes 5, unequal, posterior one lanceolate and entire, lateral lobes broadly ovate and serrat. Corolla red; tube bent at a right angle forward apically, ca. as long as or slightly longer than calyx; galea erect, truncate at apex, beakless, glabrous; lower lip slightly longer than galea, glabrous. Filaments glabrous; anthers apiculate. Fl. Jun, fr. Jul–Aug.

- Alpine meadows; 3800–4100 m. NW Yunnan.


短唇马先蒿 duan chun ma xian hao

Herbs annual, 25–45 cm tall, not drying black. Stems single or 4 or 5 cespitose, erect or outer stems ascending, branched basally or unbranched, sparsely pubescent or with lines of white hairs. Proximal leaves opposite, distal ones in whorls of 4; petiole of proximal leaves slender, to 2.5–3 cm, distal leaves sessile or short petiolate; leaf blade long ovate to elliptic-oblong, 1.5–3 × 1.4–2 cm, pinnatifid; segments 4–8 pairs, ovate-oblong, incised-dentate. Inflorescences capitate or spicate, elongated to 8 cm, interrupted basally; proximal bracts leaflike, longer than flowers, distal ones ca. as long as to shorter than flowers. Calyx campanulate, slightly cleft anteriorly, white villous; tube 7–8 mm; lobes 5, unequal, triangular to ovate-oblong, entire to dentate. Corolla pale red, 1.5–2 cm; tube bent within calyx tube, 6–8 mm; galea ± falcate, 0.9–1.2 cm, apex with a short truncate beaklike tip; lower lip shorter than galea, 6–8 × 6–9 mm, finely ciliate. Filaments glabrous. Fl. Jul, fr. Aug.

- Alpine meadows, thickets; 2700–3500 m. SW Gansu, NW and S Sichuan.


小根马先蒿 xiao gen ma xian hao

Pedicularis leptorhiza F. Ruprecht.

Herbs annual, to 12 cm tall. Roots fusiform, slender. Stems single or 3–6 cespitose, erect, unbranched, with lines of hairs. Leaves opposite or in whorls of 3–5; petiole 3–8 mm; leaf blade lanceolate to oblong-lanceolate, 1.5–2.2 cm × 3–5 mm, pinnatisect; segments 6 or 7 pairs, widely spaced, pinnatifid or incised-dentate. Inflorescences spicate, 1.8–3 cm, dense initially, becoming lax; proximal bracts leaflike, distal ones ca. as long as calyx apically, narrowly ovate. Calyx turgid becoming lax; proximal bracts leaflike, longer than flowers, distal ones ca. as long as to shorter than flowers. Calyx campanulate, slightly cleft anteriorly, white villous; tube 7–8 mm; lobes 5, unequal, triangular to ovate-oblong, entire to dentate. Corolla red, 1.5–2 cm; tube bent within calyx tube, 6–8 mm; galea ± falcate, 0.9–1.2 cm, apex with a short truncate beaklike tip; lower lip shorter than galea, 6–8 × 6–9 mm, finely ciliate. Filaments glabrous. Fl. Jul, fr. Aug.
than 2 × as long as calyx; galea with a broadly conical and truncate beaklike tip; lower lip shorter than galea, spreading, wider than long, serrulate, lobes rounded, middle lobe smaller than lateral pair and projecting.


Subalpine regions. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


Herbs not drying black, pubescent. Stems branched basally or unbranched. Leaves opposite or in whorls of 3, petiolate, oblong, pinnatifid. Inflorescences spicate. Calyx lobes 5, unequal. Corolla tube ± erect; galea longer than lower lip, terminating in a very short obtuse beak, marginal teeth lacking.

One species: endemic to China.


Herbs annual, to 30 cm tall. Roots slender. Stems with 4 lines of hairs. Proximal leaves opposite, distal ones in whorls of 3; petiole to 1.5 cm; leaf blade oblong, 1.5–2.5 × ca. 1 cm; segments 5–7 pairs, ovate to obovate-ovate, dentate, both surfaces densely lanulose. Inflorescences interrupted basally, long pubescent; bracts leaflike basally, rhomboidal apically. Calyx short cylindric, densely villous along veins; posterior lobe triangular, entire, lateral lobes larger, ovate, serrate. Corolla rose; tube shorter than calyx tube and galea; galea slightly falcate; lower lip shorter than galea, ciliate, middle lobe rounded, smaller than lateral pair. Filaments glabrous. Fl. Aug, fr. Sep.

Alpine meadows, forests; 3500–4000 m. E and W Gansu, N Sichuan, E Xizang.


Herbs slightly drying black or not. Stems erect or ascending. Leaves whorled, pinnatisect. Stem leaves numerous. Inflorescences racemose or spicate. Calyx lobes 5. Corolla tube erect; galea bent apically, apex producing a beak. Nine species: North America (Alaska), China, Japan, Mongolia, Russia (Siberia); eight species in China.

1a. Beak of corolla less than 1 mm; corolla only 1.4 cm, rose; lateral calyx lobes ± entire ........... 180. P. myriophylla
1b. Beak of corolla 2–3(–5) mm; corolla 1.5–2.5 cm; lateral calyx lobes serrate, pinnatifid, or entire.

2a. Corolla tube erect; galea distinctly crested.
3a. Calyx lobes narrowly triangular-lanceolate; middle lobe of lower corolla lip not hoodlike apically .................................................................................................................................................. 186. P. cristatella
3b. Calyx lobes ± flabellate; middle lobe of lower corolla lip hoodlike apically .................. 187. P. deqinensis
2b. Corolla tube ± decurved; galea indistinctly crested.
4a. Corolla purplish red ........................................................................................................ 184. P. tatarinowii
4b. Corolla yellow.

5a. At least proximal bracts distinct, longer than flowers; all filaments glabrous or 2 pubescent.
6a. Corolla 2–2.5 cm; anterior filaments villous ........................................................................ 181. P. alaschanica
6b. Corolla ca. 1.5 cm; filaments glabrous or pubescent .............................................. 185. P. scolopax
5b. All bracts shorter than flowers; filaments pubescent.
7a. Basal leaves persistent; stems herbaceous, unbranched apically; calyx at least 1/2 cleft anteriorly, densely brown ciliate .................................................. 182. P. pseudocurvituba
7b. Basal leaves not persistent; stems ± woody, short branched throughout; calyx barely 1/3 cleft anteriorly, slightly ciliate .................................................. 183. P. curvituba


Herbs annual, to 40 cm tall, not drying black. Roots conical, slender. Stems usually single, branched throughout, with 4 lines of hairs. Basal leaves withering early. Stem leaves in whorls of (3 or)4, rarely opposite; petiole to 1 cm; leaf blade lanceolate-oblong, ca. 3 × 1 cm, both surfaces glabrous, pinnatisect; segments 10–13 pairs, linear-lanceolate, pinnatifid, few toothed. Inflorescences racemose, sometimes interrupted basally; proximal bracts leaflike. Pedicel elongating to 2.5 mm in fruit. Calyx to 7 mm, glabrous, ca. 1/3 cleft anteriorly; lobes 5, slightly unequal, triangular, ± entire, ciliate. Corolla rose or purple, ca. 1.4 cm; tube equal to or longer than calyx, erect basally, slightly bent and expanded apically; galea barely bent apically, much wider than tube; beak pointing outward, not prominent, less than 1 mm; lower lip ca. 5 × 5 mm. Anterior filament pair villous, posterior pair glabrescent. Capsule lanceolate-ovoid, ca. 1.5 cm, apex acuminate. Fl. Jun–Jul, fr. Jul–Aug.
1a. Corolla rose, tube ca. as long as or slightly exceeding calyx .................. 180a. var. myriophylla

1b. Corolla purple, tube slightly longer, exceeding calyx ......................... 180b. var. purpurea

180a. Pedicularis myriophylla var. myriophylla
万叶马先蒿(原变种) 万叶马先蒿


阿拉善马先蒿

181a. Pedicularis alaschanica subsp. alaschanica

1b. Leaves in whorls of 3 or 4, Calyx villous only along veins; lobes obscurely serrate to ± entire. Beak of galea long.

181a. Pedicularis alaschanica subsp. alaschanica


西藏阿拉善马先蒿


假弯管马先蒿

弯管马先蒿
Herbs annual, to 50 cm tall, woody at base, not drying black. Roots fleshy. Stems 1–6, erect or outer ones branched apically, with 4 dense yellow lines of hairs. Leaves opposite or in whorls of 5; petiole to 1 cm, densely yellow villous; leaf blade oblong-lanceolate to narrowly lanceolate, 2.5–3 cm long, abaxially villous along veins, adaxially short bristly, pinnatifid; segments 6–12 pairs, lanceolate, pinnatifid, serrate. Inflorescences long spicate, to 20 cm, with flowers in whorls of 3 or 4, often interrupted; proximal bracts leaflike. Calyx yellow, membranous, slightly cleft anteriorly; lobes 5, ± equal, narrowly triangular-lanceolate, entire. Corolla reddish purple; tube erect, 8–9 mm; galea bent apically, ca. 1 cm, distinctly crested; beak bent downward, ca. 6.5 mm; lower lip ca. 4 × 6.5 mm, glabrous. Filaments glabrous. Fl. Jun–Jul, fr. Aug.


鹬形马先蒿  yu xing ma xian hao

Herbs perennial, to more than 30 cm tall, not drying black. Roots fusiform, fleshy. Stems branched at base, central stem ± erect, outer stems procumbent to ascending, densely pubescent. Basal leaves few, withering early. Proximal stem leaves opposite or in whorls of 3, other ones in 4’s; petiole to 2 cm, villous; leaf blade oblong-lanceolate to narrowly lanceolate, 1.5–3 cm × 6–10 mm, glabrescent on both surfaces, pinnatifid; segments 6–8 pairs, widely spaced, linear, pinnatifid, serrulate. Inflorescences spicate, to 11 cm, flowers in whorls of 4–6, interrupted basally; proximal bracts longer than flowers, distal ones shorter than flowers, ciliate. Calyx 9–10 mm, membranous, slightly cleft anteriorly, pubescent along veins; lobes 5, unequal, serrate and ± entire. Corolla yellow, ca. 1.5 cm; tube slightly bent apically, ca. 1 cm, slender; galea slightly bent apically, indistinctly serrate; beak bent downward, ca. 3 mm; lower lip ca. 4 × 6.5 mm, glabrous. Filaments glabrous. Fl. Jun–Jul, fr. Aug.

• Alpine shrubby grasslands; 3500–4100 m. N Gansu, NE Qinghai.


具冠马先蒿  ju guan ma xian hao

*Pedicularis cristata* Maximowicz (1888), not Vitmann (1879).

Herbs annual, to 50 cm tall, woody basally, not drying black. Roots to 10 cm, woody. Stems 1 to several, erect or outer ones ± ascending or procumbent, often reddish purple, rigid, many branched apically, with 4 lines of hairs. Basal leaves withering early. Stems leaves in whorls of (3 or)4, rarely opposite, short petiolate; leaf blade ovate-oblong to oblong-lanceolate, 2.5–3.5 × 0.8–1.5 cm, pinnatifid; segments 5–10 pairs, lanceolate, pinnatifid to pinnatifide, dentate. Inflorescences racemose; bracts leaflike, shorter than flowers. Calyx ca. 8 mm, membranous, slightly cleft anteriorly; lobes 5, narrowly lanceolate, serrate. Corolla purplish red; tube slightly bent apically, slightly longer than calyx; galea strongly bent apically, indistinctly crested; beak bent downward, ca. 2 mm; lower lip longer than galea. Filaments pubescent or posterior pair glabrescent. Capsule obliquely ovoid, ca. 1.6 cm × 7.5 mm, slightly exceeding calyx. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine meadows; 2000–3000 m. N Hebei, S Nei Mongol, N Shanxi.


德钦马先蒿  de qin ma xian hao

Herbs annual, to 20 cm; bracts shorter than flowers, proximal ones leaflike. Pedicel short. Calyx ca. 1.1 cm, barely 1/3 cleft anteriorly; lobes 5, unequal, slightly ciliate, pinnatifid to serrate. Corolla yellow or white, ca. 2 cm; tube strongly bent in calyx, expanded apically; galea slightly bent apically, indistinctly crested; beak slightly bent downward, 2.5–3 mm; lower lip ca. 8 mm × 1.3 cm. Filaments pubescent. Fl. Jun–Jul, fr. Jul–Aug.

• Open slopes; ca. 1600 m. N, SE, and SW Gansu, N Hebei, E Nei Mongol, N Shaanxi.

1a. Corolla yellow, usually small; stems ± woody at base; leaf segments ovate - lanceolate to linear-lanceolate 183a. subsp. *curvituba* 1b. Corolla white, large; stems much woody; leaf segments linear 183b. subsp. *provitii*
Herbs annual, 20–35 cm tall, drying slightly black. Stems 1 to several, erect or outer stems ascending, with 4 lines of hairs, often branched apically, branches 2–4 per node, dark purple. Stem leaves opposite in whorls of 4; petiole 5–10 mm; leaf blade oblong to elliptic-oblong, 2.5–5 × 0.8–2.5 cm, abaxially sparsely pubescent, adaxially glabrescent, pinnatisect; segments 5–12 pairs, oblong-lanceolate, pinnatifid, dentate. Inflorescences racemose, to 18 cm, with whorled flowers, interrupted; bracts leaflike. Calyx cylindric-campanulate, ca. 5 mm, slightly cleft anteriorly, glabrous; lobes 5, ± flabellate, 3–or 4-cleft, often reflexed, densely villous-ciliate. Corolla pale purple, with purple galea, 1.5–1.8 cm; tube erect; galea bent at a right angle apically, conspicuously crested; beak ca. 5 mm; lower lip ca. 8 mm × 1.2 cm, middle lobe hoodlike apically. Filaments glabrous. Capsule ovoid, ca. 1 cm, apex short acuminate. Fl. Jul–Aug, fr. Aug–Sep.

**Quercus semecarpifolia** forests, river valleys; 2900–3400 m. NW Yunnan.


半扭卷系 ban niu juan xi

Ser. Gyrorhynchae Prain.

Herbs slightly drying black or not. Stems usually branched. Leaves opposite or in whorls of 3 or 4, pinnatifid to pinnatisect. Inflorescences long spicate, interrupted basally; bracts usually narrow and serrate or pinnatifid. Calyx lobes 5, unequal or sometimes ± equal, ± serrate. Corolla tube erect; galea bent apically; beak long, coiled or twisted apically.

- Six species: endemic to China.

1a. Corolla purple-red; plants perennial.

2a. Calyx densely white villous, 1/2 cleft anteriorly; galea crested; filaments glabrous ............... 192. *P. fetisowii*

2b. Calyx glabrous, slightly cleft anteriorly; galea not crested; filaments densely villous .......... 193. *P. oliveriana*

1b. Corolla yellow; plants annual.

3a. Bracts usually ± palmately cleft apically; lower corolla lip not ciliate, middle lobe not hoodlike; calyx more than 1/2 cleft anteriorly.

4a. Beak of galea very long, twisted laterally into a circle; filaments 2 villous ..................... 191. *P. semitorta*

4b. Beak of galea slightly bent or coiled at apex, not twisted laterally; filaments glabrous 188. *P. roborowskii*

3b. Bracts not palmately cleft apically; lower corolla lip ciliate, middle lobe hoodlike; calyx slightly cleft anteriorly.

5a. Lateral calyx lobes ovate, distinctly serrate ................................................................. 189. *P. gyrorhyncha*

5b. Lateral calyx lobes lanceolate-linear, obscurely serrate .................................................. 190. *P. duclouxii*


劳氏马先蒿 lao shi ma xian hao

Herbs annual, to 50 cm tall, drying slightly black. Stems several, ± woody at base, with 4 lines of hairs. Basal leaves opposite; petiole to 2 cm. Stem leaves in whorls of 4; petiole to 3–5 mm; leaf blade broadly oblanceolate to ovate-oblong, to 4 × 2 cm, pinnatisect; segments 5–7 pairs, lanceolate to linear, pinnatifid, dentate. Inflorescences usually long racemose, to 18 cm, interrupted; proximal bracts leaflike, longer than flowers, distal ones slightly enlarged at base, ± palmately 3–5-cleft, glabrescent. Pedicel short. Calyx 8–10 mm, more than 1/2 cleft anteriorly; segments 5–7, lanceolate to linear, pinnatifid, dentate. Inflorescences usually long racemose, to 18 cm, interrupted; proximal bracts leaflike, longer than flowers, distal ones slightly enlarged at base, ± palmately 3–5-cleft, glabrescent. Pedicel short. Calyx 8–10 mm, more than 1/2 cleft anteriorly; lobes 5, ± equal, grouped posteriorly, slender. Corolla yellow, barely 1.3 cm; tube decurved through anterior calyx cleft; galea with deltoid marginal teeth; beak slightly bent or coiled at apex, ca. 5 mm; lower lip ca. 8 × 9 mm, glabrous, middle lobe subrounded. Filaments glabrous. Capsule triangular-ovoid, ca. 1.8 cm.

- *Picea* and *Betula* forests. W Gansu, E Qinghai, N Sichuan.


旋喙马先蒿 xuan hui ma xian hao

Herbs annual, 23–110 cm tall, not drying black. Stems often many branched apically; branches slender, 1–4 per node. Basal leaves opposite. Stem leaves in whorls of 3 or 4; petiole to 3 cm basally; leaf blade ovate-oblong to lanceolate-oblong, 2–6 × 0.8–2.5 cm, abaxially sparsely long pubescent to glabrescent, adaxially sparsely pubescent, pinnatifid to pinnatisect; segments 4–10 pairs, ovate to linear-oblong, incised-dentate. Inflorescences spicate, interrupted; proximal bracts leaflike, often longer than flowers. Calyx ca. 8 mm, scarcely cleft anteriorly, sparsely pubescent along veins; lobes 5, unequal, posterior one triangular, entire, lateral teeth larger, ovate, serrate. Corolla pale yellow, 0.9–1.7 cm; tube ca. 8 mm; beak semicircular, 8–9 mm; lower lip ca. 7 mm × 1.3 cm, ciliate, middle lobe subrounded, hoodlike. Filaments pubescent. Capsule enclosed by accrescent calyx, to 2 cm. Fl. Jul–Aug, fr. Aug–Sep.

• Moist ground, forest clearings; 2700–4000 m. NW Yunnan.

Herbs annual, 30–50(–70) cm tall, slightly woody basally, not drying black. Roots conical, slender. Stems single, branched or not, with 4 lines of hairs. Basal leaves withering early. Stem leaves opposite or in whorls of 3 or 4; petiole to 2 cm; leaf blade oblanceolate, 1.3–8 × 0.5–3 cm, abaxially pubescent along veins, adaxially sparsely pubescent or glabrescent, pinnatifid to pinnatisect; segments 5–11 pairs, widely spaced, oblanceolate, often not symmetrical, margin double dentate or pinnatifid. Inflorescences spicate, interrupted; proximal bracts leaflike, distal ones ovate. Pedicel short. Calyx scarcely cleft anteriorly, membranous; lobes 5, unequal, posterior one triangular, entire, lateral teeth larger, lanceolate-linear, obscurely serrate, ciliate. Corolla yellow, 1.2–1.4 cm; tube 6–7 mm; lateral teeth larger, lanceolate-linear, obscurely serrate. Corolla dark reddish purple; tube 0.8–1.2 cm, slightly expanded near apex, finely pubescent; galea crested, marginally long ciliate; beak S-shaped, ca. 8 mm; lower lip 6–8 mm, obliquely apiculate. Fl. Jun–Aug, fr. Sep–Oct.


半扭卷马先蒿  ban niu juan ma xian hao

Herbs annual, to 60 cm tall, ± drying black. Roots conical, slender. Stems 1–5, unbranched or branched apically; branches slender, often 3–5 per node. Basal leaves withering early; petiole to 3 cm. Stem leaves in whorls of 3–5; petiole 1–3 cm, distal ones much shorter; leaf blade ovate-oblong to linear-oblong, 3.5(–10) cm × 1.5(–50) mm, abaxially glabrescent, adaxially sparsely pubescent or glabrescent, pinnatisect; segments 5–10 pairs, linear, pinnatifid, dentate. Inflorescences spicate, more than 20 cm, interrupted basally; bracts shorter than flowers, proximal ones leaflike, distal ones usually ± palmately cleft. Calyx 9–10 mm; more than 1/2 cleft anteriorly, glabrous; lobes 5, grouped posteriorly, linear. Corolla yellow, 1.4–1.8 cm; tube slightly enlarged and curved apically, 1–1.1 cm; beak twisted laterally usually into a circle, 5–7 mm; lower lip ca. 1.1 × 1.4–1.7 cm, glabrous. Filaments 2 villous, 2 glabrous. Capsule 3/4 enclosed by accrescent calyx, compressed, ovoid, ca. 1.7 cm × 6 mm, obliquely apiculate. Fl. Jun–Jul, fr. Jul–Aug.


费氏马先蒿  fei shi ma xian hao

Herbs perennial, 14–40 cm tall, not drying black. Roots densely fascicled, ± fleshy. Stems dark purplish, pubescent to glabrescent. Basal leaves withering early. Proximal stem leaves opposite, distal ones in whorls of 4; petiole of proximal leaves ca. 3.5 cm, distal ones to 2–3 mm; leaf blade oblanceolate to linear-lanceolate, with narrowly winged and dentate midvein, 0.8–4.5 × 0.2–2.8 cm, abaxially sparsely white pubescent or glabrescent, adaxially glabrous, pinnatifid; segments 11 pairs, pinnatifid, few toothed. Inflorescences capitate to short spicate, to 12 cm, interrupted; bracts linear-lanceolate, shorter than flowers. Calyx 6–7 mm, membranous, densely white villous, ca. 1/2 cleft anteriorly; lobes 5, unequal, posterior one triangular, entire, lateral teeth larger, obscurely serrate. Corolla purple-red; tube 0.8–1.2 cm, slightly expanded near apex, finely pubescent; galea crested, marginally long ciliate; beak S-shaped, ca. 8 mm; lower lip 7–9.5 × 7–12 mm, lobes ± equal. Filaments glabrous. Fl. Jun, fr. Jul–Aug.


篦齿系  bi chi xi
Herbs often drying black. Stems erect, often branched apically. Leaves in whorls of 4 or 5, ovate-lanceolate, 2-pinnatifid. Inflorescences long spicate; bracts ovate and entire, at least distal ones. Calyx large, ca. 1 cm, 1/3 cleft anteriorly; lobes 5, entire. Corolla tube erect, shorter than calyx; beak semicircular or S-shaped, slender.

About six species: China, Himalayas; one species in China.


喙毛马先蒿 hui mao ma xian hao

Herbs perennial to 60 cm tall, ± drying black. Roots ± fusiform, fleshy. Stems 1 to several, unbranched, glabrous basally, with 4 or 5 lines of hairs apically. Basal leaves withering early. Stem leaves in whorls of 4 or 5; ± sessile to short petiolate, glabrous; leaf blade lanceolate-oblong, to 7 × 3 cm, pinnatifid; segments 6–10 pairs, linear, adaxially pubescent along midvein, incised-dentate. Inflorescences centripetal, elongated, with 8–12 fascicles, interrupted; bracts linear, longer than flowers. Calyx cylindric, ca. 9 × 2.5 mm; lobes 5, unequal, posterior one smaller and narrower than lateral lobes, lateral lobes lanceolate, slightly serrate, densely ciliate. Corolla purple-red; tube ca. 9 mm, glabrous; galea bent apically, margin ciliate; beak S-shaped, to 1 cm, densely brown lanulose at middle; lower lip ciliate. Filaments glabrescent. Capsule 2/3 enclosed by accrescent calyx, long ovoid, ca. 1.2 cm. Fl. and fr. Jun–Aug.

Moist ground; *Picea* woodlands, margins of burned forests, forest clearings; 2700–3700 m. SE Xizang.


苏台德系 su tai de xi


Herbs erect. Roots fascicled, fibrous. Stems unbranched. Leaves alternate. Basal leaves often persistent, pinnatifid to 1- or 2-pinnatisect or pinnatifid; segments lanceolate, only dentate. Inflorescences spicate, dense, elongated. Calyx lobes 5, equal. Corolla tube longer than calyx; galea marginally 2-toothed, sometimes slightly short beaked.

About eight species: North America, Asia, Europe; two species in China.

1a. Plants 30–60 cm tall; leaves mostly on stem, leaf blade to more than 12 cm; inflorescences long spicate, to 20 cm; calyx to 5–6 mm, teeth triangular; corolla pale rose, galea much longer than lower lip; filaments pubescent ................................................................. 195. *P. elata*

1b. Plants 10–25 cm tall; leaves mostly basal, leaf blade to 5 cm; inflorescences short spicate, to 6 cm; calyx to 14 mm, teeth linear-lanceolate; corolla pale yellow, galea slightly longer than lower lip; filaments glabrous ........................................................................................................ 196. *P. songarica*


高升马先蒿 gao sheng ma xian hao

Herbs perennial, 30–60 cm tall, herbage subglabrous, not drying black. Stems erect, unbranched, with brown, lanceolate to linear-lanceolate scales at base. Basal leaves withering early; petiole to 5 cm. Stem leaves alternate; petiole 2.5 cm to barely sessile; leaf blade ovate-oblong, to 12 × 5.5 cm, pinnatifid; segments 10–18 pairs, narrowly lanceolate, pinnatifid to dentate. Inflorescences long spicate, to 20 cm, bracts and calyces woolly; bracts 3–5-palmatisect. Calyx 5–6 mm, membranous, slightly cleft anteriorly; teeth triangular, entire. Corolla pale rose, 2.1–2.5 cm; tube ca. 1 cm; galea falcate, ca. 2 × as long as lower lip, apex very short beaked; lower lip sparsely ciliate and erose, middle lobe emarginate apically. Filaments pubescent. Fl. Jun, fr. Jul.

Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


准噶尔马先蒿 zhuang er ma xian hao

Herbs perennial, 10–25 cm tall, subglabrous, drying black. Roots fascicled, ± fusiform, fleshy. Stems often single. Leaves mostly basal; petiole to 4 cm; leaf blade ± lanceolate, to 5 × 1.3 cm, glabrous on both surfaces, pinnatisect; segments 15–30 pairs, ovate-lanceolate to linear-lanceolate, pinnatifid or double dentate. Stem leaves few, similar to basal leaves but smaller and shorter petiolate. Inflorescences short spicate, to 6 cm, often dense; bracts longer than flowers basally, narrowly lanceolate to linear-lanceolate. Calyx tubular, to 1.4 cm; lobes 5, unequal, linear-lanceolate, ciliate, serrulate. Corolla pale yellow; tube ca. 1.6 cm, glabrous; galea slightly falcate, ca. 9 mm, apex short beaked; lower lip shorter than galea. Filaments glabrous. Capsule lanceolate-oblong, 1.5–1.6 cm. Fl. Jun–Jul, fr. Jul–Aug.

Xinjiang [Kazakhstan].

T. N. Popova and L. I. Ivanina (pers. comm.) suggest that the occurrence of this species in China is questionable, and that the plants described here may belong to *Pedicularis pubiflora* Vvedensky.


Herbs comose, usually more than 15 cm tall. Roots fascicled, fibrous. Leaves basal and on stem, alternate, oblong-lanceolate, usually 2-pinnatifid or pinnatipartite. Inflorescences densely spicate and elongated, racemose, or subcapiate. Calyx slightly cleft anteriorly, 5-lobed. Corolla tube erect; galea 2-toothed, beakless or short beaked; lower lip spreading.

About 30 species: Asia, Europe; 11 species in China.

1a. Corolla ca. 1.4 cm ................................ ................................ .......................... 197. *P. breviflora*
1b. Corolla ca. 1.8 cm or more, if less, then yellow.

2a. Flowers purple, rose, or white.
   3a. Leaves 2- or 3-pinnatifid; calyx with 2 pairs of lateral lobes connivent; corolla ca. 2.7 cm 202. *P. rubens*
   3b. Leaves 1-pinnatisect or pinnatipartite; calyx lobes not connivent; corolla 2–2.5 cm.
      4a. Calyx 5–6 mm, lobes lanceolate, entire; capsule ovoid, 8–10 mm .......................... 198. *P. dasystachys*
      4b. Calyx 10–14 mm, lobes triangular-lanceolate, dentate; capsule oblong-lanceolate, 10–20 mm ........ 200. *P. uliginosa*

2b. Flowers yellow.
   5a. Calyx lobes narrowly triangular to lanceolate, longer than wide.
      6a. Lower corolla lip ca. as long as galea; inflorescences 4–15 cm; calyx to 1.4 cm ......... 201. *P. flava*
      6b. Lower corolla lip shorter than galea; inflorescences to 25 cm; calyx ca. 1 cm ...... 203. *P. achilleifolia*
   5b. Calyx lobes ± triangular (except *P. mariae*), wider than long (except *P. dolichorrhiza*).
      7a. Calyx lobes not connivent.
      8a. Corolla 2.6–3.5 cm; calyx 1.6–2 cm; filaments glabrous ........................................ 199. *P. physocalyx*
      8b. Corolla 2–2.5 cm; calyx 8–10 mm; filaments 2 pubescent, 2 glabrous ..................... 204. *P. venusta*
      7b. Calyx lobes connivent in 2 lateral pairs.
         9a. Beak of galea distinct, longer than wide ..................................................... 207. *P. dolichorrhiza*
         9b. Beak of galea very short or ± absent, wider than long.
            10a. Capsule oblong, ca. 1 cm ................................................................. 205. *P. altaica*
            10b. Capsule obliquely oblong, 1.3–1.5 cm ................................................... 206. *P. mariae*


and on stem; petiole ca. 1/2 as long as leaf blade, brown pubescent; leaf blade lanceolate, pinnatifid. INFLORESCENCES simple, dense, elongating in fruit, pubescent. Corolla yellow, 1.4–1.8 cm; tube erect; galea falcate, ca. as long as tube; beak short, apex truncate; lower lip ca. as long as galea. Filaments pubescent. Capsule long ovoid, compressed, ca. 1.5 cm × 7 mm, long apiculate. Fl. Jun–Jul, fr. Jul–Aug.

Rocky grassy slopes, slightly alkaline meadows; ca. 1500 m. N Nei Mongol [Mongolia, Russia (E Siberia)].


**红色马先蒿**  hong se ma xian hao
Herbs perennial, 10–35 cm tall, drying black or not. Roots clustered, linear, to 8 cm. Stems single, sulcate, with lines of whitish hairs, with ± persistent remnant scales at base. Leaves mostly basal; petiole to 7 cm, whitish pubescent; leaf blade narrowly oblong to oblong-lanceolate, to more than 10 × 3 cm, 2- or 3-pinnatisect; segments linear, incised-dentate, teeth callose. Inflorescences racemose, more than 10 cm; bracts leaflike, densely whitish villous. Calyx to 1.3 cm, densely whitish villous, with dense reticulate venation; lobes 5, unequal, 2 pairs of lateral lobes connivent, entire, apex 2-cleft. Corolla rose, ca. 2.7 cm; tube ca. 1.4 cm, glabrous; galea ± falcate apically, ca. as long as tube; beak short, apex obliquely truncate, marginally 2 subulate-toothed and with several small teeth; lower lip slightly shorter than galea. Filaments sparsely pubescent. Fl. Jun–Jul, fr. Jul–Aug. 2n = 16.

Steppes, thinly wooded slopes. N Hebei, Heilongjiang, Jilin, Liaoning, NE Nei Mongol [Mongolia, Russia (E Siberia)].


**秀丽马先蒿**  xiu li ma xian hao
Herbs perennial, 10–40 cm tall, drying ± black. Roots numerous, fascicled. Stems often single, stricate, often with persistent scales and old petioles at base. Whitish woolly. Leaves mostly basal, clustered; petiole to 7 cm, whitish pubescent; leaf blade narrowly oblong to oblong-lanceolate, to more than 10 × 3 cm, 2-pinnatisect; segments linear, incised-dentate, teeth callose. Inflorescences racemose, more than 10 cm; bracts leaflike, densely whitish villous. Calyx to 1.3 cm, densely whitish villous, with dense reticulate venation; lobes 5, unequal, 2 pairs of lateral lobes connivent, entire, apex 2-cleft. Corolla rose, ca. 2.7 cm; tube ca. 1.4 cm, glabrous; galea ± falcate apically, ca. as long as tube; beak short, apex obliquely truncate, marginally 2 subulate-toothed and with several small teeth; lower lip slightly shorter than galea. Filaments sparsely pubescent. Fl. Jun–Jul, fr. Jul–Aug. 2n = 16.

Steppes, thinly wooded slopes. N Hebei, Heilongjiang, Jilin, Liaoning, NE Nei Mongol [Mongolia, Russia (E Siberia)].
Herbs perennial, 10–40 cm tall. Stems usually single, erect, unbranched, often slender, long woolly. Basal leaf petiole ca. 1/2 to as long as leaf blade, pubescent; leaf blade lanceolate, pinnatisect; segments oblong, pinnatifid, dentate, teeth callose. Stem leaves similar to basal ones but smaller, distal ones shorter petiolate. Inflorescences oblong, dense or elongated spikes, often scabrously long woolly; proximal bracts ca. as long as calyx, leaflike, middle ones pinnately 3–5-lobed. Pedicel ± absent. Calyx campanulate, 8–10 mm, ± leathery; lobes 5, broadly triangular, wider than long. Corolla yellow, 2–2.5 cm; tube erect, falcate apically, shorter than galea; galea short, beakless; lower lip slightly shorter than galea, not ciliate. Filaments 2 pubescent, 2 glabrous. Capsule compressed, obliquely oblong, 1–1.2 cm, apiculate. Fl. Jun–Jul, fr. Jul–Aug.

2n = 16.

Meadows, frequently in alkaline places. Heilongjiang, Nei Mongol, Xinjiang [Mongolia, Russia (Siberia, Far East)].


阿尔泰马先蒿 a er tai ma xian hao

Herbs perennial, 20–40 cm tall. Stems usually single, often ascending, slender, sparsely long woolly, often shiny. Basal leaves few; petiole ca. 1/2 as long as leaf blade, glabrous; leaf blade linear-lanceolate, pinnatisect; segments oblong-lanceolate or lanceolate, dentate, teeth callose. Stem leaves smaller than basal leaves, shorter petiolate to sessile; leaf blade pinnatifid at base; lobes pectinate anteriorly. Inflorescences long, with laxly arranged flowers; bracts 3-lobed, proximal ones sometimes longer than calyx, middle ones shorter. Pedicel short. Calyx narrowly campanulate, 1–1.2 cm, ± leathery, tinged purple punctate, glabrous or sometimes gray pubescent; lobes 5, triangular, very short, wider than long, 2 pairs of lateral lobes connivent. Corolla yellow, 2.5–2.7 cm; tube erect; galea falcate apically, ca. as long as tube; beak very short or ± absent; lower lip ca. as long as galea, long stipitate basally, ± ciliate. Filaments 2 pubescent, 2 glabrous. Capsule oblong, ca. 1 cm, mucronulate. Fl. Jun–Jul, fr. Jul–Aug.


玛丽马先蒿 ma li ma xian hao

Herbs perennial, ca. 20 cm tall. Stems erect, unbranched, sparsely pubescent. Leaves alternate, glabrous; basal and proximal stem leaves petiolate; leaf blade oblong, pinnatisect; segments ovate or oblong, pinnatifid or pectinate-dentate. Inflorescences racemose, dense initially, becoming lax; bracts ovate basally, 3–5-lobed, long pubescent, serrate or entire, distal ones ovate-cuneate to oblong-cuneate; lobes 3, entire. Calyx tube 5-angular; lobes 5, unequal, lanceolate, less than 1/2 as long as tube, 2 pairs of lateral lobes connivent; entire or serrate. Corolla yellow, ca. 2 × as long as calyx; galea ± erect; beakless, apex rounded; lower lip ca. as long as galea, ciliate. Filaments glabrous. Capsule obliquely oblong, 1.3–1.5 cm. Fl. May–Aug, fr. Jun–Sep.

Xinjiang [Kazakhstan].


长根马先蒿 chang gen ma xian hao

Herbs perennial, 20–100 cm tall, sparingly pubescent, not drying black. Roots ± fleshy, fusiform. Stems to several, erect, unbranched, hollow, with lines of whitish hairs. Basal leaves clustered, withering in fruit, 10–45 cm; petiole to 27 cm; leaf blade narrowly lanceolate, to 25 × 6 cm, pinnatisect; segments to 25 pairs, lanceolate, pinnatifid, dentate, teeth callose. Stem leaves smaller than basal leaves, distal ones shorter petiolate. Inflorescences long spicate, more than 20 cm; proximal bracts leaflike, distal ones 3-lobed. Calyx campanulate, to 1.3 cm, sparsely long pubescent, slightly cleft anteriorly; lobes 5, triangular, wider than long, 2 pairs of lateral lobes connivent, ± triangular, ciliate. Corolla yellow; tube 1.3–1.6 cm; galea falcate apically, to 1.4 cm; beak distinct, ca. 3 mm, longer than wide, apex 2-cleft, lobes toothlike; lower lip ca. as long as galea, erose-dentate. Filaments pubescent. Capsule 1–1.5 cm. Seeds long ovoid. Fl. Jun–Jul, fr. Jul–Aug.

About 2000 m. NW Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan].


球状系 qiu zhuang xi

Stems usually branched basally and at middle; branches alternate or sometimes pseudo-opposite. Leaves alternate or proximal ones often ± opposite, ± elliptic, pinnatifid. Inflorescences capitate or racemose, short. Calyx deeply cleft anteriorly, 3–5-lobed. Corolla tube longer than calyx, some 2 × longer, galea often crested, twisted laterally; beak slender.

Five species: China, N Myanmar; all five in China.

1a. Middle lobe of lower corolla lip elliptic to oblong, to 7 mm; galea prominently crested 212. P. pseudocephalantha
1b. Middle lobe of lower corolla lip obovate or obovate-rounded, not more than 5 mm; galea inconspicuously crested or not crested.

2a. Corolla 1.7–1.8 cm; calyx 5–6.5 mm.
   3a. Lower corolla lip not ciliate; all filaments villous apically; calyx 1/2 cleft anteriorly  208. *P. gracilicaulis*
   3b. Lower corolla lip ciliate; filaments 2 glabrous, 2 pubescent; calyx 2/3 cleft anteriorly  210. *P. strobilacea*

2b. Corolla 2–2.2 cm; calyx 9–12 mm.
   4a. Leaf blade 1.5–3 cm, segments 6–9 pairs; calyx 1/2 cleft anteriorly; lower corolla lip shorter than galea, middle lobe not emarginate  ................................ ............................................ 209. *P. dichrocephala*
   4b. Leaf blade 3–8 cm, segments 10–18 pairs; calyx 1/3 cleft anteriorly; lower corolla lip ca. as long as middle lobe emarginate  ................................ ................................................. 211. *P. lanpingensis*

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细瘦马先蒿  xi shou ma xian hao
Herbs annual, 20–40 cm tall. Stems several, often ascending, usually branched basally and at middle, sparsely pubescent or glabrescent. Leaves alternate; petiole to 3.5 cm, slender; leaf blade oblong, ca. 3 × 1 cm, villous on both surfaces, pinnatifid or dentate. Inflorescences subcapitate, dense with few flowers; bracts leaflike. Calyx oblong-ovate, 5–6.5 mm, pubescent, 1/2 cleft anteriorly; lobes 5, unequal, flabellate, 3-cleft. Corolla purple, 1.7–1.8 cm; tube ca. 1.5 cm; galea falcate near middle, inconspicuously crested; beak ca. 5 mm, slightly 2-cleft at apex; lobes of lower lip not ciliate, middle lobe slightly smaller than lateral pair and slightly projecting, obovate, emarginate. Filaments villous apically. Capsule compressed, ovoid, ca. 1.2 cm, apiculate. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows; 3000–3300 m. NW Yunnan.


重头马先蒿  chong tou ma xian hao
Herbs annual, 20–60 cm tall. Stems unbranched at base, with 2–4 lines of whitish hairs. Leaves alternate; petiole 0.5–3 cm, sparsely whitish villous; leaf blade ± lanceolate-oblung, 1.5–3 cm; whitish pubescent and scurfy on both surfaces, pinnatifid; segments 6–9 pairs, oblong, margin double dentate. Inflorescences racemose, densely capitate; bracts leaflike, proximal ones petiolate and shorter than flowers, distal ones ± sessile, whitish scurfy and sparsely pubescent. Pedicel barely 1 mm. Calyx 9–10 mm, sparsely whitish pubescent, 1/2 cleft anteriorly; lobes 5, unequal, ± leaflike, barely 1 mm. Corolla purplish red, 2–2.2 cm; tube erect, bent at a right angle apically, ca. 1.5 cm, sparsely villous and yellow glandular punctate, villous abaxially; beak falcate, ca. 3 mm, bent downward; lower lip yellowish white, shorter than galea, ca. 8 mm, sparsely ciliate, middle lobe obovate, not emarginate. Filaments villous. Fl. Aug, fr. Sep.

- Alpine meadows; 3300–3500 m. NW Yunnan [Myanmar].


球状马先蒿  qiu zhuang ma xian hao
Herbs annual, to 33 cm tall. Stems erect, often branching basally, sometimes branched at middle and apically; branches alternate or sometimes pseudo-opposite, whitish pubescent. Basal leaves withering early. Stem leaves alternate, widely spaced; petiole to more than 3 cm basally; leaf blade oblong to ovate-oblong, usually longer than petiole, to 4 × 2.2 cm, sparsely whitish pubescent and scurfy on both surfaces, pinnatifid to pinnatisect; segments 5–9 pairs, oblong or triangular-ovate to obliquely triangular-ovate, triangular-dentate. Inflorescences subcapitate-racemose; proximal bracts leaflike. Pedicel 3–4 mm, pubescent. Calyx obliquely funnel-form-campanulate, whitish villous, ca. 2/3 cleft anteriorly; tube 5–6 mm; lobes 5, leaflike, whitish pubescent internally. Corolla whitish yellow, with purple galea, ca. 1.8 cm; tube erect, longer than calyx; galea falcate, whitish villous, inconspicuously crested; beak filiform, ca. 5 mm, bent downward; lower lip ca. 8 mm × 1.2 cm, ciliate, middle lobe obovate. Filaments 2 pubescent, 2 glabrous. Capsule obliquely ovoid, apiculate. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows; 3300 m. NW Yunnan [Myanmar].


兰坪马先蒿  lan ping ma xian hao
Herbs perennial, ca. 20 cm tall, drying ± black. Roots several, fusiform, fleshy. Stems single, erect, unbranched, with 2–6 lines of hairs. Leaves mostly basal; petiole 4–10 cm; leaf blade oblong to lanceolate-oblong, 3–8 cm, abaxially sparsely pubescent and whitish scurfy, adaxially glabrescent, pinnatifid to pinnatisect; segments 10–18 pairs, oblong, margin double dentate. Stem leaves few, 2–4, alternate. Inflorescences capitate, many flowered; proximal bracts


Calystegia sepium (L.) R.Br. var. hirsutum (DC.) Kuntze

Alpine meadows, Picea forests; 2800–3600 m. NW Yunnan.


Herbs perennial, 40–50 cm tall. Stems several, erect or ascending, slender, glabrous or sparsely pubescent. Leaves mostly basal, alternate or proximal ones often pseudo-opposite. Petiole of basal leaves 5–9 cm, sparsely villous; leaf blade oblong-lanceolate to ovate-oblong, 3–7 × 1–1.8 cm, glabrous on both surfaces, sparsely whitish scurfy, pinnatisect; segments 5–7 pairs, ± oblong, pinnatifid, spinescent-dentate. Stem leaves few, smaller than basal leaves, shorter petiolate. Inflorescences subcapitate, 3–5-flowered; bracts leaflike. Pedicel rarely 1 mm. Calyx to 7 mm, 1/2 cleft anteriorly; lobes 2 or 3, unequal, posterior one, when present, smallest. Corolla purplish red, 1.7–2.1 cm; tube erect, longer than calyx, glabrous; galea falcate, conspicuously crested, with 1 reflexed marginal tooth on one side; beak ca. 5 mm, slightly cleft at apex, ± horizontal; lower lip slightly longer than galea, sparsely pubescent. Filaments 2 pubescent, 2 glabrous.

• NW Yunnan.


Herbs perennial, 20–25 cm tall, drying black. Stems several, branched near base; branches erect or ascending, slender, glabrous or sparsely pubescent. Leaves mostly basal, alternate or proximal ones often pseudo-opposite. Petiole of basal leaves 5–9 cm, sparsely villous; leaf blade oblong-lanceolate to ovate-oblong, 3–7 × 1–1.8 cm, glabrous on both surfaces, sparsely whitish scurfy, pinnatisect; segments 5–7 pairs, ± oblong, pinnatifid, spinescent-dentate. Stem leaves few, smaller than basal leaves, shorter petiolate. Inflorescences subcapitate, 3–5-flowered; bracts leaflike. Calyx ca. 8 mm; 1/2 cleft anteriorly; tube ca. 6
mm; lobes 3, unequal, posterior lobe smallest, lateral pair flabellate. Corolla yellow; tube erect, ca. as long as calyx; galea ± bent at a right angle apically, not crested, with 1 triangular reflexed marginal tooth on one side; lower lip ca. 6 × 7 mm, ciliate. Filaments glabrous. Fl. Jul, fr. Aug.

- NW Yunnan.


大山马先蒿 da shan ma xian hao

Herbs perennial, 20–32 cm, drying black. Roots ± fusiform, fleshy. Stems often single, erect, unbranched, pubescent apically. Leaves many, mostly basal; petiole to 3–7 cm; leaf blade linear-lanceolate, 5–9 × 1–1.3 cm, pinnatisect to pinnatipartite; segments 15–24 pairs, ± ovate, incised-double dentate. Stem leaves few, often 3–5, smaller than basal leaves. Inflorescences subcapitate; bracts leafflike. Pedicel 2–3 mm. Calyx ca. 6 mm, slightly cleft anteriorly; lobes 3, unequal, posterior one smallest. Corolla rose, ca. 2 cm; tube erect, 1.2–1.4 cm, villous; galea ± bent at a right angle, prominently crested, with 1 linear reflexed marginal tooth on one or both sides; beak to 6 mm; lower lip ca. 9 × 10 mm. Filaments pubescent. Capsule obovlong, 1–1.5 cm. Seeds ovoid, ca. 2 mm. Fl. Aug, fr. Aug–Sep.

- Swampy places; ca. 2200 m. E Yunnan.


尖果系 jian guo xi

Stems erect, branched near base or unbranched, rarely branched apically. Leaves basal and on stem, alternate or pseudo-opposite, oblong to lanceolate, often pinnatisect. Inflorescences racemose or spicate, usually elongated. Calyx lobes 3–5. Corolla tube longer than but less than 2 × as long as calyx; galea twisted or not; beak sometimes twisted, long, bent downward.

- Nine species: endemic to China.

1a. Beak of corolla straight or slightly bent, ± horizontal; galea not twisted.

2a. Leaf segments 5–7 pairs; corolla 1.1–1.3 cm; filaments glabrous .................................... 220. *P. macilenta*

2b. Leaf segments 7 or 8 pairs; corolla 1.4–2.2 cm; filaments pubescent.

3a. Leaves pinnatisect; stems simple or branched basally; calyx 4–5 mm, lobes equal, entire, glabrescent; corolla white, with purple beak, 1.4–1.8 cm .............................................. 221. *P. oxycarpa*

3b. Leaves pinnatifid to pinnatipartite; stems single, unbranched; calyx 6–8 mm, lobes unequal, lateral lobes dentate, sparsely pubescent; corolla white to purple-red throughout, 1.8–2.2 cm 222. *P. monbeigiana*

1b. Beak of corolla semicircular or S-shaped; galea twisted.

4a. Plants 5–8 cm tall; filaments glabrous.

5a. Stems single, densely glandular pubescent; calyx short, tube barely 4 mm, 3-lobed .. 226. *P. subulatidens*

5b. Stems usually several, not glandular pubescent; calyx long, tube to 8 mm, 5-lobed ...... 227. *P. longicalyx*

4b. Plants 15–40(–70) cm tall; filaments pubescent.

6a. Leaf segments 5–7 pairs; inflorescences elongated to only 5 cm; stems single ............ 223. *P. stewardii*

6b. Leaf segments 9–16 pairs; inflorescences elongated to 10–18 cm; stems usually several.

7a. Corolla ca. 1 cm, beak of galea semicircular; flowers reddish, with white spots on lower lip 225. *P. tibetica*

7b. Corolla 1.2–2 cm, beak of galea often S-shaped; flowers without white spots.

8a. Flowers yellow, with purplish beak, 1.6–2 cm; calyx 6–7 mm, pubescent ................. 224. *P. torta*

8b. Flowers purplish red or red throughout, 1.2–1.6 mm; calyx 3–6 mm, glabrescent ... 228. *P. davidii*


瘠瘦马先蒿 ji shou ma xian hao

Herbs annual or biennial, 20–30 cm tall, glabrescent, scarcely drying black. Stems 6–12, ascending, often short branched apically, with lines of hairs. Leaves mostly on stem, alternate or pseudo-opposite; petiole to 1 cm or distal ones ± sessile, glabrescent; leaf blade ovate-elliptic to narrowly oblong, 3–5 × 1–1.5 cm, glabrous on both surfaces, abaxially sparsely whitish scurfy, pinnatisect; segments 5–7 pairs, ovate to lanceolate-oblong, incised-pinnatifid or double dentate. Inflorescences racemose, to 10 cm; bracts leafflike. Pedicel ca. 2 mm. Calyx 6–7 mm, glabrous, 1/3 cleft anteriorly; lobes 3, unequal, posterior one acicular, lateral pair larger, toothed. Corolla white, with reddish beak, 1.1–1.3 cm; tube erect, ca. 2 × as long as calyx; galea ± falcate, slightly crested, not twisted; beak straight, ca. 4 mm, slightly 2-cleft at apex, not ciliate; lower lip nearly as long as galea. Filaments glabrous. Capsule ovoid, ca. 1 cm × 5–6 mm. Seeds narrowly ovoid, ca. 2 mm. Fl. Jun–Jul, fr. Jul–Sep.

- Grassy slopes; ca. 2900 m. Sichuan, NW Yunnan.


尖果马先蒿 jian guo ma xian hao

Herbs perennial, 20–40 cm tall, erect, sparsely pubescent, drying black. Roots fleshy. Stems 1 or 5–10, branched basally or unbranched, with lines of hairs.

- NW Yunnan.
Leaves alternate. Basal leaves withering early, petiolate or distal ones ± sessile; petiole to 2 cm; leaf blade linear-oblong or lanceolate-oblong, 4–7(–10) × 0.8–2 cm, abaxially glabrous and whitish scurfy, axially sparsely pubescent or glabrescent, pinnatisect; segments 7–15 pairs, linear-lanceolate, pinnate-double dentate. Inflorescences racemose, to 13.5 cm, lax; bracts leaflike. Proximal pedicels to 6 mm, slender. Calyx 4–5 mm, ca. 1/2 cleft anteriorly, glabrous; lobes 3, equal, entire. Corolla white, with purplish beak, 1.4–1.8 cm; tube erect, ca. 2 × as long as calyx, sparsely pubescent; galea bent at a right angle apically, distinctlycrested, recurved; beak falcate, to 7 mm, slender, clearly crested; lower lip long ciliate. Filaments pubescent. Capsule lanceolate-oblong, ca. 1.3 cm × 5 mm. Fl. May–Aug, fr. Aug–Oct.


蒙氏马先蒿 meng shi ma xian hao
Herbs perennial, 50–70(–90) cm tall, erect, pubescent, drying black. Roots ± fleshy. Stems single, unbranched. Basal leaf petiole 5–10 mm; leaf blade oblone-lanceolate to linear-lanceolate, 8–14(–20) × 2–4 cm, sparsely pubescent along veins on both surfaces, pinnatifid to pinnatipartite; segments 14–18 pairs, triangular-ovate to lanceolate, margin double dentate. Stem leaves 4–6, alternate, similar to basal leaves but smaller. Inflorescences racemose, to 35 cm, many flowered; bracts leaflike, proximal ones longer than flowers. Pedicel 1–3.5(–4) cm, elongating in fruit, slender, densely pubescent. Calyx 6–8 mm, sparsely long pubescent, 1/2 cleft anteriorly; lobes 3, unequal, ca. 1/4 as long as tube, posterior lobe small, entire, lateral lobes dentate, sparsely pubescent. Corolla white to purple-red, 1.8–2.2 cm; tube erect, 1.2–1.4 cm; galea ± bent at a right angle apically, clearly crested; beak pointing forward and bent downward near apex; lower lip long ciliate. Filaments pubescent. Capsule oblique-ovoid, 8–10 mm. Fl. Jul–Aug, fr. Aug–Sep.


斯氏马先蒿 si shi ma xian hao
Herbs ca. 30(–50) cm tall. Stems single, rigid, freely long branched apically, pubescent. Stem leaves alternate; petiole 1–1.5 cm, slender, sparsely pubescent; leaf blade ovate or ovate-oblong, ca. 2.5 × 1.3 cm, abaxially glabrous, adaxially sparsely pubescent or glabrous, pinnatisect; segments 5–7 pairs, linear-oblong or lanceolate, pinnatifid, dentate. Inflorescences racemose, 2–3(–5) cm, 6– or 7(–10)-flowered; bracts 6–7 × 5–6 mm, often deeply 3-cleft. Pedicel 1–2 mm, slender. Calyx 4–5 mm, 1/2 cleft anteriorly; lobes 3, unequal, ca. 1/2 as long as tube, posterior lobe triangular, entire, lateral pair larger, palmately 3-lobed. Corolla rose, ca. 1 cm; tube erect, ca. 2 × as long as calyx; galea twisted; beak often semicircular, ca. 4 mm; lower lip long ciliate. Filaments pubescent apically. Capsule oblong, ca. 1 cm. Fl. Jul, fr. Aug–Oct.


扭旋马先蒿 niu xuan ma xian hao
Herbs perennial, 20–40(–70) cm tall, not drying black. Roots ± fleshy. Stems 1 or 3(–7), erect, unbranched apically, sparsely pubescent apically. Basal leaves numerous, often withering early. Stem leaves alternate or pseudo-opposite; proximal petioles to 5 cm, distal ones ca. 5 mm; leaf blade oblone-lanceolate to linear-oblong, 2–9.5 × 0.7–2.5 cm, glabrous on both surfaces, pinnatisect; segments 9–16 pairs, lanceolate to linear-oblong, dentate. Inflorescences racemose, to 18 cm, many flowered; bracts leaflike, proximal ones longer than calyx. Pedicel 1–2.5 mm, slender, pubescent. Calyx 6–7 mm, 1/2 cleft anteriorly, pubescent; lobes 3, unequal, posterior one ± entire, lateral pair larger, flabellate, dentate. Corolla yellow, with purple or purple-red galea, 1.6–2 cm; tube erect, ca. as long as calyx, pubescent; galea twisted; beak S-shaped, slender; lower lip ca. 1 × 1.3 cm, long ciliate. Filaments pubescent. Capsule ovoid, 1.2–1.6 cm × 4–6 mm. Fl. Jun–Aug, fr. Aug–Sep.


西藏马先蒿 xi zang ma xian hao

Pedicularis dielsiana H. Limpricht, not Bonati; P. limbriuctii Fedde; P. ludovicii H. Limpricht.

Herbs perennial, to 25 cm tall, drying slightly black. Roots ca. 6 cm, ± fleshy. Stems usually 4–10(–15), central stem erect, outer ones often procumbent to ascending, densely gray pubescent. Basal leaves few or withering early; petiole to 4 cm; leaf blade oblong-oblong-lanceolate to linear-oblong, 3–5 cm × 7–12 mm, abaxially long pubescent along veins, adaxially sparsely long pubescent, pinnatifid to pinnatisect; segments 9–13 pairs, ovate or long ovate, dentate. Stem leaves often pseudo-opposite, alternate apically, similar to basal leaves but smaller. Inflorescences racemose, 2–4(–10) cm; bracts leaflike, proximal ones shorter than pedicel. Pedicel to 1 cm, slender, densely pubescent. Calyx 6–7 mm, densely pubescent, 1/2 cleft anteriorly; lobes 3, ± equal. Corolla reddish, with white spots on lower lip, ca. 1 cm; tube erect, ca. as long as calyx; galea twisted; beak semicircular, 5–6 mm; lower lip not ciliate. Filaments pubescent. Capsule ca. 8 mm. Seeds ca. 3.6 mm. Fl. Jun–Jul, fr. Aug.
针齿马先蒿  zhen chi ma xian hao
Herbs perennial, low, less than 7 cm tall. Roots many, to 6 cm. Stems single, densely glandular pubescent. Basal leaf petiole to 2 cm, sparsely pubescent; leaf blade oblong-lanceolate, ca. 1.7 cm × 7 mm, abaxially whitish scurfy, adaxially glabrous, pinnatisect; segments 7 or 8 pairs, ovate-oblong to ovate, incised-dentate. Stem leaves 1 or absent. Inflorescences sub-capitate, 5–8-flowered, pedicellate or distal flowers sessile. Pedicel to 7 mm. Calyx ca. 6 mm, 1/2 cleft anteriorly; tube barely 4 mm; lobes 3, unequal, posterior one entire and acuminate, lateral pair dentate. Corolla tube 1.1–1.4 cm, pubescent externally; galea twisted; beak semicircular or S-shaped, ca. 6 mm; lower lip ca. 1.1 × 1.3 cm. Filaments glabrous. Fl. Jul, fr. Aug.

长萼马先蒿  chang e ma xian hao
Herbs perennial, ca. 8 cm tall, drying slightly black. Roots fusiform, fleshy. Stems usually numerous, outer ones often procumbent to ascending. Basal leaves numerous, fascicled; petiole 2–4 cm, glabrescent; leaf blade ovate-oblong, 1–2.5 cm, pinnatisect; segments 5–7 pairs, ovate to orbicular, incised-toothed. Stem leaves few, 1 or 2. Inflorescences capitulate, 6–10-flowered; bracts leaflike. Pedicel 1–2 mm. Calyx oblong, 1/2 cleft anteriorly, glabrous, usually purplish spotted; tube to 8 mm; lobes 5, unequal. Corolla pale red, ca. 2 cm; tube barely exceeding calyx, sparsely villous; galea twisted; beak slightly S-shaped apically, slender; lower lip 8–11 mm × 1.1–1.3 cm, ciliate. Filaments pubescent. Capsule ca. 1 cm × 4–5 mm. Fl. Jul–Aug, fr. Sep.

大卫氏马先蒿  da wei shi ma xian hao
Herbs perennial, 15–30(–50) cm tall, densely pubescent, drying slightly black. Roots fleshy. Stems single or usually 3 or 4, erect, few branched basally, densely rust colored pubescent. Basal leaves usually withering early. Stems branching basally or above. Leaves alternate or proximal ones pseudo-opposite, petiolate, ovate-oblong, pinnatisect. Inflorescence racemose. Flowers often long pedicellate. Calyx deeply cleft anteriorly, 3–5-lobed. Corolla often yellowish white; galea strongly twisted laterally at base; beak bent upward, S-shaped or semicircular, slender.

1a. Calyx lobes 5; middle lobe of lower corolla lip ca. 2 × 1.5 mm, neither prominently projecting nor stipitate at base

228a. **Pedicularis davidii** var. **davidii**
大卫氏马先蒿(原变种)  da wei shi ma xian hao (yuan bian zhong)
Calyx lobes 3, longer than wide, margin entire.

228b. **Pedicularis davidii** var. **pentodon**
五齿大卫氏马先蒿  wu chi da wei shi ma xian hao
Calyx lobes 5, longer than wide, margin entire.

228c. **Pedicularis davidii** var. **platyodon**
宽齿大卫氏马先蒿  kuan chi da wei shi ma xian hao
Calyx lobes 3, wider than long, distinctly dentate.

细裂系  xi lie xi
Stems branching basally or above. Leaves alternate or proximal ones pseudo-opposite, petiolate, ovate-oblong, pinnatisect. Inflorescence racemose. Flowers often long pedicellate. Calyx deeply cleft anteriorly, 3–5-lobed.

1a. Calyx lobes 5; middle lobe of lower corolla lip ca. 2 × 1.5 mm, neither prominently projecting nor stipitate at base

229. **P. souliei**
1b. Calyx lobes 3; middle lobe of lower corolla lip ca. 5 × 4 mm, prominently projecting and narrowed to a stipitate base.

2a. Beak of corolla long, S-shaped; capsule ca. 10 mm ......................................................... 232. *P. petitmenginii*

2b. Beak of corolla shorter, semicircular; capsule 4–5 mm

3a. Corolla purple-red, galea with a 2-auriculate protuberance; calyx lobes palmatipartite; pedicel to 1.4 cm ................................................................. 230. *P. honanensis*

3b. Corolla yellow, galea without a 2-auriculate protuberance; calyx lobes unequal, posterior lobe usually linear and entire; pedicel to 2.5 cm ............................................. 231. *P. dissecta*


**苏氏马先蒿** su shi ma xian hao

Herbs annual or biennial, 20–30 cm tall, drying slightly black. Stems usually branched basally; branches 6–10, weak, often ascending, sparsely pubescent. Proximal leaves pseudo-opposite, distal ones alternate; petiole 15–25 cm; leaf blade lanceolate-oblong or ovate-oblong, 3–4 × 1–1.5 cm, abaxially sparsely pubescent along midvein or glabrous, adaxially sparsely pubescent, pinnatisect; segments 9–11 pairs, long oval or ovate-lanceolate, pinnatifid to pinnatifidate, incised-dentate. Inflorescences racemose, 1/3–1/2 as long as branches, lax; bracts leaflike. Pedicel 1–2 cm, weak, densely pubescent. Calyx 3–5 mm, glabrous or pubescent along veins, 1/2 cleft anteriorly; lobes 5, unequal, posterior one entire, lateral lobes larger, entire. Corolla reddish or whitish, ca. 1 cm; tube erect, longer than calyx; galea twisted; beak pointed upward, S-shaped, ca. 7 mm; lower lip ciliate, middle lobe ca. 2 × 1.5 mm. Filaments pubescent. Capsule ca. 5 mm.

- Swampy places. W Sichuan.


**河南马先蒿** he nan ma xian hao

Herbs perennial, 20–26 cm tall, glabrescent, drying ± black. Roots fleshy. Stems usually single or 3 or 4, many branched; branches slender, pubescent. Basal leaves usually withering early; petiole ca. 2 cm. Stem leaves alternate; petiole 6–10 mm; leaf blade long ovate or ovate-oblong, 3–5 × 1.5–1.7 cm, glabrous on both surfaces, pinnatisect; segments 7–9 pairs, widely spaced, lanceolate-oblong to linear-lanceolate, pinnate-dentate. Inflorescences racemose, more than 1/3 as long as stems or branches, lax; bracts leaflike. Pedicel to 1.4 cm. Calyx 4–5 mm, densely downy, 1/2 cleft anteriorly; lobes 3, ± equal, pinnatifidate. Corolla purple-red, ca. 1 cm; tube 4–5 mm; galea falcate, with a 2-auriculate protuberance; beak semicircular, 5–6 mm; lower lip ca. 7 × 9 mm, ciliate, middle lobe ca. 5 × 4 mm, prominently projecting and narrowed to a stipitate base. Filaments villous. Capsule ca. 5 mm. Fl. Jul–Aug, fr. Aug.

- Thickets, margins of woods; ca. 1400 m. W Henan.


**全裂马先蒿** quan lie ma xian hao

*Pedicularis pettimenginii* Bonati var. *dissecta* Bonati, Bull. Soc. Bot. France 55: 245. 1908; *P. davidii* Franchet var. *flaccida* Diels ex Bonati. Herbs perennial, 20–35 cm tall, pubescent or glabrous, drying black. Roots fleshy. Stems usually 4–10, sometimes single, central stem erect, outer stems usually procumbent to ascending, branched or not, slender. Basal leaves withering early; petiole 3–3.5 cm, usually persistent. Stem leaves alternate; petiole 1.5–2 mm; leaf blade ovate-oblong, 3–3.5 × 1.2–1.6 cm, glabrous on both surfaces, pinnatisect; segments 6–9 pairs, widely spaced, ovate to linear-lanceolate, pinnatifid or incised-double dentate. Inflorescences racemose, to 1/2 as long as branches, lax; bracts leaflike. Pedicel to 2.5 cm, slender, elongating and curving in fruit, densely pubescent. Calyx 4–6 mm, glabrous, 1/2 cleft anteriorly; lobes 3, unequal, posterior one linear, entire, lateral pair pinnatifidate. Corolla yellow, 1–1.2 cm; tube erect, slightly longer than calyx; galea bent at a right angle, lacking auriculate protuberance; beak semicircular, apex bent upward, ca. 6 mm; lower lip ciliate, middle lobe ca. 5 × 4 mm, prominently projecting and narrowed to a stipitate base. Filaments villous. Capsule 4–5 mm. Fl. Jun–Aug, fr. Aug.

- Rocks; ca. 3000 m. SW Shaanxi.


**伯氏马先蒿** bai shi ma xian hao

Herbs perennial, 15–40–(60) cm tall, pubescent or glabrescent, drying black. Stems usually 4–6, branching basally or above. Basal leaves withering early. Proximal stem leaves pseudo-opposite, distal ones alternate; petiole 1.5–2.5 cm; leaf blade ovate-oblong to linear-oblong, 3–5.5 × 1–1.7 cm, abaxially villous along veins, adaxially sparsely pubescent or glabrescent, pinnatisect; segments 8–12 pairs, linear-lanceolate to narrowly oblanceolate, pinnatifid, serrate. Inflorescences racemose, 1/2 or 1/3 as long as stems and branches; bracts leaflike. Pedicel 2–3 cm, slender, densely pubescent. Calyx 4–5 mm, white villous externally, 1/2 cleft anteriorly; lobes 3, unequal, posterior lobe sub-entire, narrow, lateral pair larger, pinnatifidate. Corolla whitish or yellowish with purple or purple-red galea, 1.1–1.5 cm; tube erect, 6–7 mm; galea bent at a right angle apically, twisted; beak linear, S-shaped pointing upward, 5–6 mm; lower lip ciliate, middle lobe ca. 5 ×


**丰管系 feng guan xi**

Herbs erect, more than 10 cm tall, villous. Stems single, rigid or flexuous. Basal leaves numerous, long petiolate. Stem leaves few, alternate or ± opposite, smaller than basal leaves, linear-oblong, pinnatifid. Inflorescences short racemose, centripetal. Calyx deeply cleft anteriorly; 5-lobed. Corolla purple; tube ca. 2.5 × as long as calyx; galea falcate, marginally 2-toothed; beak straight.

- One species: endemic to China.


**丰管马先蒿 feng guan ma xian hao**

Herbs perennial, to 20 cm tall. Roots fascicled, filiform. Stems unbranched. Basal leaves numerous; petiole to 6 cm; leaf blade linear-oblong to 7 × 1.7 cm, abaxially villous along midvein, adaxially glabrous, pinnatisect; segments 12–16 pairs, oblong, crenately pinnatifid, denticulate. Stem leaves usually 2 or 4, similar to basal leaves but smaller and shorter petiolate. Inflorescences to 6 cm, lax basally; bracts leaflike. Pedicel to 1 cm, villous. Calyx ca. 1.2 cm, slightly pubescent; lobes 5, unequal, posterior smallest, posterior-lateral pair largest, palmately incised-dentate. Corolla purple, ca. 3.5 cm; tube erect, ca. 2.8 cm, slightly pubescent; galea with 1 distinct reflexed marginal tooth on one side; beak ± filiform, straight, ca. 4 mm; lower lip ciliate. Filaments pubescent apically. Fl. Jul, fr. Aug.

- Rocky slopes; ca. 3500 m. NW Yunnan.


**拟鼻花系 ni bi hua xi**

Stems erect or spreading, branched basally or unbranched. Leaves basal and on stem. Basal leaves long petiolate, linear-oblong, pinnatisect. Stem leaves few, alternate. Inflorescences slightly capitate or racemose. Calyx lobes 5. Corolla purple, rose, or crimson, to 2.8 cm; tube ca. as long as calyx; galea bent at a right angle apically; beak semicircular or S-shaped, very long, slender.

Two species: China, India, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; both species in China.

1a. Calyx 1/2 cleft anteriorly, usually with purplish dots, posterior lobe entire, lateral lobes ovate, serrate; galea ± erect basally ................................................................. 234. *P. rhinanthoides*

1b. Calyx slightly cleft anteriorly, without purplish dots, lobes all serrate; galea curving from its base 235. *P. cyclorhyncha*


**拟鼻花马先蒿 ni bi hua ma xian hao**

Herbs perennial, 4–30(–40) cm tall, drying slightly black. Roots ± fusiform, fascicled, fleshy. Stems 1 to numerous, erect or flexuous, unbranched, glabrescent, shiny. Basal leaves usually densely fascicled; petiole 2–5 cm; leaf blade linear-oblong, pinnatisect; segments 9–12 pairs, ovate, glabrescent, dentate, teeth callose. Stem leaves few, shorter petiolate than basal leaves. Inflorescences short racemose, sometimes to 8 cm; bracts leaflike. Pedicel to 1(–1.5) cm, glabrous. Calyx long ovate, 1.2–1.5 cm, 1/2 cleft anteriorly, often with purplish dots; lobes 5, unequal, posterior one lanceolate and ± entire, lateral lobes ovate and serrate. Corolla rose to violet-purple, to 1.7–2.5(–3) cm, to ca. 2 × longer than calyx, pubescent; tube erect; galea erect basally, ± bent at a right angle apically; beak S-shaped to semicircular, 7–10 mm; lower lip 1.4–2.8 cm, wide, ciliate or not. Filaments 2 pubescent, 2 glabrous. Capsule lanceolate-ovoid, ca. 1.9 cm × 6 mm. Seeds ca. 2 mm. Fl. May–Jul, fr. Jul–Sep. 2n = 16.

- Moist alpine meadows, boggy places along streams, among small *Rhododendron* and other shrubs in moist locations on open hillsides; 2300–5000 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [India, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

1a. Beak of corolla to 7 mm, usually semicircular; lower lip 1.4–1.7 cm wide 234a. subsp. *rhinanthoides*

1b. Beak of corolla to 8–10 mm, usually S-shaped; lower lip 2.5–2.8 cm wide.

2a. Bracts and upper petioles glabrous to slightly villous; lower corolla lip not ciliate

2b. Bracts and upper petioles villous; lower corolla lip ciliate ............ 234c. subsp. *tibetica*

**234a. Pedicularis rhinanthoides** subsp. *rhinanthoides* subsp. *rhinanthoides* (原亚种) 

Moist alpine meadows, boggy places along streams, among small *Rhododendron* and other shrubs in moist locations on open hillsides; 2300–5000 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [India, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

1a. Beak of corolla to 7 mm, usually semicircular; lower lip 1.4–1.7 cm wide 234a. subsp. *rhinanthoides*

1b. Beak of corolla to 8–10 mm, usually S-shaped; lower lip 2.5–2.8 cm wide.

2a. Bracts and upper petioles glabrous to slightly villous; lower corolla lip not ciliate

2b. Bracts and upper petioles villous; lower corolla lip ciliate ............ 234c. subsp. *tibetica*
Bracts and upper petioles glabrous to slightly ciliate. Corolla beak usually semicircular, to 7 mm; lower lip 1.4–1.7 cm wide. Moist meadows; 3000–5000 m. Xinjiang [India, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

大唇拟鼻花马先蒿 da chun ni bi hua ma xian hao

Pedicularis labellata Jacquemont, Voy. Inde 118. 1844; P. biondiana Diels; P. rhinanthoides subsp. labellata (Jacquemont) P. C. Tsoong; P. rhinanthoides var. labellata (Jacquemont) Prain.

Bracts and upper petioles villous. Corolla beak usually S-shaped, to 8–10 mm; lower lip 2.5–2.8 cm wide, ciliate. Fl. May–Jul, fr. Aug–Sep. Alpine moist meadows and boggy places along streams, among small Rhododendron and other shrubs in moist locations on open highlillsides; 3000–4500 m. SW Sichuan, NW Yunnan.

环喙马先蒿 huan hui ma xian hao

Herbs to 40 cm tall, glabrescent except for inflorescences, drying black. Stems single, erect or slightly flexuous, usually branched basally. Leaves alternate, mostly basal, short petiolate or sessile; proximal petioles to 7 cm, slender; leaf blade linear-lanceolate, 2–6 cm × 7–9 mm, pinnatisect; segments 10–14 pairs, ovate, pinnatifid and incised-double dentate. Inflorescences racemose, to 10 cm, lax basally; bracts leaflike, longer than calyx. Pedicel erect, ca. 5 mm. Calyx to 1.2 cm, sparsely pubescent, shallowly cleft anteriorly; lobes 5, unequal, all serrate, lateral ones often deeply divided. Corolla crimson, 2.5–2.8 cm; tube erect, ca. as long as calyx, sparsely pubescent; galea curving from base ± in a circle; beak linear, ca. 8 mm, curved, forming a complete circle with galea; lower lip ca. 1 × 2 cm, slightly ciliate. Filaments 2 pubescent apically, 2 glabrous throughout. Fl. Jun–Jul, fr. Aug.

双生系 shuang sheng xi

Herbs low. Stems 1 to several, erect or ascending, unbranched. Leaves opposite, oblong-lanceolate, pinnatipartite. Inflorescences short racemose. Calyx lobes 5. Corolla purplish red with yellow galea; tube ca. 2 × as long as calyx; galea falcate; beak short, slender, usually S-shaped; middle lobe of lower lip hoodlike at apex.

One species: endemic to China.

双生马先蒿 shuang sheng ma xian hao

Herbs annual, to 15 cm tall, not drying black. Stems woody, whitish pubescent. Leaves 1–3 pairs, opposite; petiole to 1.5 cm basally, whitish long pubescent; leaf blade 1–1.8 cm × 5–8 mm, pinnatifipartite; segments 5–8 pairs, narrowly oblong, incised-dentate. Inflorescences 3–6-flowered; bracts leaflike. Pedicel ca. 2 mm. Calyx tube 5–8 mm, membranous, whitish villous along veins; teeth unequal, ciliate. Corolla purplish red, with ± yellow galea basally; tube straight, ca. 1.4 cm, to more than 2 × as long as calyx tube, pubescent; galea falcate, nearly as long as tube; beak ca. 3.5 mm; lower lip ca. 1.1 × 1.8 cm, ciliate, middle lobe broadly ovate, hoodlike at apex. Filaments 2 villous, 2 glabrous. Fl. Aug, fr. Sep.

Alpine meadows; ca. 4000 m. N Sichuan.

拟篦齿系 ni bi chi xi

Stems branched or not. Leaves in whorls of 4; leaf blade ovate-lanceolate to linear-oblong, pinnatifipartite to pinnatisect. Inflorescences racemose. Calyx lobes 5. Corolla tube as long as or slightly exceeding calyx; galea bent apically; beak semicircular or S-shaped, long; lower lip with hoodlike middle lobe.

Three species: China, C Asia; two species in China.

1a. Plants to 40 cm tall; calyx lobes linear, ± entire; corolla purplish red; filaments glabrous . 237. P. pectinatiformis
1b. Plants barely 20 cm tall; calyx lobes 1 entire and other 4 flabellate, serrate; corolla yellow; filaments densely pubescent ............................................................... 238. P. weixiensis

densely pubescent ........................................................................................................ 238. P. weixiensis

拟篦齿马先蒿 ni bi chi ma xian hao

Herbs perennial, to 40 cm tall, scarcely drying black. Stems 1 to several, erect or ± ascending, branched
basally or unbranched; branches whorled, short, slender, with lines of hairs. Leaves in whorls of 4; petioles to 4 cm, winged, pubescent; leaf blade ovate-lanceolate to linear-oblong, ca. 5 cm, glabrescent on both surfaces, pinnatisect; segments 6–8 pairs, pinnatifid, dentate. Inflorescences interrupted; bracts leaflike basally, broadly ovate apically. Pedicel barely 1–2 mm. Calyx to 1 cm, membranous, slightly cleft anteriorly, whitish villous along veins; lobes 5, unequal, linear, ± entire, posterior one smaller than lateral lobes. Corolla purplish red, with yellowish tube apex and lower lip base; tube erect, ca. 1 cm; galea bent at a right angle; beak semicircular or S-shaped, ca. 1 cm, slender; lower lip ca. 1.1 × 1.4 cm, ciliate, middle lobe smaller than lateral lobes, hoodlike. Filaments glabrous. Fl. Aug, fr. Sep.


4a. Plants (6–)10–20 cm tall; inflorescences to 9.5 cm; corolla 2.2–2.5 cm; filaments pubescent basally ................................................................. 249. *P. polyodontia*

4b. Plants 2–6 cm tall; inflorescences 2–2.5 cm; corolla 1.9–2 cm; filaments glabrous .............. 250. *P. lyra*ta

1b. Galea with 1 marginal tooth or sometimes additionally obscurely denticulate on each side; lower corolla lip margin entire or slightly praemorse.

5a. Corolla with dark colored spots; lower lip margin entire. .......................... 6a. Plants (10–)20–30(–50) cm tall; roots few, fusiform, fleshy; leaves in whorls of 3 or 4 .......................... 240. *P. stenocorys*

6b. Plants less than 7 cm tall; roots numerous, slender; leaves opposite ......................... 241. *P. dolichoglossa*

5b. Corolla without spots; lower lip margin ± praemorse.

7a. Stems and branches glabrous or barely with 2 lines of hairs.

8a. Leaves to 12 × 10 mm; stems 4–15 cm tall; middle lobe of lower corolla lip ca. as long as lateral lobes .......................................................................................................................... 242. *P. cymbalaria*

8b. Leaves 2–6 × 1.5–4 mm; stems 3.5–4.5 cm tall; middle lobe of lower corolla lip ca. 2 × as long as lateral lobes .......................................................................................................................... 243. *P. inaequilobata*

7b. Stems and branches densely pubescent.

9a. Corolla yellow; lobes of lower lip nearly equal ....................................................... 244. *P. tomentosa*

9b. Corolla red to rose; lobes of lower lip unequal, middle lobe distinctly largest.

10a. Leaves ovate to oblong-ovate, 1.5–2.5 cm × 8–12 mm, crenate-dentate; filaments glabrous ................................ ............................................................................................ 245. *P. rizhaoensis*

10b. Leaves triangular or triangular-ovate, 0.8–1.2 cm × 6–8 mm, pinnatifid; filaments sparsely pubescent basally ................................................................. 246. *P. deltoidea*


狭盔马先蒿  xia kui ma xian hao

Herbs perennial, (10–)20–30(–50) cm tall, not drying black. Roots few, fusiform, fleshy. Stems 1 to several, erect, branched basally or unbranched, pubescent, with 4 lines of hairs. Leaves in whorls of 3 or 4; petiole to 2–2.8 cm, slender, sparsely pubescent; leaf blade oblong-lanceolate to ovate-oblong, 0.5–6 × 0.6–2 cm, abaxially whitish scurfy, adaxially glabrescent, pinnatisect to pinnatipartite; segments 4–14 pairs, ovate to oblong-ovate, few incised-dentate. Inflorescences spicate, 4–10 cm, sometimes interrupted basally; bracts leaflike, whitish long ciliate. Calyx obovate, ca. 1 cm, slightly cleft anteriorly, whitish villous; lobes 5, unequal, posterior one smallest, triangular, entire, others ovate and serrate. Corolla pink to rose, usually with dark colored spots, 2–2.5(–3) cm; tube erect, slightly longer than calyx; galea slightly bent at middle, to 1.4–1.7(–1.9) cm × 1.8–3 mm, slender, sometimes with 1 marginal tooth or obscurely denticulate on each side; lower lip shorter than galea, densely long ciliate, entire. Filaments glabrous or 2 pubescent. Capsule obliquely lanceolate-ovoid, 1/4–1/3 exceeding calyx. Fl. and fr. Jul–Aug.

• Alpine meadows, slopes; 3300–4400 m. N and W Sichuan.

1a. Plants to 50 cm tall; stems sparsely pubescent; leaf blade oblong-lanceolate to ovate-oblong, 3–4(–6) cm, segments 10–14 pairs ..................................................... 240a. subsp. *stenocorys*

1b. Plants barely 10 cm tall; stems pubescent with long blackish rust colored hairs; leaf blade ovate, 5–16 mm, segments 4–8 pairs ................................................................. 240b. subsp. *melanotricha*

**240a. Pedicularis stenocorys** subsp. *stenocorys* 狭盔马先蒿(原亚种)  xia kui ma xian hao (yuan ya zhong)

**Pedicularis porphyrantha** H. L. Li; *P. pseudostenocorys* Bonati.

Plants to 50 cm. Stems sparsely pubescent. Leaf blade oblong-lanceolate to ovate-oblong, 3–4(–6) cm; segments 10–14 pairs.

• Alpine meadows, slopes; 3300–4400 m. N and W Sichuan.

This subspecies includes two varieties: var. *stenocorys* with galea 1.4–1.7 cm × ca. 3 mm, and var. *augustissima* P. C. Tsoong with galea ca. 1.9 cm × 1.8 mm.


黑毛狭盔马先蒿  hei mao xia kui ma xian hao

Plants low, barely 10 cm. Stems pubescent with long, blackish, rust colored hairs. Leaf blade ovate, 0.5–1.6 cm; segments 4–8 pairs.

• Alpine meadows; ca. 3900 m. W Sichuan.

不等裂马先蒿 | 不等裂马先蒿 | 不等裂马先蒿
---|---|---
Herbs perennial, to 7 cm tall, drying ± black. Roots numerous, slender. Stems single, black, with 2–4 internodes, long pubescent with dark brown hairs. Leaves few, opposite; petiole 1.5–3 cm, rust colored pubescent; leaf blade elliptic-ovate, (0.4–)1.5 cm × ca. 8 mm, abaxially whitish scurfy, adaxially glabrous, pinnatifid; segments 2–4 pairs, few segments incised-dentate. Inflorescences to 4 cm, subcapitate, many flowered; bracts leaflike, proximal ones to 1.3 cm. Calyx ca. 1 cm; lobes 5, unequal, posterior lobe triangular, entire, others larger, dentate. Corolla yellow, with dull colored spots, 2.3–2.5 cm; tube erect, slightly longer than calyx; galea falcate apically, to 2 cm, with 1 marginal tooth on each side; lower lip to 4.5 × 8 mm, long ciliate, entire, middle lobe rounded, smaller than lateral lobes, projecting. Filaments pubescent basally.

• NW Yunnan.


舟型马先蒿 | 舟型马先蒿 | 舟型马先蒿
---|---|---
Herbs annual or biennial, 4–15 cm tall, drying ± black. Stems several, diffuse or procumbent, many branched basally; branches opposite, glabrous or with 2 lines of hairs. Leaves opposite; petiole 4–6(–20) mm, sparsely long pubescent; leaf blade reniform to cordate-ovate, 1.2–1.3 cm, ca. 1/3 exceeding calyx. Glabrous or pubescent throughout, drying ± black. Stems erect, unbranched, slightly pubescent with lines of dense rust colored hairs. Leaves sparse, opposite; petiole 5–10(–20) mm, slender. Calyx 0.9–1.2 cm, densely pubescent, slightly cleft anteriorly; lobes 5, unequal, posterior lobe smallest, dentate. Corolla yellowish white to rose, 2–2.5 cm; tube erect, to 1.2 cm; galea falcate apically, margin 2-toothed, apex navicular; lower lip shorter than galea, margin ± praemorse, middle lobe ca. as long as lateral lobes. Filaments glabrous or pubescent basally. Capsule obliquely lanceolate-oblong, 1.2–1.3 cm, ca. 1/3 exceeding calyx.

• Alpine meadows, rocky soils, shaded banks; 3400–4000 m. SW Sichuan, NW Yunnan.


不等裂马先蒿 | 不等裂马先蒿 | 不等裂马先蒿
---|---|---
Herbs annual, 3.5–4.5 cm tall, diffuse, not drying black. Stems slender, many branched, with 1 or 2 internodes and with 2 lines of hairs; branches opposite. Basal leaves withering early. Stem leaves few, opposite; petiole 4–9 mm; leaf blade ovate to oblong-ovate, 2–6 × 1.5–4 mm, abaxially sparsely whitish scurfy, adaxially densely glandular pubescent, pinnatifid; segments 3 or 4 pairs, broadly ovate, incised-dentate. Inflorescences with only 1 or 2 flower pairs. Pedicel to 6 mm, slender, sparsely pubescent. Calyx ca. 8 mm, whitish long pubescent; lobes 5, unequal. Corolla yellow; tube erect, 9–10 mm; galea falcate apically, margin 2-toothed, ca. 1.4 cm; lower lip shorter than galea, margin ± praemorse, middle lobe ca. 2 × as long as lateral lobes, with ca. 1.5 mm stipitate base. Filaments pubescent basally.

• NW Yunnan.


绒毛马先蒿 | 红毛马先蒿 | 红毛马先蒿
---|---|---
Herbs annual, to 12 cm tall, tomentose throughout, not drying black. Stems usually 2–6, erect, slender, sometimes short branched apically. Leaves opposite or in whorls of 4, sessile, oblong-ovate to triangular-ovate, 1–1.3 cm × 5–7 mm, densely tomentose on both surfaces; segments 5–9 pairs, crenate-dentate or lobulate. Inflorescences short racemose, to 4 cm; bracts leaflike. Pedicel barely 1–2 mm. Calyx ca. 6 mm, membranous, tomentose; lobes 5, unequal, posterior lobe smallest, dentate. Corolla yellow, 2.2–2.5 cm; tube erect, slightly longer than calyx; galea falcate apically, 1.2–1.3 cm, with 1 marginal tooth on each side; lower lip ca. as long as galea, middle lobe nearly as long as lateral lobes, emarginate. Filaments glabrous.

• NW Yunnan.


日照马先蒿 | 日照马先蒿 | 日照马先蒿
---|---|---
Herbs perennial, barely 6 cm tall. Stems single or few, erect, unbranched, slightly pubescent with lines of dense rust colored hairs. Leaves sparse, opposite; petiole 5–10 mm, pubescent; leaf blade ovate to oblong-ovate, 1.5–2.5 × 0.8–1.2 cm, abaxially sparsely whitish scurfy, adaxially densely rust colored villous, crenate-dentate. Inflorescences racemose, 2–4-flowered; bracts leaflike. Pedicel ca. 3 mm. Calyx ca. 1 cm, slightly cleft anteriorly, densely villous; lobes 5, unequal, posterior one subulate, lateral lobes rounded and serrate. Corolla reddish, 2.4–2.7 cm; tube erect, slightly longer than calyx; galea falcate, with 1 marginal tooth on each side; lower lip ca. as long as galea, middle lobe nearly as long as lateral lobes, emarginate. Filaments glabrous.


• Grass on hillsides; ca. 4200 m. SW Sichuan.


三角叶马先蒿 | 三角叶马先蒿 | 三角叶马先蒿
---|---|---
Herbs annual or biennial, 8–20 cm tall, densely gray pubescent throughout, drying ± black. Stems erect,
single or many branched basally, sometimes branched apically; branches slender, rigid, hollow. Leaves opposite or in whorls of 3 or 4, petiolate or distal ones sessile; petiole to 5 mm, villous; leaf blade triangular or triangular-ovate, 0.8–1.2 cm × 6–8 mm, abaxially rust colored and gray scurfy, adaxially glabrescent, pinnatifid; segments 4 or 5 pairs, broadly ovate, margin double dentate. Inflorescences racemose, to 9 cm, many flowered; bracts leaflike, ca. as long as calyx. Pedicel 3–4 mm, slender, villous. Calyx 8–10 mm, pubescent; lobes 5, unequal. Corolla rose, 1.7–2.2(–2.4) cm; tube erect, ca. as long as calyx; galea falcate apically, with 1 marginal tooth on each side; lower lip shorter than galea, slightly praemorse, middle lobe larger than marginal tooth on each side.

2b. Branches of stems stout and rigid; leaves ± sessile or petiole 1–5 mm.

4b. Stems many branched basally; petiole of leaves to ca. 5 mm

247a. Pedicularis lutescens

浅黄马先蒿 (原亚种) qian huang ma xian hao (yuansheng)


Plants 20–40 cm. Leaf petiole 1–2.2 cm; leaf blade 2–5 cm. Galea with 4–6 marginal teeth on each side.

4a. Stems few branched basally or unbranched; leaves ± sessile or petiole to 1–2 mm 247c. subsp. brevifolia

4b. Stems many branched basally; petiole of leaves to ca. 5 mm

......................... 247d. subsp. ramosa


东川浅黄马先蒿 dong chuan qian huang ma xian hao


Plants 20–40 cm, simple or few branched. Leaves ± sessile or petiole to 2–3 mm; leaf blade 2–5 cm. Galea with 8–10 marginal teeth on each side.


短叶浅黄马先蒿 duan ye qian huang ma xian hao


Plants 10–20(–30) cm. Stems few branched basally or unbranched; branches rigid, stout. Leaves ± sessile or petiole to 1–2 mm; leaf blade ca. 2 cm. Galea with 4–6 marginal teeth on each side.


多枝浅黄马先蒿 duo zhi qian huang ma xian hao


Plants low, 10–20(–30) cm. Stems many branched basally; branches rigid, stout. Leaves ± sessile or petiole to 5 mm; leaf blade ca. 2 cm. Galea with 4–6 marginal teeth on each side.


长柄浅黄马先蒿 chang bing qian huang ma xian hao

Plants low, 10–20(–30) cm. Stem simple or branched; branches slender. Leaf petiole to 2–2.5 cm; leaf blade ca. 2 cm. Galea with 4–6 marginal teeth on each side.

• W Sichuan.


Herbs annual, 7–15 cm tall, pubescent, drying ± black. Stems single, erect, unbranched, with 4 lines of hairs. Basal leaves often withering early; petiole to 1 cm. Stem leaves few, in whorls of 4, sometimes opposite; petiole ca. 5 mm, villous; leaf blade ovate-oblong, 8–11 × 4–6 mm, pubescent on both surfaces, abaxially sparsely scurfy, pinnatifid; segments 6 or 7 pairs, oblong, margin ± entire. Inflorescences spicate, 3–6 cm, 5–11-flowered, flowers opposite, interrupted; bracts leaflike, slightly longer than calyx. Pedicel ca. 2 mm. Calyx 8–10 mm, membranous, slightly cleft anteriorly; lobes 5, unequal, posterior lobe triangular, entire, others ovate, deltate. Corolla yellow, 2.2–2.5 cm; tube erect, 1–1.2 cm; galea falcate apically, with 3–6 marginal teeth on each side near rounded apex; lower lip shorter than galea, middle lobe longer than lateral pair. Capsules pubescent basally. Capsule triangular to narrowly ovoid, to 1.4 cm. Fl. Jun–Aug, fr. Aug–Sep.

• NW Yunnan.


Pedicularis lyrata Prain ex Maximowicz var. cordifolia Franchet. Herbs annual, (6–)10–20 cm tall, densely pubescent throughout, not drying black. Stems erect. Leaves opposite, distal ones sometimes in whorls of 3; petiole of basal leaves to 1.7 cm, densely whitish villous. Stem leaves ± sessile or petiole ca. 5 mm; leaf blade ovate to ovate-lanceolate, sometimes long triangular-ovate, 1–3 cm × 5–11 mm, pubescent on both surfaces, pinnatifid; segments ovate or orbicular, crenate deltate. Inflorescences spicate, to 9.5 cm, many flowered; bracts leaflike. Calyx 1.2–1.5 cm, densely pubescent, slightly cleft anteriorly; lobes 5, unequal, posterior lobe shortest, entire, others obscurely dentate. Corolla yellow, 2.2–2.5 cm; tube erect, 1–1.2 cm; galea falcate apically, with 3–6 marginal teeth on each side near rounded apex; lower lip shorter than galea, middle lobe longer than lateral pair. Filaments pubescent basally. Capsule triangular to narrowly ovoid, to 1.4 cm. Fl. Jun–Aug, fr. Aug–Sep.

• Alpine meadows, open forests; 2700–4200 m. NW and W Sichuan.


Herbs annual, 2–6 cm tall, densely pubescent, ± drying black. Stems single, erect, unbranched. Leaves opposite. Petiole of basal leaves 0.7–1.5 cm, sparsely pubescent. Stem leaves ± sessile or petiole 2–3 mm; leaf blade oblong-lanceolate or ovate-oblong, 0.5–1.5 cm × 2–6 mm, pubescent on both surfaces, widely spaced crenate-deltate. Inflorescences racemose, 2–2.5 cm, few flowered; bracts leaflike, ± sessile. Pedicel 1–2 mm. Calyx 7–10 mm, slightly cleft anteriorly, densely villous; lobes 5, unequal, posterior lobe entire, others narrowly elliptic, obscurely serrate. Corolla yellow, 1.9–2 cm; tube erect, ca. as long as calyx; galea ± falcate at middle, ca. 1.1 cm, with 3–5 marginal teeth on each side near rounded apex; lower lip ca. 1/2 as long as galea, middle lobe largest. Capsules glabrous. Capsule obliquely lanceolate-ovoid. Fl. Jul–Aug, fr. Sep.

Alpine meadows; 3600–4200 m. Qinghai, W Sichuan, Xizang [Sikkim].


Herbs low, repent. Stem leaves opposite, petiolate, rounded, small; segments 3 or 4 pairs. Flowers axillary. Calyx lobes 5. Corolla tube ± elongated, ca. 2 × as long as calyx; beak straight, short.

• One species: endemic to China.


Herbs annual, slender, soft. Stems numerous, repent, ca. 20 cm, densely hirsute. Leaves opposite; petiole 1.5–10 mm, hirsute; leaf blade rounded, elliptic or elliptic-oblong, to 8 × 7(–8) mm, base truncate or slightly cordate, pinnatifid to pinnatipartite; segments 3 or 4 pairs, margin double dentate. Flowers solitary in axils. Pedicel ca. 5 mm. Calyx cylindric, ca. 5.5 × 2 mm, densely pubescent, slightly cleft anteriorly; lobes 5, ± equal, with long stipitate bases, deltate. Corolla 2–2.3 cm; tube ca. 1.6 cm; galea bent at a right angle apically; beak slightly 2-cleft at apex; lower lip ca. 6.5 × 7.5 mm, glabrous. Fl. May–Jun, fr. Jul–Aug.

• Swampy meadows; ca. 2300 m. E Xizang.

`duan ye xi`

Ser. *Alopecuroides* H. L. Li.

Herbs usually low. Stems several or single, unbranched. Basal leaves small or not persistent, ± elliptic to ovate; segments few. Stem leaves in whorls of 3 or 4 or sometimes opposite, long petiolate or some sessile; leaf blade ± oblong, pinnatifid to pinnatipartite. Inflorescences short or elongated. Calyx lobes 5, posterior one smallest. Corolla tube slightly longer than 2 × as long as calyx; galea with a long beak.

About six species: China, India (Himachal Pradesh), Kashmir, Nepal, Pakistan, Sikkim; four species in China.

1a. Lower corolla lip ciliate.

2a. Herbs perennial, 20–50 cm tall; calyx 5–8 mm; middle lobe of lower corolla lip not hoodlike; leaf segments

4–6 pairs .................................................................................................................. 252. *P. verbenifolia*

2b. Herbs annual, 55–70 cm tall; ca. 10 mm; middle lobe of lower corolla lip ± hoodlike; leaf segments

6–8 pairs .................................................................................................................. 254. *P. tsaii*

1b. Lower corolla lip glabrous.

3a. Leaves petiolate, ovate-oblong to lanceolate-oblong or ovate, to 12 × 3(–4) cm, segments 6–10 pairs ................................................................ ................................ 253. *P. smithiana*

3b. Leaves sessile, linear-lanceolate to lanceolate, to 5.5 × 1.4 cm, segments 12–14 pairs ....... 255. *P. alopecuros*


马鞭草叶马先蒿  ma bian cao ye ma xian hao

Herbs perennial, 20–50 cm tall, sparsely pubescent, drying black. Lateral roots 4–8, fleshy. Stems 1–7, erect, often unbranched, with 4 lines of hairs. Basal leaves often withering early, petiole to 4 cm. Stem leaves opposite or in whorls of 3(or 4); petiole 0.5–1.5(–3) cm; leaf blade ovate or ovate-oblong, 2–4(–6) × 1–1.5 cm, adaxially sparsely pubescent along midvein, pinnatifid; segments 4 or 6 pairs, ovate-oblong to triangular-ovate, dentate. Inflorescences spicate, 3–9(–17) cm; proximal bracts leaflike, distal ones lanceolate. Calyx 5–8 mm, slightly cleft anteriorly, villous along veins; lobes 5, unequal. Corolla purple, 1.6–2 cm; tube erect, ca. 2 × as long as calyx, glabrous; galea bent at a right angle; beak 5–6 mm, slender; lower lip ca. as long as galea, glabrous. Filaments glabrous. Capsule narrowly ovoid, 1.4–1.8 cm × 5–7 mm. Fl. Jul–Sep, fr. Aug–Oct.

● Alpine meadows, shrubs; 3100–4000 m. S Sichuan, NW Yunnan.


史氏马先蒿 shi shi ma xian hao  
*Pedicularis prealta* Bonati.

Herbs perennial, 25–50(–100) cm, glabrescent, ± drying black. Lateral roots 4–8, fleshy. Stems single or 2–4, erect, unbranched apically, with lines of hairs. Basal leaves withering early. Stem leaves in whorls of 3 or 4; petiole 1.3–3 cm; leaf blade ovate-oblong to lanceolate-oblong or ovate, to 12 × 3(–4) cm, adaxially sparsely pubescent and densely ciliolate along midvein, pinnatifid to pinnatipartite; segments 6–10 pairs, triangular-ovate to lanceolate-oblong, margin double dentate. Inflorescences spicate, 4–13 cm; bracts sessile, proximal ones leaflike, longer than flowers. Calyx 6–9 mm, villous, slightly cleft anteriorly; lobes 5, unequal. Corolla pale yellow, with purple galea and beak, 1.8–2.1 cm; tube erect, 8–10 mm; galea bent at a right angle apically; beak ca. 4 mm, slender; lower lip ca. as long as galea, glabrous. Filaments glabrous. Capsule obliquely ovoid, ca. 1.3 cm. Fl. May–Aug, fr. Jul–Aug.

● Alpine meadows, shrubs; 3000–4000 m. SW Sichuan, NW Yunnan.


蔡氏马先蒿 cai shi ma xian hao

Herbs annual, 55–70 cm tall, glabrescent, ± drying black. Stems single or few, erect, stout. Basal leaves withering early. Stem leaves in whorls of 4; petiole 4–10 mm, glabrous; leaf blade ovate-oblong, ca. 4.5 × 3 cm, glabrous on both surfaces, pinnatifid to pinnatifid to pinnatipartite; segments 6–8 pairs, ovate or oblong, deeply dentate. Inflorescences spicate, 6–8 cm; proximal bracts leaflike, distal ones ovate. Calyx ca. 1 cm, slightly cleft anteriorly, villous along veins; lobes 5, unequal. Corolla rose to purple throughout, ca. 2 cm; tube erect, ca. 1.5 × as long as calyx; galea bent at a right angle; beak decurved, ca. 4 mm, slender; lower lip 6–7 mm, ciliate, middle lobe ± hoodlike. Filaments glabrous. Capsule compressed, ovoid, 1.2–1.4 cm × 5–6 mm. Seeds 1.5–1.8 × ca. 0.8 mm. Fl. Aug, fr. Aug–Sep.

● Alpine meadows; 4000–4300 m. NW Yunnan.


狐尾马先蒿 hu wei ma xian hao

Herbs annual, 50–80 cm tall, stout, pubescent, not drying black. Roots ± fleshy. Stems single or few, erect,
often branched; branches opposite, slender. Stem leaves opposite or in whorls of 4, sessile; leaf blade lanceolate to linear-lanceolate, to 5.5 × 1–1.4 cm, both surfaces woolly, abaxially densely whitish scurfy, pinnatifid to pinnatipartite; segments 12–14 pairs, triangular to linear-oblong, crenate-dentate.

Inflorescences spicate; proximal bracts longer than calyx, short petiolate, ovate-lanceolate. Calyx 8–10 mm, densely villous, deeply cleft anteriorly; lobes 5, unequal. Corolla yellow, with purple-red galea, 1.8–2 cm; tube erect, to 2 × as long as calyx; galea bent at a right angle apically, slender; beak slender; lower lip shorter than galea, glabrous, apex of middle lobe hoodlike. Filaments glabrous or pubescent apically. Capsule barely enclosed by accrescent calyx, obliquely long ovoid, ca. 1 cm. Fl. May–Aug, fr. Aug–Sep.

- Alpine meadows; 2300–4000 m. Sichuan, N Yunnan.

1a. Filaments glabrous ......... 255a. var. alopecuros
1b. Filaments pubescent apically . 255b. var. lasiandra

255a. Pedicularis alopecuros var. alopecuros
狐尾马先蒿(原变种) hu wei ma xian hao (yuan bian zhong)
Filaments glabrous.
- Alpine meadows; 2300–4000 m. SW Sichuan, N Yunnan.

255b. Pedicularis alopecuros var. lasiandra
毛药狐尾马先蒿 mao yao hu wei ma xian hao
Filaments pubescent apically.
- Sichuan.

弱小系 ruo xiao xi

Ser. Parvifoliae H. Limpricht.

Herbs usually low. Stems erect, branched basally or unbranched. Leaves basal and on stem, opposite, rarely in whorls of 3, lanceolate to ovate, pinnatifid to pinnatisect. Inflorescences often capitate. Calyx lobes 5, posterior lobe smallest. Corolla tube longer than calyx but not exceeding 2 ×; beak straight or bent downward, long; galea margin toothless.

About 15 species: Bhutan, China, Myanmar, Nepal, Sikkim; nine species in China.

1a. Leaves lanceolate to linear-lanceolate, segments (7–)16–20 pairs ............................................. 260. P. pheulpinii
1b. Leaves ovate to oblong or orbicular, sometimes lanceolate in P. maxonii, segments usually less than 10 pairs.

2a. Leaves on stem, ± sessile.
3a. Plants with short internodes, usually less than 3 cm; lower corolla lip ciliate, middle lobe hoodlike ................................ ................................ ............................................................... 261. P. maxonii
3b. Plants with long internodes, to 8 cm; lower corolla lip glabrous, middle lobe not hoodlike.
4a. Leaf blade broadly ovate or triangular-ovate, segments 3 or 4 pairs; calyx ca. 8 mm  262. P. lamioides
4b. Leaf blade orbicular, segments 8–10 pairs; calyx 4–5 mm ................................ 263. P. rotundifolia

2b. Leaves both basal and on stem, usually petiolate or stem leaves sometimes ± sessile.
5a. Corolla tube ca. 3 × as long as calyx ................................ ................................ ..................... 264. P. chumbica
5b. Corolla tube less than 2 × as long as calyx.
6a. Galea with auriculate marginal protuberance on one side ................................ 257. P. sphaerantha
6b. Galea without auriculate marginal protuberance.

7a. Middle lobe of lower corolla lip not hoodlike ................................ 259. P. tenuicaulis
7b. Middle lobe of lower corolla lip hoodlike.

8a. Lateral calyx lobes 3-parted ................................ ................................ .......................................... 258. P. confertiflora
8b. Lateral calyx lobes ± entire or 1–3-toothed ................................ 256. P. debilis

弱小马先蒿 ruo xiao ma xian hao
Herbs annual, to 20 cm, some only 5–8 cm, finely pubescent, drying black. Roots fascicled, fibrous. Stems single, unbranched, with 2 lines of hairs. Leaves opposite, both basal and on stem; petiole slender, proximal ones 2–4.5 cm and wider, distal ones to 1–1.7 cm; leaf blade orbicular or ovate to oblong, 1.4–2.2 × 0.8–1.5 cm, abaxially glabrous, adaxially glabrescent, pinnatifid to pinnatipartite; segments 3–7 pairs, broadly ovate to lanceolate-ovate, pinnatifid or incised-double dentate. Inflorescences subcapitate; proximal bracts leaflike, distal ones triangular-ovate. Pedicel 4–8 mm. Calyx usually tinged with purplish red, 5.5–7 mm, sparsely pubescent, membranous; lobes 5, unequal, lateral lobes ± entire or 1–3-toothed. Corolla red, with dark purplish red galea; tube ca. 8.5 mm; galea bent at a right angle apically; beak horizontal, ± straight, 5.5–6.5 mm, slender; lower lip ca. 1 × 1–1.4 cm, long ciliate or
glabrous, ± erose; middle lobe hoodlike. Filaments glabrous throughout.
Forest margins; ca. 4000 m. NW Yunnan.

1a. Plants to 20 cm tall; leaf blade ovate to oblong, usually pinnatifid; lower corolla lip long ciliate
256a. subsp. debilis

1b. Plants scarcely 5–8 cm tall; leaf blade orbicular, usually pinnatifid; lower corolla lip glabrous
256b. subsp. debilior

256a. Pedicularis debilis subsp. debilis
弱小马先蒿(原亚种) ruo xiao ma xian hao (yuan ya zhong)
Plants to 20 cm tall. Leaf blade ovate to oblong, usually pinnatifid. Lower corolla lip long ciliate.
• Forest margins; ca. 4000 m. NW Yunnan.

极弱小马先蒿 ji ruo ruo xiao ma xian hao
Pedicularis liana Pennell ex H. L. Li.
Plants scarcely 5–8 cm tall. Leaf blade orbicular, usually pinnatifid. Lower corolla lip glabrous.
• NW Yunnan.

团花马先蒿 tuan hua ma xian hao
Herbs perennial, 4–10 cm, densely long pubescent. Roots fibrous. Stems 1 to several, central stem erect, outer stems usually ascending. Basal leaf petiole long, to 1 cm, sparsely pubescent; leaf blade elliptic to oblong, 1–2 cm × 5–8 mm, pinnatisect; segments 5–7 pairs, oblong, pinnatifid, dentate. Stem leaves in whorls of 3 or 4, widely spaced; leaf blade similar to basal leavess but shorter petiolar. Inflorescences compact, globose; proximal bracts strongly inflated, distal ones palmately lobed. Calyx ca. 6 mm, membranous; lobes 5, unequal, posterior one triangular-lanceolate and entire, lateral lobes leaflike and serrate. Corolla red, with dark red galea; tube erect, ca. 7.5 mm, glabrous; galea bent at a right angle apically, with an auriculate marginal protuberance on one side; beak ± bent downward, ca. 8 mm, slender; lower lip long ciliate, middle lobe hoodlike apically, ca. less than 2 x as long as lateral lobes. Anterior filaments sparsely pubescent. Fl. Jul–Aug, fr. Sep.
• Swampy meadows, grassy slopes; 3900–4800 m. E Xizang.

聚花马先蒿 ju hua ma xian hao
Herbs annual, 1–18(–25) cm tall, ± villous, not drying black. Roots woody. Stems single or numerous, ± dark purplish, sometimes branched basally, pubescent; central stem erect, outer stems procumbent to ascending. Basal leaves clustered, withering early; petiole to 3 cm. Stem leaves absent or 1 or 2(–4) pairs, opposite, ± sessile; leaf blade ovate-oblong, usually less than 3 cm, pinnatisect; segments 5–7 pairs, ovate, incised-dentate. Flowers opposite or in whorls of 4 apically; bracts ± leaffike. Pedicel short. Calyx to 6 mm, membranous, usually tinged with red, hispid; lobes 5, unequal, posterior lobe entire, lateral lobes 3-parted. Corolla rose to purplish red; tube ca. 2 × as long as calyx; galea bent at a right angle apically; beak bent slightly downward, straight, ca. 7 mm, slender; lower lip ca. as long as galea, glabrous or minutely ciliate, middle lobe hoodlike. Anterior filaments densely pubescent, other filaments sparsely pubescent or glabrous. Capsule obliquely ovoid, ca. 1/2 exceeding calyx, apiculate. Fl. Jul–Sep, fr. Aug–Oct.
Open stony pastures, grassy slopes; 2700–4900 m. SW Sichuan, S Xizang, Yunnan [Bhutan, Nepal, Sikkim].

258a. Pedicularis confertiflora subsp. confertiflora
聚花马先蒿(原亚种) ju hua ma xian hao (yuan ya zhong)
Pedicularis handel-mazzettii Bonati; P. villosula
Franchet ex F. B. Forbes & Hemsley.
Plants 5–18 cm, sometimes to 25 cm tall, ± densely villous. Stems branched basally or unbranched. Leaf blade 1–3 cm.
Open stony pastures, grassy slopes; 2700–4400 m. SW Sichuan, S Xizang, Yunnan [Bhutan, Nepal, Sikkim].

Plants 1–2(–6) cm tall, glabrescent throughout. Stems usually unbranched. Leaf blade scarcely 5–6 mm.
• 3800–4900 m. NW Yunnan.

纤茎马先蒿 xian jing ma xian hao
Herbs 5–30 cm tall, glabrous. Roots fibrous or fusiform, fleshy. Stems clustered, unbranched, slender, flexuous. Basal leaves cespitose, petiole to 8 cm. Stem leaves opposite; petiole 2–4 cm; leaf blade ovate-oblong, 2–3 × ca. 1 cm, pinnatisect; segments 6–8 pairs, ovate-lanceolate, pinnatifid, dentate. Flowers axillary. Pedicel 4–6 mm. Calyx campanulate, glabrous, 1/3 eleft anteriorly, ca. 7.5 × 3 mm; lobes 5, entire, posterior one subulate, lateral lobes lanceolate or ovate. Corolla tube slightly longer than calyx, 8–9 mm; galea bent at a right angle apically. Anterior filaments densely pubescent, other filaments sparsely pubescent or glabrous. Capsule obliquely ovoid, ca. 1/2 exceeding calyx, apiculate. Fl. Jul–Sep, fr. Aug–Oct.
Open stony pastures, grassy slopes; 3900–4800 m. NW Sichuan, S Xizang, Yunnan [Bhutan, Nepal, Sikkim].

259a. Pedicularis tenuicaulis subsp. tenuicaulis
纤茎马先蒿(原亚种) xian jing ma xian hao (yuan ya zhong)
Pedicularis tenuicaulis var. tenuicaulis
Plants 1–4 cm tall, glabrescent throughout. Stems usually unbranched. Leaf blade scarcely 5–6 mm.
• 3800–4900 m. NW Yunnan.
angle apically; beak bent ± downward, straight, to 5 mm, slender; lower lip ca. 1.1 cm wide, glabrous, lobes rounded, middle one ca. 1/2 as long as lateral pair, not hoodlike. Anterior filament pair long pubescent. Capsule lanceolate, 1–1.3 cm × ca. 4 mm, apex acute. Seeds ovoid, ca. 1.5 × 0.75 mm. Fl. Jul–Aug, fr. Aug–Sep.

About 4000 m. S Xizang [Bhutan, Nepal, Sikkim].


**费尔氏马先蒿** (*fei er shi ma xian hao*)

Herbs annual, 5–20 cm tall. Stems single, erect, densely long pubescent. Leaves opposite or whorled; proximal ones long petiolate and distal ones sessile, ciliate; leaf blade lanceolate to linear-lanceolate, 1–2 cm, glabrous or glabrescent, pinnatifid to pinnatisect; segments 7–20 pairs, rounded, margin entire. Inflorescences spicate, few flowered, interrupted basally; bracts palmatilobate, ciliate. Proximal pedicels ca. 2 mm, distal flowers sessile. Calyx ovate-cylindric, ca. 7 mm; lobes 5, unequal, posterior one subulate, very small, lateral lobes ± narrowly ovate, whitish long pubescent, serratate. Corolla red-purple, with dark purple galea; tube ca. as long as galea, ca. 5–7 × 4–10 mm, middle lobe broadly triangular-ovate, much projecting, slightly hoodlike apically. Filaments glabrous throughout. Fl. Jul–Aug.

- Alpine or swampy meadows, damp soil by stream and gully margins, *Picea* woodlands. NE Qinghai, W Sichuan.

1a. Plants 10–20 cm tall; leaf segments 16–20 pairs; lower corolla lip ca. 5 × 4 mm

................................. 260a. subsp. *pheulpinii*

1b. Plants 5–15 cm tall; leaf segments 7–14 pairs; lower corolla lip ca. 7 × 10 mm

................................. 260b. subsp. *chilienensis*

260a. *Pedicularis pheulpinii* subsp. *pheulpinii*

**费尔氏马先蒿(原亚种)** (*fei er shi ma xian hao* (yuan ya zhong))

Plants 10–20 cm tall. Leaf segments 16–20 pairs. Lower corolla lip ca. 5 × 4 mm.

- W Sichuan.


**祁连费尔氏马先蒿** (*qi lian fei er shi ma xian hao*)

Plants 5–15 cm tall. Leaf segments 7–14 pairs. Lower corolla lip ca. 7 mm × 1 cm. Fl. Jul–Aug.

- Alpine or swampy meadows, damp soil by stream and gully margins, *Picea* woodlands. NE Qinghai.


**马克逊马先蒿** (*ma ke xun ma xian hao*)

*Pedicularis sabaensis* Bonati; *P. trigonophylla* Handel-Mazzetti.
brous, middle lobe oblong, ca. 3.5 mm. Filaments glabrous throughout. Fl. Jul, fr. Aug.
Alpine meadows, pastures; ca. 3300 m. SE Xizang [Myanmar].

春丕马先蒿  chun pi ma xian hao
Herbs perennial, 4–6 cm tall, glabrous. Roots fascicled, fusiform, fibrous. Stems numerous, cespitose, slender. Basal leaves in a dense rosette; petiole to 1.5 cm. Stem leaves only 1 pair or absent, petiole ca. 5 mm; leaf blade ca. 1 cm × 3.5 mm, pinnatisect; segments 8–10 pairs, ovate, dentate. Inflorescence few flowered; flowers fascicled; bracts leafflike. Pedicel 4–6 mm.
Calyx cylindric-campanulate, ca. 3 × 3 mm, 1/3 cleft anteriorly, glabrous; lobes 5, unequal, posterior one linear and entire, lateral lobes lanceolate, serrate. Corolla tube ca. 4 as long as calyx; galea falcate; beak bent downward, ca. 6.5 mm, slender; lower lip ca. 1.4 cm wide, lobes rounded, middle lobe slightly smaller than lateral pair. Filaments glabrous throughout.

S Xizang [Sikkim].

全叶系 quan ye xi

全叶马先蒿 quan ye ma xian hao
Herbs perennial, 4–7 cm tall, drying black. Roots fusiform, fleshy. Stems 1 to several, ascending. Basal leaves in a rosette; petiole 3–5 cm; leaf blade narrowly lanceolate to linear-lanceolate, 3–5 cm × ca. 5 mm. Stem leaves 2–4 pairs, sessile, narrowly oblong, 1.3–1.5 cm × 7.5–10 mm, ± entire to crenate or serrate. Inflorescences spicate, 1–3-fascicled, sometimes interrupted basally; bracts leafflike, longer than or ca. as long as calyx. Calyx cylindric-campanulate, ca. 1.2 cm, glandular pubescent, 1/3 cleft anteriorly; lobes 5, unequal, posterior one smallest, lateral lobes oblong, crenate. Corolla dark purple; tube erect, ca. 2 cm, slender; galea bent at a right angle apically; beak S-shaped, ca. 1.5 cm, slender; lower lip ca. 1.8 cm wide, glabrous, middle lobe rounded, ca. 1/2 as long as lateral pair. Filaments pubescent throughout. Capsule enclosed by persistent calyx, compressed, ovoid, ca. 1.5 cm × 7 mm. Fl. Jun–Jul, fr. Jul–Sep.

1a. Plants relatively low; leaves crenate ........................................................... 265a. subsp. integrifolia
1b. Plants to 7 cm; leaves serrulate to ± entire ........................................... 265b. subsp. integerrima

265a. Pedicularis integrifolia subsp. integrifolia 全叶马先蒿(原亚种) quan ye ma xian hao (yuan ya zhong)
Plants low. Leaf blade narrowly oblong, crenate.
• Alpine rocky meadows, Picea forests; 2700–5100 m. W Qinghai, SW and W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

全缘全叶马先蒿 全缘全叶马先蒿 quan yuan quan ye ma xian hao
• Picea forests, alpine meadows; 2700–4200 m. SW and W Sichuan, SE Xizang, NW Yunnan.

绵穗系 mian sui xi
Leaves opposite or in whorls of 3 or 4. Basal leaves numerous, persistent, long petiolate, lanceolate, pinnatifid to pinnatisect. Inflorescences tomentose. Calyx 5-lobed. Corolla tube deciduous apically; galea without marginal teeth near apex, beakless.
• Two species: endemic to China.

1a. Plants 12–20 cm tall; stem leaves opposite or in whorls of 3, ± sessile; flowers compactly arranged in a densely whitish tomentose spike; calyx lobes short ......................................................... 266. P. pilostachya
1b. Plants often 30–50 cm tall; stem leaves in whorls of 3 or 4, petiole 1–1.6 cm; flowers ± laxly arranged, grayish tomentose; calyx lobes longer ........................................................................................................ 267. P. ternata

绵穗马先蒿 mian sui ma xian hao
Herbs perennial, cespitose, 12–20 cm tall, pubescent. Rootstock fleshy. Basal leaves in a rosette; petiole 1–4 cm; leaf blade lanceolate-oblong, abaxially tomentose,
pinnatifid; segments to 15 pairs, pinnatifid, serrulate. Stem leaves in only 2 whorls, proximal ones opposite, distal ones in whorls of 3, ± sessile. Inflorescences spicate, compactly arranged, with dense whitish tomentum, ca. 15-flowered; bracts ovate or lanceolate, distal ones smaller, abaxially densely tomentose. Calyx 1.1–1.7 cm, densely whitish tomentose; lobes 5, unequal, short, entire, triangular. Corolla deep carmine; tube slightly longer than calyx, straight in calyx, bent at a right angle apically; galea rounded, truncate at apex; lower lip ca. as long as galea. Filaments glabrous. Fl. Jun–Jul, fr. Jul–Aug.

- Gravelly slopes on mountain summits; 4700–5100 m. W Gansu, E Qinghai.


Herbs perennial, 30–50 cm tall, pubescent, drying ± black. Rootstock stout, fleshy. Stems often several, erect or ± curved. Basal leaves in a rosette; petiole to 7 cm, glabrous; leaf blade ± lanceolate, to 9 cm, glabrous on both surfaces, pinnatifid to pinnatisect; segments to 14 pairs, incised-dentate. Stem leaves in 2 or 3 or 4 whorls, smaller than basal leaves; petiole 1–1.6 cm. Flowers laxly arranged in spikes, only 1–3 whorls, grayish tomentose; bracts leaflike, proximal ones longer than flowers, sparsely pubescent. Calyx arachnoid; lobes 5, unequal, posterior lobe smallest, all oblong-triangular, entire. Corolla violet, small; tube ca. as long as calyx lobes; galea truncate at apex; lower lip ca. as long as galea. Filaments glabrous. Capsule compressed, ovoid, to 2 × 1 cm, apex acute. Seeds to 3.5 mm. Fl. Jul, fr. Jul–Aug.

- Thickets; 3200–4600 m. W Gansu, Nei Mongol, Qinghai.


颤喙系 chan hui xi

Herbs low. Stems single or numerous, unbranched. Basal leaves persistent, long petiolate, ± lanceolate or narrowly oblong, large, pinnatifid, with many segments. Stem leaves in whorls of 3. Inflorescences spicate. Corolla tube erect, ca. as long as calyx; beak of galea long, horizontal or slightly decurved.

- One species: endemic to China.


颤喙马先蒿 chan hui ma xian hao

Herbs annual, 4–15 cm tall. Stems numerous, erect or flexuous, unbranched, pubescent. Basal leaf petiole 2–5 cm, pubescent; leaf blade lanceolate, 3–5 × 1–1.4 cm, fleshy, pinnatifid; segments 15–20 pairs, ovate, pinnatifid, dentate. Stem leaves only in 1 or 2 whorls, similar to basal leaves but smaller. Inflorescences spicate, interrupted basally, flowers in whorls of 3; bracts leaflike, longer than calyx. Calyx ca. 1 cm, slightly cleft anteriorly, pubescent; lobes 5, unequal, ca. as long as tube, posterior lobe smallest, posterior-lateral pair largest. Corolla purple; tube ca. 1 cm, glabrous; galea ± bent at a right angle, 5–6 mm, crested; beak horizontal or slightly decurved, 4–6 mm, slender; lower lip 7–8 mm, minutely ciliate. Filaments glabrous. Capsule cylindric, ca. 1 cm. Fl. Jun–Jul, fr. Jul–Aug.

- Shaded areas, valleys; 3000–4000 m. ?SE Xizang, NW Yunnan.


翘喙系 qiao hui xi

Stems single. Basal leaves numerous, long petiolate, often lanceolate. Stem leaves few, opposite or in whorls of 4. Inflorescences long spicate, interrupted. Corolla tube bent at a right angle apically, ca. 1.5 × as long as calyx; galea often twisted; beak S-shaped, long.

- One species: endemic to China.


翘喙马先蒿 qiao hui ma xian hao

Herbs perennial, to 40 cm tall, drying ± black. Roots fleshy. Stems erect, unbranched, sparsely pubescent. Basal leaf petiole 7–9 cm, glabrescent; leaf blade linear-oblong to linear-lanceolate, 8–12 × 1.5–2.2 cm, abaxially sparsely pubescent along veins, adaxially sparsely pubescent, pinnatifid to pinnatisect; segments 18–22 pairs, ovate-oblong to ovate-lanceolate, pinnatifid, margin double dentate. Stem leaves few, similar to basal leaves but smaller and shorter petiolate. Inflorescences 15–20 cm; bracts 1–1.5 cm × ca. 6 mm, sparsely pubescent. Flowers in whorls of 4. Calyx cylindric, ca. 1.2 cm, 1/3 cleft anteriorly; lobes 5, unequal, posterior lobe smallest, glabrescent or pubescent along veins, serratate. Corolla purplish red, glandular pubescent; tube ca. 1.8 cm, bent at a right angle apically; galea often twisted; beak to 1.5 cm, slender, S-shaped; lower lip shorter than galea, middle lobe prominent. Filaments villous. Fl. Jul–Aug, fr. Sep.

- Alpine meadows; 4000–4200 m. NW Yunnan.

Herbs low. Stems often several, ascending or diffuse, usually weak. Basal leaves persistent, often oblong. Stem leaves often opposite. Inflorescences often few flowered. Calyx lobes leaflike, serrate. Corolla tube decurved apically; galea with 1 marginal tooth on each side, beakless; lower lip spreading.

- Two species: endemic to China.

1a. Corolla tube sparsely pubescent; leaves large, petiole of basal leaves to 4 cm, leaf blade to 3 × 1.6 cm;
   corolla ca. 2.5 cm ................................................................. 270. *P. sherriffii*

1b. Corolla tube densely long white pubescent; leaves smaller, petiole of basal leaves to 2.3 cm, leaf blade ca. 12 × 8 mm; corolla ca. 1.9 cm ............................................. 271. *P. atroviridis*


- Open earthy slopes; 4100–4300 m. SE Xizang.


- Open moss-covered slopes; ca. 4100 m. SE Xizang.


Herbs low. Stems often several, ascending or procumbent, unbranched. Leaves mostly basal, long petiolate, small, rounded. Stem leaves opposite. Corolla tube ca. 2 × as long as calyx; galea marginally 2-toothed; beak slender.

- One species: endemic to China.


- Grassy slopes in alpine regions; 3700–4200 m. NW Yunnan.

Stems often several, herbaceous, weak, ascending. Leaves opposite or in whorls of 4, pinnatisect. Calyx lobes shorter than calyx tube. Corolla tube 2–2.5 x as long as calyx; galea without marginal teeth; beak ± straight.

- Two species: endemic to China.
  1a. Corolla tube 7–8 mm; lower lip ciliate, middle lobe ± hoodlike at apex; filaments glabrous ...
  1b. Corolla tube to 25 mm; lower lip not ciliate, middle lobe rounded, not hoodlike; filaments 2 pubescent, 2 glabrous


阿墩子马先蒿 a dun zi ma xian hao
Herbs perennial, 10–20 cm tall, drying black. Roots fibrous, fascicled. Stems glabrescent. Leaves in whorls of 4 or sometimes proximal ones opposite, petiolate or distal ones ± sessile; petiole 2.5–4.5 cm; leaf blade ovate-oblong or ovate, 1.5–2.5 cm, pinnatisect; segments 9–13 pairs, ovate, pinnatifid, incised-dentate. Flowers in whorls of 4; bracts leaflike basally. Pedicel ca. 2 mm. Calyx tube ca. 3.5 mm, membranous; lobes 5, unequal, posterior one entire, lateral lobes larger, serrate. Corolla purple; tube erect, 7–8 mm; galea strongly bent apically; beak horizontal, ± straight, ca. 5 mm, slender; lower lip ca. 7 × 9 mm, ciliate, middle lobe smaller than lateral pair. Filaments glabrous. Fl. Jul, fr. Aug.


爱氏马先蒿 ai shi ma xian hao
Herbs perennial, less than 15 cm tall, drying black. Roots few, fascicled, ± fleshy. Stems many branched; branches diffuse basally. Leaves opposite; petiole to 4.5 cm; leaf blade linear-oblong to elliptic-oblong, to 5 × 2 cm, pinnatisect; segments 2–4 pairs, pinnatisect, dentate. Flowers axillary. Pedicel ca. 8 mm, sparsely long pubescent. Calyx ca. 1 cm, slightly cleft anteriorly; lobes 5, unequal, posterior tooth linear and entire, lateral lobes larger, ovate, serrate. Corolla light purple with whitish purple tube; tube to 2.5 cm, slender, glabrous; galea bent at a right angle apically; beak straight, ca. 3.5 mm; lower lip not ciliate, middle lobe rounded, not hoodlike. Filaments 2 pubescent, 2 glabrous. Fl. Jun.

4300–4500 m. W Sichuan, SE Xizang.


铺地系 pu di xi
Plants less than 10 cm tall. Stems low, cespitose. Leaves mostly basal; petiole 3–4 x as long as leaf blade; leaf blade oblong to ovate, pinnatifid. Flowers few. Galea with 2 marginal teeth near apex, beakless.

Two species: Bhutan, China, Nepal, Sikkim; one species in China.


皮氏马先蒿 pi shi ma xian hao
Herbs low, 2–4 cm tall, not drying black. Stems glabrous. Leaves mostly basal; petiole to more than 2 cm; leaf blade ovate-elliptic, less than 1 cm, sparsely pubescent; segments 3–5 pairs, crenate. Stem leaves often only 1 pair, shorter petiolate. Flowers axillary, few. Pedicel to 6 mm, glabrous. Calyx ca. 8 mm, membranous, sparsely pubescent along midvein; lobes 5, unequal, ± leaflike. Corolla rose, 2.5–3 cm, glabrous; tube slightly bent at middle, ca. 1.5 cm, slightly expanded apically; galea slightly falcate, ca. 1.1 cm, apex truncate; lower lip large, slightly longer than galea. Filaments glabrous.

- Alpine regions. W Sichuan, SE Xizang.


假铁角蕨叶系 jia tie jiao jue ye xi

Ser. Pseudorostratae H. Limpricht.

Herbs low. Stems unbranched. Leaves mostly basal, in a rosette, long petiolate; leaf blades lanceolate, pinnatifid or pinnatisect. Stem leaves few or absent. Inflorescences short, few flowered. Calyx lobes 5, unequal, serrate. Corolla tube longer than calyx but less than 2 x as long; galea with 1 auricle on each margin; beak straight, erose-denticulate at apex.

One species: Bhutan, China, E Nepal, Sikkim.

俯垂马先蒿 lie hui ma xian hao
Herbs perennial, 3–5 cm tall, glabrous, drying black or not. Stems numerous, slender, soft. Leaves mostly basal; petiole to 2 cm; leaf blade ca. 9 × 3–4 mm, pinnatifid; segments 6–8 pairs, ovate, dentate. Stem leaves few or absent, long petiolate. Inflorescences racemose, 3- or 4-flowered; bracts leaflike. Pedicel 2–3 mm. Calyx oblong, ca. 9 mm, slightly cleft anteriorly, pubescent along veins; lobes 5, unequal, serrate. Corolla tube 1.6–1.8 cm; galea falcate, ca. 1.5 cm, dilated; beak straight, ca. 3 mm, apex truncate; lower lip slightly longer than galea, ciliate. Filaments 2 long pubescent, 2 glabrous. Capsule ovoid, ca. 1.1 cm × 6 mm, slightly exceeding calyx, short apiculate. Fl. Aug–Sep, fr. Sep.

Humus-clad boulders of forest understories, open hillsides; ca. 3800 m. S Xizang [Blutan, E Nepal, Sikkim].


俯垂系 fu chui xi
Herbs low, usually more than 10 cm tall. Stems unbranched, robust, often several. Leaves mostly basal, long petiolate. Stem leaves few, opposite, ± elliptic, pinnatifid to pinnatisect. Inflorescences short racemose. Calyx unequally 5-lobed. Corolla tube slightly longer than calyx; galea falcate, with or without marginal protuberances. Three species: Bhutan, China; two species in China.

1a. Calyx lobes unequal, posterior one entire, lateral lobes serrate; galea with 1 distinct marginal protuberance on each side; lower corolla lip sinuate-crenulate .......................................................... 277. P. cernua

1b. Calyx lobes unequal, but all serrate; galea without marginal protuberance on each side, but apex denticulate; lower corolla lip not sinuate-crenulate ................................................................................... 278. P. gongshanensis


俯垂马先蒿 fu chui ma xian hao
Herbs perennial, 4.5–22 cm tall, glabrous, drying black. Stems fleshy, unbranched. Basal leaves in a rosette; petiole 3–12 cm, slender, glabrous; leaf blade ovate-oblong, 4–5.5 × 2–4.5 cm, pinnatisect to pinnatifid; segments 5–9 pairs, linear-lanceolate to oblong-lanceolate, pinnatifid, serrulate. Stem leaves opposite, shorter petiolate, pinnatifid. Inflorescences centrifugal, 4–7 cm, many flowered; bracts leaflike, shorter than flowers. Calyx ca. 1 cm, slightly cleft anteriorly; lobes 5, unequal, posterior one linear, entire, lateral lobes larger, serrate. Corolla red; tube slightly longer than calyx, ca. 1.3 cm; galea erect basally, with a central marginal protuberance on each side, apex truncate, 1-toothed on each side, these sometimes inconspicuous; lower lip to 1.4 cm, ciliate, sinuate-crenulate, middle lobe smallest. Filaments villous. Capsule long ovoid, 1.2–1.5 cm × 5–7 mm, oblique, short apiculate. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine meadows; 3800–4000 m. SW Sichuan, NW Yunnan.
- Alpine grasslands; ca. 4200 m. Yunnan (upper Kiuksiang Valley).

277a. Pedicularis cernua subsp. cernua

俯垂马先蒿(原亚种) fu chui ma xian hao (yuan ya zhong)

Leaves ovate-oblong, 4–5.5 × 2–4.5 cm, pinnatisect to pinnatifid; segments 5–9 pairs, linear-lanceolate to oblong-lanceolate, pinnatifid, serrulate. Galea with distinct teeth. Fl. Jul–Aug.

- Alpine meadows; 3800–4000 m. SW Sichuan, NW Yunnan.


宽叶俯垂马先蒿 kuan ye fu chui ma xian hao

Leaves broadly ovate, 3–4 × 2.5–3.5 cm, pinnatifid; segments 3–5 pairs, ovate, sinuate-dentate. Galea with inconspicuous teeth. Fl. Aug.

- Alpine grasslands; ca. 4200 m. Yunnan (upper Kiuksiang Valley).


贡山马先蒿 gong shan ma xian hao
Herbs perennial, to 30 cm tall, drying ± black. Stems clustered, basally with remnants of previous year’s stems and scales. Basal leaf petiole to 10 cm, sparsely pubescent; leaf blade oblong, 4–8 cm, pinnatisect; segments 7–12 pairs, oblong, sparsely pubescent on both surfaces, dentate. Stem leaves few, opposite or in whorls of 4, smaller than basal leaves. Inflorescences 16–24-flowered; bracts leaflike. Pedicel ca. 3 mm, slender. Calyx ca. 1.5 cm, 1/3 cleft anteriorly, sparsely whitish pubescent; lobes 5, unequal, serrate. Corolla red, 3–4 cm; tube ca. 1.5 cm, glabrous; galea without marginal protuberance, but subapically toothed; lower lip shorter than galea, 1–1.2 cm, ciliate, entire. Filaments pubescent. Capsule ovoid-oblong, slightly compressed, 1.5–2 cm, mucronate. Fl. Jul–Jun, fr. Jun–Aug.

- Shrubby grass of hillsides; ca. 3600 m. NW Yunnan (Gongshan).
Herbs low. Stems often single or 2 or 3, unbranched. Leaves in whorls of 3 or opposite, small. Stem leaves in 1 or 2 whorls, sometimes opposite. Inflorescences short, often capitate. Calyx 5-lobed. Corolla tube erect, slightly longer than calyx; galea resembling goose head, short beaked.

- Two species: endemic to China.

1a. Corolla ca. 2.8 cm; beak of galea scarcely 1.5 mm ............................... 279.  
1b. Corolla ca. 2.5 cm; beak of galea ca. 2.5 mm ........................................... 280.

鹅首马先蒿  
e shou ma xian hao  
Herbs perennial, 7–13 cm tall, not drying black. Roots sparsely fascicled, ± fleshy. Stems pubescent or glabrescent. Leaves opposite or whorled; petiole to 5 cm basally, glabrous; leaf blade linear-oblong, to 3 cm × 8 mm, pinnatisect; segments 4–10 pairs, ovate-oblong, pinnatifid, dentate. Inflorescences capitate, 3–4 cm; bracts leaflike. Pedicel to 6 mm wide, long ciliate, sparsely pubescent. Calyx to 9 mm, membranous, without reticulate veins; lobes 5, unequal, serrate. Corolla rose, ca. 2.8 cm; tube nearly straight, ca. 1 cm; galea falcate apically, longer than tube; beak scarcely 1.5 mm; lower lip ca. as long as galea, lobes slightly acute at apex, ciliate, praemorse. Filaments 2 sparsely pubescent, 2 glabrous. Fl. Jul, fr. Aug.  
- Swampy alpine meadows; 3600–4300 m. SW Gansu, N Sichuan.

280. **Pedicularis tatsienensis** Bureau & Franchet, J. Bot. (Morot) 5: 108. 1891.  
打箭马先蒿  
da jian ma xian hao  
Herbs perennial, 10–27 cm tall, glabrescent, not drying black. Stems purplish black, shiny, erect or ± bent, with 1–3 internodes. Leaves mostly basal, in a rosette; petiole 2.5–7 cm, slender; leaf blade ovate-oblong to linear-oblong, to 3 × 1.4 cm, pinnatisect; segments 2–4 pairs, ovate to oblong, pinnatifidpartite, margin double dentate. Stem leaves smaller than basal leaves, shorter petiolate; leaf blade 5–10 mm. Inflorescences capitate, 2–3.5 cm, many flowered; bracts leaflike. Calyx tube 6–7 mm; lobes 5, unequal. Corolla purplish red, with nearly blackish purple galea, ca. 2.5 cm; tube ca. 1.2 cm; galea falcate apically; beak straight, ca. 2.5 mm, slender; lower lip ca. 1 cm × 3.5 mm, slightly shorter than galea. 2 filaments sparsely long pubescent, 2 glabrous. Fl. May–Jun, fr. Jul–Aug.  
- Alpine meadows; 4100–4400 m. W Sichuan, NW Yunnan.
Herbs low, ± stemless. Leaves alternate, mostly basal, in a rosette, old withered leaf bases persistent. Inflorescences short spicate or capitulate, few flowered. Calyx 5-lobed. Corolla large; tube erect; galea with 1 marginal tooth on each side, with a beaklike apex.

Two species: Bhutan, China, SW Asia; one species in China.

282. Pedicularis merrilliana  

迈氏马先蒿 mai shi ma xian hao
Herbs perennial ca. 4(–8) cm tall, drying black. Roots ± fleshy. Stems 1–5, unbranched, shiny, with membranous scales at base. Leaves mostly basal; petiole 1.5–3 cm, slender, glabrescent; leaf blade oblong, 1–1.7 cm × 3–5 mm, abaxially rust colored pubescent, adaxially glabrous, pinnatisect; segments 8–12 pairs, oblong to ovate-oblong, dentate. Inflorescences ca. 3-flowered; bracts leaflike, 0.8–1.5 cm. Pedicel 2–4(–7) mm, slender, sparsely villous. Calyx ca. 1 cm × 2.5–3 mm, slightly cleft anteriorly, pubescent; lobes 5, unequal, serrate. Corolla purple-red, ca. 2.3 cm; tube ± erect, 1–1.2 cm; galea slightly falcate, with a short, wide beaklike apex, truncate, with 1 distinct subapical, marginal tooth on each side; lower lip ca. 7 mm, glabrous. Filaments glabrous. Capsule oblong-ovoid, 1.1–1.3 cm, slightly oblique, apex acute. Fl. Jun–Jul, fr. Jul–Aug.

Alpine meadows; 3200–4900 m. SW Gansu, NW Sichuan [?Bhutan].

93. Ser. Asplenifoliae


铁角蕨叶系 tie jiao jue ye xi
Herbs low, without a distinct main stem. Leaves alternate, numerous, almost all basal, persistent. Inflorescences short spicate or subcapitate, few flowered, long pedicellate. Calyx 5-lobed. Corolla tube less than 2 × as long as calyx; beak straight or slightly downward.

About seven species: Bhutan, China, Europe, Nepal, North America, Sikkim; three species in China.

1a. Stems glabrescent; leaf segments 4 or 5 pairs; corolla 1.8–2 cm, tube ca. 2 × as long as calyx .......... 285. P. yui
1b. Stems with lines of rust colored hairs; leaf segments 5–12 pairs; corolla 1.2–1.8 cm, tube slightly longer than calyx.

2a. Corolla 1.5–1.8 cm, lower lip glabrous; all filaments glabrous ................................................. 283. P. mayana
2b. Corolla 1.2–1.5 cm, lower lip long ciliate; filaments 2 sparsely pubescent, 2 glabrous ...... 284. P. tenacifolia


迈亚马先蒿 mai ya ma xian hao
Herbs perennial, 4–9 cm tall, marcescent leaves with petioles and scales persistent at base, drying black. Stems usually 3–7, erect or ascending, slender, with lines of rust colored hairs. Leaves alternate; basal leaves in a rosette; petiole 4–5 cm, slender, sparsely villous; leaf blade ovate-lanceolate to ovate-oblong, 0.8–1.5 cm × 4–5 mm, abaxially sparsely pubescent, scurfy, adaxially glabrous, pinnatisect; segments 6–12 pairs, lanceolate, crenate. Inflorescences subcapitate, usually 4–8-flowered; bracts leaflike. Calyx 7–9 mm, slightly cleft anteriorly, rust colored villous; lobes 5, unequal, ob lanceolate, crenate. Corolla purple, 1.5–1.8 cm; tube erect. 0.9–1.2 cm, glabrous; galea falcate apically, usually slightly crested; beak 3–4 mm, slender, lower lip 6–9 mm, distinctly praemorse, glabrous. Filaments glabrous. Capsule lanceolate-oblong, 1.3–1.4 cm × ca. 5 mm, slightly oblique, apex acute. Fl. May–Aug, fr. Aug–Sep.

• Alpine meadows; 4500–4900 m. SE Xizang.

285. Pedicularis yui  

季川马先蒿 ji chuan ma xian hao
Herbs perennial, 5–7 cm tall, marcescent stems and leaves of preceding year persistent at base, drying black. Stems 3–5, unbranched, stout, sparsely pubescent, with densely rust colored villous lines. Leaves mostly basal; petiole 2–3 cm, margin densely villous; leaf blade ovate-oblong or long ovate, 1–1.5 cm × 5–6 mm, sparsely rust colored pubescent on both surfaces, pinnatisect; segments 5 or 6 pairs, broadly ovate, minutely crenulate. Inflorescences subcapitate, 3–5-flowered; bracts ca. as long as calyx. Pedicel 2–3 cm, pubescent. Calyx ca. 7 mm, slightly cleft anteriorly, long pubescent; lobes 5, unequal. Corolla purple-red, 1.2–1.5 cm; tube erect, slightly exceeding calyx; galea ± falcate apically; beak bent slightly downward, straight, ca. 5 mm; lower lip ca. 1 cm, long ciliate. 2 filaments sparsely pubescent, 2 glabrous. Fl. Jun–Aug, fr. Aug–Sep.

• Alpine meadows; 3700–4600 m. SW Gansu, NW Sichuan [?Bhutan].

宿叶马先蒿 su ye ma xian hao
Herbs 6–7 cm tall, glabrescent, drying black. Stems usually single, erect, unbranched, slender, marcescent leaves and petioles of preceding year and lanceolate scales persistent at base. Leaves alternate, mostly basal; petiole 1.5–3 cm; leaf blade long ovate to ovate-oblong, 5–10 × 3–5 mm, abaxially usually white villous along
midvein, adaxially glabrous, pinnatisect; segments 4 or 5 pairs, short ovate, minutely crenulate. Inflorescences racemose or subcapitate, 4–6-flowered; bracts leaflike. Pedicel 3–6(–11) mm, filiform. Calyx 8–10 mm, sparsely long pubescent or glabrous, slightly cleft anteriorly; lobes 5, unequal, ovate, serrate. Corolla purple, 1.8–2 cm; tube erect, ca. 2 × longer than calyx; galea bent at a right angle apically; beak bent slightly downward, straight, 4–5 mm; lower lip ca. 1.1 cm, glabrous or ciliate, minutely crenulate. Filaments glabrous or 2 pubescent. Fl. Jun–Jul, fr. Jul.

- Alpine swamps; ca. 4100 m. NW Yunnan.

1a. Lower corolla lip not ciliate; all filaments glabrous ........................................ 285a. Pedicularis yui var. yui

1b. Lower corolla lip ciliate; filaments 2 pubescent, 2 glabrous .................................... 285b. Pedicularis yui var. ciliata

285a. Pedicularis yui var. yui

季川马先蒿 (原变种) ji chuan ma xian hao (yuan bian zhong)

Lower corolla lip not ciliate. Filaments glabrous.
- Alpine swamps; ca. 4100 m. NW Yunnan.


缘毛季川马先蒿 yuan mao ji chuan ma xian hao

Lower corolla lip ciliate. Filaments 2 pubescent, 2 glabrous.
- Alpine swamps; ca. 4100 m. NW Yunnan.


具齿系 ju chi xi

Herbs perennial, low. Leaves few, alternate, pinnatifid or pinnatisect. Flowers few, axillary. Calyx 5-lobed.

One species: China, Sikkim.


具齿马先蒿 ju chi ma xian hao

Herbs 2.5–6 cm tall. Rhizomes creeping, 5–7 cm. Stems minutely pubescent. Basal leaves withering early; petiole 2.5–3 cm. Stem leaf petiole 5–10 mm; leaf blade ovate, 2–3 × 2.5 cm, pinnatifid or pinnatisect; segments 3–5 pairs, pinnatifid, dentate. Flowers axillary. Pedicel 2–4 mm. Calyx cylindric-campanulate, ca. 7 mm, slightly cleft anteriorly; lobes 5, unequal, entire. Corolla tube ca. 1.3 cm, slightly expanded apically; galea falcate, ca. 1 cm, with 1 pair of triangular marginal teeth; beak straight, ca. 3.5 mm, slender; lower lip ca. 1.1 cm, wide, lobes ovate, middle lobe ca. 1/2 as long as lateral lobes. Filaments pubescent, anterior filaments more densely so.

S Xizang [Sikkim].


少叶系 shao ye xi

Herbs low to moderately tall, without a distinct main stem. Roots numerous. Stems rigid, mostly unbranched. Leaves basal or basal and on stem, persistent, alternate, pinnatifid to pinnatisect. Inflorescences short racemose or capitulate; bracts petiolate. Calyx slightly cleft anteriorly or not, 5-lobed. Corolla tube ca. as long as or longer than calyx; beak slender.

- Six species: endemic to China.

1a. Leaves almost all basal; leaf blade pinnatifid to pinnatisect.

2a. Corolla tube ca. 12 mm; filaments glabrous; plants 9–22 cm tall ................................. 290. P. tsarungensis

2b. Corolla tube 8–9 mm; filaments pubescent; plants to 4–13(–19) cm tall.

3a. Leaf blade ovate-elliptic to oblong-lanceolate, 1.5–2.2 cm, segments 5–7 pairs; 2 filaments pubescent, 2 glabrous; lower corolla lip ca. 10 × 8 mm......................................................... 287. P. umbelliformis

3b. Leaf blade lanceolate to linear-lanceolate, 1–6 cm, segments 7–14 pairs; filaments densely pubescent; lower corolla lip 8–10 × 12–15 mm ................................................................. 289. P. praeruptorum

1b. Leaves basal and on stem; leaf blade pinnatifid to pinnatisect.

4a. Flowers axillary, lax or in a lax raceme to 20 cm; calyx lobes equal, flabellate, all dentate 292. P. forrestiana

4b. Inflorescences short racemose; calyx lobes unequal, neither flabellate nor all dentate.

5a. Leaf blade pinnatifid; calyx 1/3 cleft anteriorly; roots fusiform ................................. 288. P. yunnanensis

5b. Leaf blade pinnatifid; calyx slightly cleft anteriorly; roots filiform ............................. 291. P. micrantha


伞花马先蒿 san hua ma xian hao

Herbs perennial, 6–13 cm tall, ± drying black. Roots linear. Stems 2 or 3(–6), unbranched, minutely pubescent.
Herbs perennial, to 25 cm tall, not drying black. Roots fascicled, fusiform. Stems erect, glabrous. Leaves mostly basal, petiole 4–7 cm, glabrous; leaf blade ovate-oblong to oblong-lanceolate, 2–4.5 cm, abaxially sparsely pubescent along veins, adaxially glabrous, pinnatifid; segments 5–12 pairs, triangular-ovate to ovate-oblong, pinnatifid or incised-dentate. Inflorescences short racemose; bracts leaflike, proximal ones longer than flowers. Pedicel 5–10 mm. Calyx 7–8 mm, 1/3 cleft anteriorly; tube ca. 5 mm; lobes 5, unequal, posterior one smallest, entire, others serrate. Corolla red, 1.8–2 cm; tube slightly longer than calyx, expanded apically; beak slightly downward, 4–5 mm; lower lip ca. 1.2 cm; galea ± bent at a right angle; beak straight or slightly downward, 4–5 mm; lower lip ca. as long as galea, sparsely ciliate, lobes ± equal, rounded. Filaments glabrous. Fl. May–Jun, fr. Jul–Aug.

288. Pedicularis yunnanensis

Herbs perennial, ca. 100 m. SE Yunnan.

289. Pedicularis praeruptorum

Herbs perennial, (4–)10–19 cm tall, drying black. Roots fascicled, fusiform. Stems erect, densely glandular pubescent. Leaves almost all basal; petiole 1–6.5 cm; leaf blade lanceolate to linear-lanceolate, 1–6 cm, abaxially white pubescent along veins, adaxially glabrous, pinnatifid to pinnatisect; segments 7–14 pairs, ovate to lanceolate, pinnatifid or double dentate. Inflorescences short racemose; bracts leaflike. Pedicel 2–6 mm, densely pubescent. Calyx to 8 mm, 1/3–1/2 cleft anteriorly, with long hairs along midvein; lobes 5, unequal, posterior lobe smallest, ± entire, others dentate. Corolla purple, ca. 1.6 cm; tube ca. 9 mm, glabrous; galea bent at a right angle apically, densely minutely pubescent; beak straight or bent slightly downward, 4–5 mm; lower lip 8–10 mm × 1.2–1.5 cm, ciliate. Filaments densely pubescent. Fl. Jun–Aug, fr. Sep–Oct.

290. Pedicularis tsarungensis

On rocks, alpine meadows; 3600–4200 m. NW Yunnan.

- Alpine meadows, open areas, thick grass and scrubs; 3300–4000 m. NW Yunnan.

1a. Flowers axillary, lax; bracts linear-oblong, short petiolate 292a. subsp. forrestiana

1b. Flowers in lax racemes, to 20 cm; bracts flabellate, long petiolate 292b. subsp. flabellifera

292a. Pedicularis forrestiana subsp. forrestiana

福氏马先蒿 (原亚种) fu shi ma xian hao (yuan ya zhong)

Flowers axillary, lax; bracts linear-oblong, short petiolate.

- Alpine meadows, open areas; 3300–4000 m. NW Yunnan.

292b. Pedicularis forrestiana subsp. flabellifera

扇苞福氏马先蒿 shan bao fu shi ma xian hao

Flowers in lax racemes, to 20 cm; bracts flabellate, long petiolate.

- Thick grass and scrubs. NW Yunnan.


菌生系 jun sheng xi

Herbs ± stemless. Roots few. Stems weak, flexuous. Leaves mostly or all basal. Stem leaves when present, few, alternate or often pseudo-opposite throughout. Flowers few, often pseudo-opposite; long pedicellate. Calyx slightly cleft anteriorly or not, 5-lobed. Corolla tube slightly longer than calyx; beak usually straight, slender.

- One species: endemic to China.

293. Pedicularis mychophila


菌生马先蒿 jun sheng ma xian hao

Herbs perennial, 5–9 cm tall, densely gray tomentose, drying ± black. Roots 1–5, fusiform, fleshy. Stems usually 2–4, slender, ascending, glandular pubescent, with brown hairs. Leaves mostly or all basal; petiole 2–5.5 cm, densely rust colored pubescent; leaf blade ovate-oblong to lanceolate-oblong, 0.7–3.5 cm × 3–13 mm, densely pubescent on both surfaces, pinnatisect; segments 5–13 pairs, triangular-ovate to oblong, incised-crenate. Stem leaves few if any. Flowers axillary or pseudo-opposite; proximal bracts leaflike, others very small, densely tomentose. Pedicel usually curved, to 1.3 cm, densely tomentose. Calyx ca. 1 cm, slightly cleft anteriorly or not, densely tomentose; lobes 5, unequal, short. Corolla purplish red, ca. 2.5 cm; tube erect, 1.1–1.3 cm, glabrous; galea bent at a right angle apically; beak straight or ± curved downward, ca. 5 mm; lower lip ca. 1.5 × 2 cm, glabrous but praemorse-dentate. Filaments 2 slightly pubescent, 2 glabrous. Capsule ovoid, ca. 1 cm × 4–5 mm, short mucronate. Fl. Jun-Jul, fr. Jul–Aug.

- Moss-covered rocks; 4200–4500 m. SE Xizang.


佛氏系 fo shi xi

Herbs low. Leaves alternate or often pseudo-opposite throughout, large. Pedicel to 2.5–8 cm. Flowers axillary. Calyx deeply cleft anteriorly, 2- or 3(–5)-lobed. Corolla tube slightly longer than calyx or not; galea usually crested; beak curved, slender.

- Two species: endemic to China.

1a. Stems branched; calyx lobes 2, 3-cleft and incised-dentate; beak of corolla pendant, parallel to calyx, curved apically

294. Pedicularis franchetiana


佛氏马先蒿 fo shi ma xian hao

Stems branched, sparsely long pubescent. Leaves opposite; petiole to 2.5 cm; leaf blade ca. 2 cm × 5 mm, pinnatifid-particle; segments ovate, dentate. Pedicel to 4 cm, exceeding leaves. Flowers axillary. Calyx ca. 6 mm, membranous, sparsely scabrous pubescent, reticulate near apex, 2-lobed, 3-cleft and incised-dentate. Corolla purple, ca. 1 cm; tube not exceeding calyx and shorter than galea, pubescent; galea falcate, usually crested; beak pendant, parallel to calyx, curved apically; lower lip ca. 1.2 × 1.6 cm, long ciliate, lobes ± equal, middle lobe rounded, scarcely exserted. Filaments 2 long pubescent, 2 glabrous.

- W Sichuan.

295. Pedicularis mussotii


谬氏马先蒿 miu shi ma xian hao
Herbs perennial, to 15 cm tall, drying slightly black. Roots slender, several, fusiform, ± fleshy. Stems usually 4 or 5, often procumbent or ascending, unbranched, densely fine pubescent and striate. Leaves mostly basal; petiole 2.5–10 cm, narrowly winged, sparsely pubescent; leaf blade 2–10.5 × 0.5–2.5 cm, abaxially sparsely pubescent along veins, adaxially glabrous or sparsely pubescent and finely pubescent among midvein, pinnatifid to nearly pinnatisect; segments 6–13 pairs, triangular-ovate to ovate, margin double dentate. Stem leaves usually nearly opposite, distal ones alternate, similar to basal leaves but smaller, shorter petiolate. Pedicel 3–11.5 cm, usually curved, finely pubescent. Flowers axillary. Calyx tube 5.5–10 mm, 2- or 3(–5)-lobed; posterior one smallest, entire or dentate, sometimes absent, lateral lobes incised-dentate. Corolla red; tube 7–10 mm, pubescent externally; galea ± bent at a right angle, with or without auriculate protrusion (crest); beak semicircular, 7–11 mm; lower lip 0.8–1.5 × 1.6–2.6 cm, long ciliate, middle lobe emarginate. Filaments pubescent. Capsule semi-globose, ca. 1.2 cm × 6.5 mm. Fl. Jul–Aug, fr. Aug.

- Alpine meadows; 3600–4900 m. SW and W Sichuan, NW Yunnan.
1a. Calyx lobes 5, posterior one small, lateral lobes leaflike .......................... 295c. var. mutata
1b. Calyx lobes 2 or 3, posterior one small or absent, lateral pair leaflike.

2a. Galea not crested in front . 295a. var. mussotii


假大花系 jia da hua xi

Herbs ± stemless or stems scapelike. Leaves mostly basal, persistent, often pinnatisect. Stem leaves alternate or pseudo-opposite. Inflorescences capitate or short racemose. Calyx lobes 2–5. Corolla more than 3 cm; tube usually not exceeding calyx; beak wide; lower lip often enveloping galea. Four species: Bhutan, China, N Myanmar, Nepal, Sikkim; all four in China.

1a. Inflorescences corymbiform; corolla yellow, 4–5 cm ........................................ 297.
1b. Inflorescences racemose; corolla purple or white, 2–3 cm.

2a. Lower corolla lip long ciliate, middle lobe reniform and cordate basally ......................... 296. P. elwesii
2b. Lower corolla lip glabrous, middle lobe oblong and not cordate basally.

3a. Beak of galea entire, not 2-cleft .......................................................... 297. P. aschitorrhyncha
3b. Beak of galea deeply 2-cleft .......................................................... 298. P. fletcheri


哀氏马先蒿 ai shi ma xian hao
Herbs perennial, 1.5–32 cm tall, densely pubescent, drying nearly black. Roots 2 or 3, ± fusiform, fleshy. Stems 1–4, erect or slightly spreading at base, unbranched, densely pubescent. Basal leaves sparsely cespitose; petiole 2–12 cm, densely tomentose; leaf blade ovate-oblong to lanceolate-oblong, 3.5–9.5(–18) × 1–2.5 cm, abaxially glabrous except for finely tomentose midvein, abaxially densely tomentose, pinnatifid; segments 10–20(–30) pairs, ovate to ovate-oblong, pinnatifid, margin double dentate. Stem leaves few, alternate or sometimes ± opposite, smaller than basal leaves, shorter petiolate. Racemes 5–8(–15) cm; bracts leaflike. Pedicel 0.7–1.5 cm. Calyx 1–1.2 cm, 1/2 cleft anteriorly; lobes 3 or 5, unequal, posterior lobe smallest, all dentate. Corolla purple to purplish red, 2.6–3 cm; tube erect, 8–10 mm; galea strongly curved; beak uncinate, 5–6 mm, 2-cleft or entire; lower lip completely enveloping galea, ca. 1.7–2 × 2–2.3 cm, long ciliate, middle lobe reniform and cordate basally. Filaments long pubescent. Capsule oblong-lanceolate, 1.7–2 cm × 5–6 mm. Fl. Jun–Aug, fr. Aug–Sep. Alpine meadows; 3200–4600 m. E, S, and SE Xizang, NW Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].

1a. Plants scarcely 1.5 cm tall; calyx lobes 5 ........................................... 296b. subsp. minor
1b. Plants 8–32 cm tall; calyx lobes 3.
2a. Stems slightly spreading basally, 8–20 cm tall; petiole of basal leaves to 5 cm; racemes 5–8 cm, usually compactly flowered ...................... 296a. subsp. elwesii
2b. Stems erect, to 32 cm tall; petiole of basal leaves to 12 cm; racemes to 15 cm, flowers lax basally 296c. subsp. major

296a. Pedicularis elwesii subsp. elwesii
哀氏马先蒿(原亚种) ai shi ma xian hao (yuan ya zhong)
Plants 8–20 cm tall. Stems slightly spreading basally. Petiole of basal leaves to 5 cm. Racemes usually compactly flowered, 5–8 cm. Calyx lobes 3.
Alpine meadows; 3200–4600 m. S and SE Xizang, NW Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].

矮小哀氏马先蒿 ai xiao ai shi ma xian hao
Plants scarcely 1.5 cm tall. Stems strongly spreading at base. Calyx lobes 5.
Alpine meadows; ca. 3800 m. E Xizang.

高大哀氏马先蒿 gao da ai shi ma xian hao
Plants to 32 cm tall. Stems erect. Petiole of basal leaves to 12 cm. Racemes laxly flowered basally, long, to 15 cm. Calyx lobes 3.
• SE Xizang, NW Yunnan.

全喙马先蒿 quan hui ma xian hao
Herbs ca. 17 cm tall. Stems erect, glabrous. Basal leaves few, to 12 cm; petiole long, narrowly winged; leaf blade ovate, abaxially sparsely pubescent, adaxially glabrous, pinnatifid; segments incised-dentate. Stem leaves few, alternate, similar to basal leaves but smaller. Inflorescences short racemose, 10–12-flowered; bracts leaflike, to 1 cm, glabrous. Calyx 1/2 cleft anteriorly, sparsely scabrous pubescent; tube cylindric, 2-lobed, 6–8 mm, leaflike, pinnatifid. Corolla white, with purple galea, large; tube slender, to 2 cm, not exceeding calyx; galea ± falcate, 3–4 mm wide; beak decurved, relatively short, entire; lower lip not ciliate, middle lobe oblong. Filaments 2 pubescent, 2 glabrous. Fl. Jul.
• Marshy meadows; 3400–3600 m. SE Xizang.

阜莱氏马先蒿 fu lai shi ma xian hao
Pedicularis fletcheriana P. C. Tsoong.
Herbs annual, to 40 cm tall, not drying black. Stems single or to 10, erect, outer stems usually ascending, glabrous. Basal leaves few, usually withering early. Stem leaves only 1 or 2, alternate or sometimes pseudo-opposite; petiole to 2.5 cm, long glandular ciliate; leaf blade oblong-lanceolate, to 5 × 2 cm, glabrous on both surfaces, pinnatisect; segments ca. 7 pairs, ovate-oblong, incised-dentate. Inflorescences racemose, to 15 cm; bracts leaflike, proximal ones larger than leaves. Pedicel to 1.5 cm. Calyx ca. 2.3 cm, 1/4 cleft anteriorly, long pubescent; lobes 2 or 4, unequal, leaflike. Corolla white, with red-tinged center to lower lip, ca. 2.8 cm; tube ca. 2.2 cm, glabrous; galea slightly falcate, to 2.5 mm wide; beak bent downward, ca. 3 mm, 2-cleft; lower lip completely enveloping galea, ca. 1.6 × 2 cm, finely ciliate or glabrous, middle lobe emarginate. Filaments 2 pubescent, 2 glabrous. Capsule to 1.5 cm × 9 mm. Seeds ca. 2.3 × 1.2 mm. Fl. Jul.
Alpine meadows; 3500–4200 m. SE Xizang [Bhutan].

伞房马先蒿 san fang ma xian hao
Herbs perennial, 10–20 cm tall, drying black. Roots conical, fleshy, to 12 cm. Stems usually numerous, procumbent or ascending. Basal leaves laxly cespitose; petiole to 7 cm, broadly winged, densely pubescent; leaf blade ovate to ovate-oblong, 4–7 × 1–3 cm, pinnatifid to pinnatisect; segments 7–12 pairs, ovate to rounded, dentate. Stem leaves few. Inflorescences corymbiform, 5–8-flowered; bracts leaflike. Calyx oblong, 18–20 cm, pilose, 1/2 cleft anteriorly; lobes 3, unequal. Corolla yellow with red beak, 4–5 cm; tube erect, slightly longer than calyx; galea slightly falcate, ± twisted; beak bent downward, 3–4 mm, 2-cleft; lower lip usually enveloping galea, ciliate, middle lobe emarginate. Anterior filaments densely pubescent. Fl. Jul, fr. Aug.
• Open rocky slopes, open forests; ca. 3400 m. E Xizang.

白花系 bai hua xi
Herbs low or some stemless. Leaves basal. Flowers few, often capitate. Pedicel long. Calyx (3–)5-lobed. Corolla ± red-purple; tube long, often more than 2 × as long as calyx; beak slender; lower lip less than 2 cm wide.
About four species: China, Nepal; three species in China.
1a. Corolla tube ca. 1 cm; glabrous; filaments 2 pubescent, 2 glabrous ........................................ 300. *P. rhizomatosa*

1b. Corolla tube 2.2–2.5 cm, sparsely pubescent; all filaments pubescent.
   2a. Galea not 2-auriculate protuberant, beak 5–5.5 mm; plants drying dark black ..................... 301. *P. tayloriana*
   2b. Galea 2-auriculate protuberant, beak ca. 4 mm; plants not drying black ............................. 302. *P. tapaoensis*


根茎马先蒿 *gen jing ma xian hao*

Herbs perennial, less than 7 cm tall, not drying black. Rootstock slender. Stems 1, 3, or 4, sparsely pubescent. Leaves basal; petiole to 3 cm, glabrous; leaf blade ovate-oblong, 6–11 × 3–5 mm, pinnatipartite to pinnatisect; segments 3 or 4 pairs, ovate, pinnatifid to coarsely dentate. Inflorescences capitate, ± umbel; bracts leaflike, sparsely long white pubescent. Calyx ca. 6–7 mm; tube ca. 4 mm, lobes 5, unequal. Corolla tube ca. 1 cm, glabrous; galea falcate apically; beak straight or bent slightly downward, 5–6 mm; lower lip tri-angular, ca. 8 × 7 mm, glandular ciliate, middle lobe broadly ovate, ca. 2.5 × 3.5–4 mm, ± hoodlike. Anterior filaments minutely pubescent. Fl. Jun, fr. Jul.

• Avalanche-disturbed slopes; ca. 3900 m. SE Xizang.


泰氏马先蒿 *tai shi ma xian hao*

*Pedicularis taylorii* P. C. Tsoong.

Herbs perennial, less than 7 cm tall, shiny, barely glabrous throughout, drying dark black. Rootstock short. Stems usually 2–4. Leaves almost all basal; petiole 1–1.5 cm, membranously winged; leaf blade 5–10 × 2.5–4.5 mm, pinnatipartite to pinnatisect; segments 5 or 6 pairs, ovate, incised-dentate. Flowers 1–4, single or pseudo-opposite; bracts leaflike, small. Pedicel to 4–10 mm, with 2 lines of hairs. Calyx ca. 7 mm, usually glandular pubescent basally, more than 1/2 cleft anteriorly; lobes 3–5, unequal, posterior one small, linear and entire, sometimes absent, lateral lobes distinctly serrate apically. Corolla red, with white dots on throat; tube ca. 2.2 cm, pubescent; galea bent at a right angle; beak 5–5.5 mm; lower lip ca. 9 mm × 1.4 cm, ciliate. Filaments pubescent. Fl. Jun.

• Open grassy hillsides. E Xizang.


大炮马先蒿 *da pao ma xian hao*

Herbs perennial, to 6 cm tall, not drying black. Rootstock short. Stems cespitose, less than 1 cm or barely stemless. Leaves many, densely tufted; petiole 0.8–2.2 cm, broadly winged, glabrous; leaf blade elliptic-ovate to oblong, ca. 1 cm × 4.5–7 mm, glabrous on both surfaces, pinnatisect; segments 4–6 pairs, ovate, pinnatifid or coarsely dentate. Flowers solitary in leaf axils. Pedicel to 1 cm. Calyx ca. 7–9 mm, subglabrous, ciliate, tube ca. 5 mm, more than 1/3 cleft anteriorly; lobes 5, unequal, serrate. Corolla purple-red; tube ca. 2.5 cm, sparsely pubescent; galea ± bent at a right angle, with 2-auriculate protuberances; beak straight or bent slightly downward, ca. 4 mm.


• Open alpine meadows; ca. 4700 m. W Sichuan.


魏氏系 *wei shi xi*

Herbs low, ± stemless. Leaves long petiolate, shallowly crenate lobed to pinnatipartite. Flowers axillary. Calyx deeply cleft anteriorly, 2- or 3-lobed. Corolla longer than calyx, mostly more than 2 × as long, expanded apically; beak long; lower lip large.

• Four species: endemic to China.

1a. Leaves shallowly crenate lobed; corolla with purple galea and yellowish lower lip; calyx 2-lobed; beak of galea S-shaped ................................................................................................................................ ........... 306. *P. bicolor*

1b. Leaves pinnatipartite or pinnatisect; corolla red throughout or red with a purple-red galea; calyx 3- or 5-lobed; beak of galea not S-shaped.
   2a. Calyx 5-lobed; petiole of basal leaves to 3 cm ................................................................ 305. *P. dulongensis*
   2b. Calyx 3-lobed; petiole of basal leaves to 2 cm.
      3a. Calyx 2/3 cleft anteriorly; corolla red throughout, tube 3–4 cm; beak of galea ca. 4 mm; lower lip 1.5–2 × 2.5–3 cm ........................................................................................................ 303. *P. wilsonii*
3b. Calyx 1/3 cleft anteriorly; corolla red with purple-red galea, tube ca. 5 cm; beak of galea 5.5–7 mm; lower lip ca. 1 × 1.5 cm


魏氏马先蒿  wei shi ma xian hao
Herbs perennial, to 9 cm tall, drying ± black. Roots fusiform, ± fleshy. Stems 2 or 3, 2–3 cm, or ± absent, pubescent. Basal leaves few; petiole 1.5–2 cm; leaf blade elliptic to oblance-oblong, to 9 cm, glabrous on both surfaces, pinnatifid or coarsely serrate. Pedicel 1–2 cm, slender, pubescent. Calyx red throughout; tube 3–4 cm, slender; galea falcate apically; beak bent downward, straight or cylindrical, ca. 4 mm; lower lip 1.5–2 × 2.5–3 cm, middle lobe ca. 1/2 size of lateral lobes, sparsely ciliate. Filaments glabrous or pubescent.

• Sichuan.


盐源马先蒿  yan yuan ma xian hao
Herbs perennial, 5–8 cm tall, pubescent, drying slightly black. Roots fleshy. Stems usually 3–5, short or ± absent, spreading to ascending. Leaves mostly basal; petiole to 2 cm, pubescent; leaf blade lanceolate-oblong, 1–3 cm, pubescent along veins, pinnatisect; segments 5–8 pairs, ovate-oblong. Stem leaves usually pseudo-opposite, smaller than basal leaves. Flowers few. Pedicel 1–2.5 cm, glabrescent. Calyx 1–1.5 cm, 2/3 cleft anteriorly, pubescent; lobes 3, unequal, posterior one linear, entire, leaflike. Corolla red throughout; tube 3–4 cm, slender; galea falcate apically; beak bent downward, straight or cylindrical, ca. 4 mm; lower lip 1.5–2 × 2.5–3 cm, middle lobe ca. 1/2 size of lateral lobes, sparsely ciliate. Filaments glabrous or pubescent.

• Sichuan.


独龙马先蒿  du long ma xian hao
Herbs perennial, to 10 cm tall, drying ± black. Stems ca. 1 cm tall or ± absent. Basal and stem leaves densely clustered; petiole 1–3 cm, slender, glabrous; leaf blade elliptic-oblong to oblance, ca. 3 cm, abaxially pubescent, adaxially glabrous, pinnatisect; segments 5–9 pairs, ovate, pinnatifid or coarsely serrate. Pedicel 1–1.5 cm. Calyx cylindric-campanulate, ca. 1.8 cm, 2/3 cleft anteriorly, densely white villous with multicellular hairs; lobes 5, unequal, leaflike, posterior one smaller than lateral lobes. Corolla red, obscure, 6–7 cm; tube erect, 4–5 cm, villous with multicellular hairs; galea nearly falcate, very enlarged; beak incurved, 5–6 mm; lower lip 1.2–1.4 × 3–3.5 cm, middle lobe smaller than lateral pair. Filaments pubescent. Capsule ovoid-oblong, 1–1.5 cm. Fl. Jul, fr. Jul–Aug.

• Moist meadows on mountain slopes; 3500–3600 m. NW Yunnan.


二色马先蒿  er se ma xian hao
Herbs 5–6 cm tall, pubescent. Stems ± absent. Leaves nearly all basal; petiole 1–1.5 cm; leaf blade elliptic, 1–1.5 cm × 5–6 mm, shallowly crenate lobed; segments ± crenulate. Pedicel 1–1.5 cm. Calyx cylindric; tube ca. 1.2 cm × 4 mm, 1/3 cleft anteriorly; lobes 2, ca. 5 mm, leaflike, dentate. Corolla with purple galea and yellowish lower lip, 2–2.4 cm; tube ca. 1.5 × as long as calyx, sparsely pubescent; galea erect basally, bent apically, ca. 8 mm; beak S-shaped, 4–5 mm; lower lip ca. 1.5 cm wide, glabrous, middle lobe much smaller than lateral pair, 5–6 × ca. 5 mm, emarginate. Filaments pubescent. Fl. Jul.

• SE Shaanxi.


新粗管系  xin cu guan xi
Herbs less than 10 cm tall. Stems scarcely present, weak, curved. Leaves mostly basal. Pedicel to 4 cm. Flowers axillary. Calyx deeply cleft anteriorly, 3-lobed. Corolla ± red-purple; tube 5–6 × as long as calyx; galea circinate-incurved basally; beak semicircular; lower lip large.

• One species: endemic to China.


新粗管马先蒿  xin cu guan ma xian hao
Herbs perennial, usually less than 10 cm tall, drying ± black. Roots fleshy. Stems scarcely present to 2–4 cm, glabrous. Basal leaves numerous; petiole to 2.3 cm; leaf blade lanceolate-oblong to narrowly lanceolate, 1–2 cm × 3.5–7 mm, long pubescent along midvein when young, glabrescent, pinnatisect; segments 6–8 pairs, ovate to oblong, margin double dentate. Stem leaves usually pseudo-opposite, slightly smaller than basal leaves. Flowers few, axillary, pseudo-opposite or from basal leaves. Pedicel black, to 4 cm, glandular pubescent. Calyx 7–9 mm, 3/4 cleft anteriorly; lobes 3, unequal, posterior one spinescent and entire, lateral pair larger, incised-serrate. Corolla reddish purple; tube to 5 cm, pale purple pubescent; galea with auriculate protuberance near margin; beak semicircular, 6–7 mm; lower lip ca. 2 × 2.4 cm. Filaments pubescent. Fl. Jul–Aug, fr. Sep.
Herbs perennial, 5–10(–20) cm tall, drying black. Stems usually scapelike, woolly. Leaves mostly basal; petiole to 5 cm, pubescent; blade linear-lanceolate to linear, 1.5–7 cm, abaxially sometimes pubescent along veins, adaxially usually glabrous, pinnatisect; segments 10–30 pairs, ovate to oblong, dentate. Stem leaves 1 or 2, similar to basal leaves but smaller. Inflorescences ca. 5(–10) cm; bracts linear-lanceolate to linear, ca. as long as to shorter than flowers, usually woolly. Calyx 0.9–1.2 cm; lobes 5, ± equal. Corolla yellow, with purple galea, occasionally lower lip purple-spotted, more than 2 cm; tube falcate apically, 1.2–1.6 cm, apex obtuse or ± acute; galea 0.7–1.4 cm, rounded in front; lower lip spreading. Capsule oblique. Anterior filament pair pubescent. Stigma included or slightly exserted. Capsule long ovoid to ovoid-lanceolate, to 1.8 cm × 7 mm. Fl. Jun.–Aug. Leaf segments 10–20 pairs. Calyx and galea 0.7–1.4 cm × ca. 3.5 mm, shorter than tube; middle lobe of lower lip not projected. Alpine meadows, pastures, damp limestone rocks, tundra; 2600–5400 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, Japan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; C and N Europe, N North America].

1a. Bracts rhombic-ovate to broadly ovate; plants usually less than 4 cm tall

1b. Bracts linear-lanceolate to linear; plants usually 5–10 cm tall

2a. Galea rounded in front; stigma included or very short exserted

2b. Galea not rounded in front, distinctly obliquely truncate at apex; stigma long exserted, to 4 mm

308. Pedicularis oederi Vahl in Hornemann, Dansk Oekonom. Plantel. ed. 2, 580. 1806. 欧氏马先蒿 ou shi ma xian hao

Herbs perennial, 5–10 cm tall, drying black. Stems usually scapelike, woolly. Leaves mostly basal; petiole to 5 cm, pubescent; blade linear-lanceolate to linear, 1.5–7 cm, abaxially sometimes pubescent along veins, adaxially usually glabrous, pinnatisect; segments 10–30 pairs, ovate to oblong, dentate. Stem leaves 1 or 2, similar to basal leaves but smaller. Inflorescences ca. 5(–10) cm; bracts linear-lanceolate to linear, ca. as long as to shorter than flowers, usually woolly. Calyx 0.9–1.2 cm; lobes 5, ± equal. Corolla yellow, with purple galea, occasionally lower lip purple-spotted, more than 2 cm; tube falcate apically, 1.2–1.6 cm, apex obtuse or ± acute; galea 0.7–1.4 cm, rounded in front; lower lip spreading. Capsule oblique. Anterior filament pair pubescent. Stigma included or slightly exserted. Capsule long ovoid to ovoid-lanceolate, to 1.8 cm × 7 mm. Fl. Jun.–Aug. Leaf segments 10–20 pairs. Calyx and galea 0.7–1.4 cm × ca. 3.5 mm, shorter than tube; middle lobe of lower lip not projected. Alpine meadows, pastures, damp limestone rocks, tundra; 2600–5400 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, Japan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; C and N Europe, N North America].

1a. Leaf segments 10–20 pairs ...... 307a. subsp. oederi
1b. Leaf segments 25–30 pairs 307b. subsp. multipinna

308a. Pedicularis oederi subsp. oederi 欧氏马先蒿(原亚种) ou shi ma xian hao (yuanyan zhong)

Pedicularis versicolor Wahlenberg.

Leaf segments 10–20 pairs. Calyx lobes broadly lanceolate, entire to dentate apically. Corolla galea 0.7–1.4 cm × ca. 3.5 mm, shorter than tube; middle lobe of lower lip not projected. Alpine meadows, pastures, moist meadows of mountain slopes, damp limestone rocks, tundra; 4000–5400 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, S, SE, and W Xizang, Yunnan [Bhutan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; C and N Europe, N North America].

Four varieties were treated in the Fl. Reipubl. Popularis Sin.: var. oederi with a 7–9 × 3–3.5 mm galea and broadly lanceolate, entire to distally dentate calyx lobes; var. heteroglossa Prain with a 1.1–1.4 cm galea; var. sinensis (subsp. branchysphylla) (Pennell) P. C. Tsong is here treated as a synonym) with a 7–9 mm galea and calyx lobes with spatulate dentate-lobulate tips; and var. angustiflora (H. Limpricht) P. C. Tsong with a 2 mm wide galea. Variety oederi includes two forms: f. oederi with a yellow corolla and sometimes a purple galea or lower lip with purple spots, and f. rubra (Maximowicz) P. C. Tsong with a dark red corolla. T. Yamazaki (Fl. Japan IIIa: 369–370. 1993) treated the plants occurring in Japan as Pedicularis oederi subsp. heteroglossa (Prain) Pennell.


1b. Bracts rhombic-ovate to broadly ovate; plants usually less than 4 cm tall


Herbs perennial, 8–10 cm tall, drying black. Roots numerous. Stems scapelike, white woolly. Basal leaves usually in a rosette; petiole 1–5 cm, pubescent; leaf blade linear-lanceolate to linear, 2–7 cm × 5–10 mm, abaxially white scurfy, adaxially pilose, pinnatisect; segments 15–25 pairs, ovate to oblong, dentate. Stem leaves 1 or 2. Inflorescences racemose; bracts linear. Pedicel 2–4 mm. Calyx oblong, ca. 1 cm, slightly cleft anteriorly, white woolly, 5-lobed. Corolla yellow, ca. 2.3 cm; tube erect, longer than calyx; galea not rounded in front, distinctly obliquely truncate at apex; lower lip shorter than galea, ca. 6 × 8 mm, middle lobe rounded, smaller than lateral pair. Anterior filament pair pubescent. Stigma long exserted, to 4 mm. Fl. Jun.

1. About 4300 m. S Xizang.


leaf petiole 1–1.5 cm, slender, puberulent; leaf blade oblong-lanceolate, ca. 2.2 cm × 8 mm, puberulent to glabrescent; pinnatisect to pinnatifid; segments 8–10 pairs, dentate. Inflorescences ca. 2 cm, few flowered; distal bracts rhombic-ovate to broadly ovate, crenate-serrate. Pedicel 2–3 mm. Calyx ca. 8 × 3–4 mm; lobes 5, unequal, posterior one triangular and entire, lateral lobes larger, ovate, serrate. Corolla yellow throughout, to ca. 2.3 cm; tube ca. 1.1 cm. Galea straight, rounded apically; lower lip ca. 9 mm, erose, middle lobe smaller than lateral pair, projecting. Anterior filament pair villous apically. Capsule oblong-ovoid, ca. 1.1 cm × 4 mm. Fl. Jun, fr. Jul–Aug.

• Grassy slopes; 4000–5300 m. W Sichuan, NW Yunnan.


拟紫堇系 ni zi jin xi

Stems and branches often procumbent to ascending. Leaves alternate or pseudo-opposite, pinnatisect. Inflorescences terminal, usually distinctly centrifugal, or flowers axillary. Calyx 5-lobed. Corolla tube decurved distally; galea toothless, beakless; lower lip spreading.

• Three species: endemic to China.

1a. Galea straight, ca. 6 mm; leaf segments usually 4–6 pairs .................................................. 311. P. corydaloides

1b. Galea falcate, 7–9 mm; leaf segments usually 7–12 pairs.

2a. Roots ± fusiform, fleshy; middle lobe of lower corolla lip entire, slightly projecting .......... 312. P. cryptantha

2b. Roots slender; middle lobe of lower corolla lip emarginate, much projecting .......... 313. P. nyingchiensis


拟紫堇马先蒿 ni zi jin ma xian hao

Herbs perennial, to 16 cm tall, slender. Stems erect, short, slender, sparsely long branched apically, with remote scales basally, outer stems usually procumbent to ascending, sometimes branched, pubescent. Basal leaves numerous, petiole to 4 cm, slender, puberulent; leaf blade ovate-elliptic to ovate-oblong, 1–4 × ca. 1.8 cm, abaxially white scurfy, adaxially glabrous; segments usually 4–6 pairs, ovate to oblong, pinnatifid or incised-dentate. Stem and leaves usually pseudo-opposite, smaller than basal leaves. Flowers axillary, usually racemose, centrifugal. Pedicel 2–10(–14) mm. Calyx 5–6 mm, pubescent; lobes 5, unequal, posterior one usually lanceolate and entire, lateral lobes larger, serrate. Corolla yellow; tube cylindric, longer than calyx; galea straight, ca. 6 mm, sparsely glandular pilose apically, rounded in front, minutely apiculate at apex; lower lip ca. as long as galea, ciliate, lobes ± equal, rounded. Filaments pubescent. Capsule ca. 5 × 4–4.5 mm. Fl. Jul–Aug, fr. Aug–Sep.

• Forests, shrubby grass of hillsides, alpine meadows; 3200–3800 m. SE Xizang [Bhutan].


隐花马先蒿 yin hua ma xian hao

Herbs perennial, to 12(–14) cm tall, drying ± black. Roots ± fusiform, fleshy. Stems usually procumbent to ascending, short, pubescent; branches densely clustered. Basal leaves numerous; petiole to 6 cm, sparsely pubescent; leaf blade ovate-oblong to ovate, 3.5–7 × ca. 1.8 cm, adaxially sparsely pubescent to glabrous; segments 8–12 pairs, linear-lanceolate, margin double dentate. Flowers axillary, 10–20-flowered, sometimes racemose apically, centrifugal; bracts leaflike, lanceolate. Pedicel more than 2 cm, slender. Calyx tube cylindric, ca. 4 mm, sparsely to densely pubescent; lobes 5, unequal. Corolla yellow, 1.6–2 cm, tube expanded, curved apically; galea ± falcate, 7–9 mm, front rounded, apex slightly acute; lower lip with middle lobe rounded, smaller than lateral lobes, entire, slightly projecting. Filaments glabrous. Fl. May–Aug, fr. Sep–Oct.

Grassy stream banks, woods and Pinus forests; 2700–4700 m. SE Xizang [Bhutan].

1a. Stems usually procumbent to ascending, ca. 10 cm tall; leaves to 12(–14) cm; calyx usually sparsely pubescent 312a. subsp. cryptantha

1b. Stems erect, ca. 7 cm tall; leaves barely 4.5 cm; calyx usually densely pubescent 312b. subsp. erecta

312a. Pedicularis cryptantha subsp. cryptantha

隐花马先蒿(原亚种) yin hua ma xian hao (yuan ya zhong)

Stems usually procumbent to ascending, ca. 10 cm tall. Leaves to 12(–14) cm. Calyx usually sparsely pubescent.

• Grassy streambanks, woods. 2700–4700 m. SE Xizang.


直立隐花马先蒿 zhili yin hua ma xian hao

Stems erect, ca. 7 cm tall. Leaves barely 4.5 cm. Calyx usually densely pubescent.

• Pinus forests. SE Xizang.


林芝马先蒿 lin zhi ma xian hao

Herbs perennial, ca. 12–15 cm tall, drying ± black. Roots slender. Stems usually 8–10, cespitose; lateral branches procumbent to ascending, sparsely white
villous. Leaves alternate; petiole 1–5 cm; leaf blade ovate-oblong to oblong, 2–5 × 1–2 cm, adaxially white villous; segments 7–9 pairs, ovate to oblong, coarsely dentate. Inflorescences short racemose; bracts leaflike. Pedicel 0.3–2 cm. Calyx cylindric, 7–8 mm, sparsely white villous; lobes 5, unequal. Corolla cream colored, 1.6–2 cm; tube expanded and slightly curved apically; galea falcate, 7–9 mm, rounded in front, apex sometimes acute; lower lip ca. 1 cm, erose, middle lobe emarginate, much projecting. Anterior filament pair pubescent. Fl. May–Jun, fr. Jul–Aug.

- Rocks at streamsides, Quercus thickets; 3000–3300 m. E Xizang.


Herbs less than 15 cm tall. Roots fusiform, fleshy. Leaves alternate. Basal leaves numerous; petiole long; leaf blade pinnatisect. Inflorescences more than 1/2 height of plant, centrifugal. Calyx lobes 5. Corolla tube decurved; galea with 1 marginal tooth near apex, beakless.

- Two species: endemic to China.

1a. Corolla yellow with purple-red galea; filaments 2 pubescent, 2 glabrous ........................ 314. 
1b. Corolla red throughout; filaments 2 densely pubescent, 2 glabrous .............................. 315.


假多色马先蒿 jia duo se ma xian hao

Herbs perennial, 10(–15) cm tall, drying black. Roots numerous. Stems usually single, stout, pubescent. Basal leaf petiole 2.5–4 cm; leaf blade lanceolate, 2–6 × ca. 1 cm, abaxially white scurfy, tinged with purple along veins, pinnatisect; segments 11–18 pairs, oblanceolate, sparsely ciliate, incised-dentate. Stem leaves 1–3 or absent, alternate. Inflorescences 3–10 cm, dense; proximal bracts leaflike, pubescent. Pedicel to 4 mm or almost absent, wide. Calyx 1–1.2 cm; lobes 5, unequal. Corolla yellow, with purple-red galea, 2.3–2.8 cm; tube slightly bowed and expanded apically, slightly longer than calyx; galea bent apically, 1–1.4 cm; lower lip shorter than galea, sparsely ciliate. Filaments 2 pubescent apically, 2 glabrous throughout. Fl. Jun–Aug, fr. Sep.

Alpine meadows; (3600–)4300–4500 m. S Xizang (Chumbi Xian), NW Yunnan [Bhutan].


哈巴山马先蒿 ha ba shan ma xian hao

Herbs perennial, 3.5–15 cm tall, drying black. Stems 1 to several, erect, unbranched, with lines of hairs. Basal leaf petiole 2.5–4 cm, fleshy, glabrous; leaf blade linear to elliptic-oblong, 3–4 × ca. 1 cm, pinnatisect; segments 8–23 pairs, triangular or ± ovate-oblong, pinnatifid, incised-dentate. Stem leaves few, alternate. Inflorescences dense; proximal bracts linear. Flowers short pedicellate. Calyx 1–1.2 cm; lobes 5, unequal, long ciliate. Corolla red throughout; tube ca. 1.2 cm; galea ca. as long as tube, slightly falcate; lower lip much shorter than galea. Filaments 2 densely pubescent, 2 glabrous. Fl. Jul, fr. Aug.

- Alpine swampy meadows; 4100–4600 m. NW Yunnan.


喙齿马先蒿 hui chi ma xian hao

Herbs moderately tall. Roots fusiform. Leaves almost all basal; leaf blade pinnatisect. Inflorescences centrifugal. Calyx lobes 5. Corolla large; galea projected into a broad beaklike apex, with several marginal teeth on each side.

- One species: endemic to China.
oblong, pinnatifid to incised-dentate. Stem leaves few, alternate, smaller than basal leaves. Inflorescences 3–7(–9) cm; bracts slightly longer than calyx. Pedicel short, sparsely pubescent. Calyx ca. 1.1 cm, slightly cleft anteriorly; lobes 5, ± equal, serrate. Corolla purple-red, 2–2.2 cm; tube as long as calyx; galea bent apically, 1–1.2 cm, truncate, proximal teeth most distinct and longest; lower lip slightly shorter than galea, praemorse-serrulate and ciliate. Filaments 2 pubescent, 2 glabrous. Capsule lanceolate-ovoid, ca. 1.4 cm. Fl. May–Jun, fr. Jun–Aug.

- Alpine meadows, grassy slopes; 3700–4700 m. SW and W Sichuan.


Herbs mostly low. Roots fleshy. Leaves almost all basal; stem leaves alternate; petiole long; blade pinnatifid to pinnatisect. Inflorescences racemose, centrifugal, or flowers axillary. Calyx 5-lobed. Corolla large; tube less than 2 × as long as calyx; beak short, sometimes dentate apically; lower lip often less than 1.2 cm wide.

Nine species: Bhutan, China, Nepal, Sikkim; eight species in China.

1a. Corolla purple-red to red throughout.

2a. Leaf segments 10–25 pairs; beak of corolla dentate apically; calyx 1.1–1.3 cm.

3a. Leaves 2–3 cm, pinnatifid; lower corolla lip not ciliate; filaments pubescent; capsule lanceolate, ca. 2 cm

... P. wallichii

3b. Leaves 2–6 cm, pinnatisect; lower corolla lip ciliate; filaments 2 pubescent, 2 glabrous; capsule oblong, ca. 1.2 cm

... P. filicula

2b. Leaf segments 5–11 pairs; beak of corolla 2-cleft apically; calyx 5–11 mm.

4a. Corolla ca. 2.5 cm; lower lip not ciliate; leaves pinnatisect ............ P. tsangchanensis

4b. Corolla ca. 1.6 cm; lower lip ciliate; leaves pinnatisect to pinnatisect ............ P. anomala

1b. Corolla white to yellow at least on throat.

5a. Corolla yellowish white; leaf segments 3–5 pairs; filaments pubescent .................................. P. potaninii

5b. Corolla bicolored; leaf segments 6–20 pairs; filaments 2 pubescent.

6a. Corolla yellow with purple beak; leaf segments 10–20 pairs ............................................. P. lecomtei

6b. Corolla red with yellowish white throat; leaf segments 6–13 pairs.

7a. Leaf blade oblong, 1.5–3 cm, pinnatisect; inflorescences ca. 10-flowered ............ P. filiculiformis

7b. Leaf blade lanceolate-oblong, 0.7–1.5 cm, pinnatisect; inflorescences ca. 7- or 8-flowered 324. P. takpoensis


勒公氏马先蒿  le gong shi ma xian hao

Herbs perennial, 5–12 cm tall, drying black. Roots fascicled, fusiform. Stems unbranched, rust colored villous. Leaves barely all basal; petiole 3–4 cm, pubescent; leaf blade oblong-lanceolate to linear-lanceolate, 3–5.5 cm × 6–11 mm, abaxially densely white scurfy, adaxially glabrescent, pinnatisect; segments 10–20 pairs, ovate to long ovate, pinnatifid or incised-dentate. Inflorescences racemose, 4–5 cm; proximal bracts leaflike. Pedicel 1–1.5 cm, slender, densely rust colored villous. Calyx 1–1.5 cm, villous, slightly cleft anteriorly; lobes 5, unequal, leaflike. Corolla yellow, with purple beak, 3–3.5 cm; tube straight, 1.2–2.2 cm, glabrous; galea ± falcate apically; beak 2–2.5 mm, indistinctly marginally 1- or 2-toothed near apex; lower lip ca. 1.1 × 1.6 cm, not ciliate. Anterior filament pair densely villous. Fl. Jun–Jul, fr. Jul–Aug.

- Rocky slopes; ca. 3500 m. NW Yunnan.


瓦氏马先蒿  wa shi ma xian hao

Herbs perennial, 3.5–12 cm tall, drying black. Roots fleshy, fusiform. Stems single, unbranched. Basal leaves few, 1–4. Petiole 2–6 cm. Stem leaves 1–3, linear-lanceolate, 2–3 cm × 2.5–5 mm, pinnatifid; segments 12–25 pairs, ovate-lanceolate, sinuate-dentate. Inflorescences racemose, 2–5-flowered; bracts leaflike, ca. 1.6 cm. Pedicel short. Calyx ca. 1.3 cm, glabrous, slightly cleft anteriorly; lobes 5, lanceolate, equal. Corolla purple-red; tube 1.6–1.8 cm; galea falcate; beak ca. 3.5 mm, truncate apically, denticulate; lower lip ca. 1.6 cm wide, glabrous, sinuate-dentate. Filaments pubescent apically. Capsule obliquely lanceolate, ca. 2 cm × 7.5 mm. Fl. Jun–Aug, fr. Aug.

Alpine meadows; 3800–4800 m. S and SE Xizang [Bhutan, Nepal]. This might be Pedicularis tantalorhynchoides T. Yamazaki, since P. wallichii is W Himalayan. Further study is needed on Chinese specimens labelled as P. wallichii.


拟蕨马先蒿  ni jue ma xian hao
Herbs perennial, 5–18 cm tall, drying dark black. Roots fleshy, fusiform, fascicled. Stems 3 or 4(–6), unbranched, with 2 or 3 lines of densely rust colored hairs. Leaves mostly basal, usually in a dense rosette; petiole 2–4 cm, sparsely pubescent apically; leaf blade linear-lanceolate, 2–6 cm × 5–13 mm, abaxially white scurfy, adaxially glabrous, pinnatisect; segments 10–25 pairs, lanceolate-ovate, margin double dentate. Stem leaves few, smaller than basal leaves or absent. Inflorescences 2–(3–)10 cm, centrifugal, usually densely pubescent, with long rust colored hairs. Pedicel 1–3 mm. Calyx 1.1–1.3 cm; lobes 5, unequal, leaflike. Filaments glabrous or anterior pair sparsely pubescent. Capsule oblong, ca. 1.2 cm × 5 mm. Fl. May–Jul, fr. Jul–Aug.

- Alpine meadows; 2800–4900 m. SW Sichuan, Yunnan.

1a. Beak of corolla 3–4 mm; middle lobe of lower lip smaller than lateral lobes; anterior filament pair sparsely pubescent, posterior pair glabrous ................ 319a. var. filicula

1b. Beak of corolla less than 3 mm; middle lobe of lower lip larger than lateral lobes; filaments glabrous ................ 319b. var. saganaica

319a. Pedicularis filicula var. filicula

波氏马先蒿 bo shi ma xian hao

Corolla beak 3–4 mm; middle lobe of lower lip smaller than lateral lobes. Anterior filament pair sparsely pubescent. Filaments glabrous. About 4000 m. NW Yunnan.

319b. Pedicularis filicula var. saganaica

拟蕨马先蒿 (原变种) ni jue ma xian hao (yuan bian zhong)

Corolla beak less than 3 mm; middle lobe of lower lip larger than lateral lobes. Anterior filament pair densely so. Fl. Jun.

Herbs perennial, 8–15 cm tall, drying black. Roots linear, slightly fleshy. Stems usually 2 or 3, ascending, unbranched, ± pubescent, with 1 or 2 lines of hairs. Basal leaf petiole ca. 3 cm, pubescent; leaf blade ovate-oblong to lanceolate-oblong, ca. 4 × 1.3 cm, abaxially densely long pubescent along midvein, adaxially slightly pubescent, pinnatifid to pinnatipartite; segments 6–11 pairs, crenate-dentate. Stem leaves alternate, sometimes pseudo-opposite, shorter petiolate; leaf blade ca. 3.5 × 1.5 cm. Inflorescences racemose, centrifugal; proximal bracts leaflike, distal ones linear, ca. as long as calyx. Pedicel ca. 1 cm basally, slender, pubescent. Calyx 1–1.1 cm, slightly cleft anteriorly, densely pubescent; lobes 5, unequal, dentate. Corolla red, ca. 2.5 cm; tube erect, ca. 1.6 cm, sparsely pubescent; galea bent apically; beak ca. 5 mm, 2-cleft apically; lower lip ca. 1.3 × 1.2 cm, glabrous, erose-dentate. Anterior filament pair pubescent.

- About 4000 m. NW Yunnan.

320. Pedicularis potaninii

奇异马先蒿 qi yi ma xian hao

Herbs perennial, ca. 30 cm tall, ± drying black. Roots conical. Stems 1, 3, or 4, branched. Basal leaves withering early, long petiolate. Stem leaves alternate; petiole 0.5–1.5 cm; leaf blade oblong to oblong-ovate, 1–4 cm, abaxially densely white scurfy, pinnatifid to pinnatipartite; segments 5–9 pairs, obliquely ovate to oblong, serrate. Inflorescences centrifugal, subcapitate, lax basally; bracts leaflike. Pedicel 4–8 mm. Calyx 5–8 mm, densely white villous, 1/3 cleft anteriorly; lobes 5, unequal, ± 2-cleft, 3–5-cleft. Corolla bright red, ca. 1.6 cm; tube erect, longer than calyx; galea falcate apically; beak bent downward, straight, ca. 4 mm, slightly 2-cleft; lower lip ciliate. Anterior filament pair villous. Capsule ovoid, ca. 1.2 cm. Fl. Jul–Aug, fr. Aug–Sep.

- Abies forests; 3200–3800 m. E Xizang.

323. Pedicularis filiculiformis

假拟蕨马先蒿 jia ni jue ma xian hao

Herbs perennial, ca. 12 cm tall, glabrous, drying black. Roots numerous, fleshy. Stems 1 to several, with dense, lanceolate, membranous scales at base. Leaves mostly basal; petiole to 4 cm, glabrous; leaf blade oblong, 1.5–3 cm × 5–11 mm, abaxially white scurfy, adaxially glabrous, pinnatisect; segments 6–13 pairs, oblong, margin double dentate. Stem leaves 3 or 4, shorter petiolate and smaller than basal leaves. Inflorescences racemose, to more than 6 cm, ca. 10-flowered, centrifugal; bracts leaflike. Calyx ca. 7 mm; lobes 5,
unequal. Corolla red, with deep red galea and yellowish white throat, 2–2.2 cm; tube erect, bent at a right angle apically, 1.4–1.5 cm; beak ca. 4 mm, slightly 2-cleft apically; lower lip ca. 9 × 9 mm. Anterior filament pair pubescent. Fl. Jul, fr. Aug.

Shaded or damp places, rocky hillsides; ca. 4700 m. SE Xizang [Bhutan]. Chinese plants belong to var. filiculiformis (endemic); var. doli-chorhyncha P. C. Tsoong is endemic to Bhutan.


塔布马先蒿 ta bu ma xian hao
Herbs perennial, to 9 cm tall, drying black. Roots fleshy. Stems usually numerous, red, with 2 or 3 lines of sparse hairs. Basal leaves long petiolate, glabrous; leaf blade lanceolate-oblong, 0.7–1.5 cm × 3–5 mm, abaxially white scurfy, adaxially glabrous, pinnatifid; segments 7 or 8 pairs, crenate-dentate. Stem leaves smaller than basal leaves; segments 3–5 pairs. Inflorescences racemose, 7- or 8-flowered, centrifugal; bracts leaflike. Calyx tube ca. 5 mm, slightly cleft anteriorly, pubescent; lobes 5, unequal. Corolla red, with deeply red galea apically and white throat, 1.8–2 cm; tube ca. 1.5 cm, glabrous; galea ± bent at a right angle apically; beak bent downward, straight, 5–5.5 mm, slender; lower lip 9–10 mm × ca. 1.2 cm. Anterior filament pair slightly pubescent. Fl. Jun, fr. Jul.

• Open rocky slopes; ca. 4500 m. SE Xizang.


长喙系 chang hui xi
Stems single or few. Leaves often almost all basal. Inflorescences long spicate, centrifugal. Calyx 5-lobed. Corolla tube slightly less than 2 × as long as calyx; galea erect, more than 3 × as long as lower lip; beak long, more than 3 × as long as lower lip, slender, often S-shaped; lower lip very small.
• One species: endemic to China.


长喙马先蒿 zhuang jian ma xian hao
Herbs perennial, 15–25 cm tall, drying black. Roots fleshy. Stems usually single, puberulent. Basal leaves few; petiole 1–2 cm; leaf blade lanceolate-linear to lanceolate-oblong, 2.5–9 × 0.4–2 cm, abaxially pubescent along veins, adaxially puberulent, pinnatisect; segments 10–18 pairs, ovate-lanceolate to lanceolate, margin double dentate. Stem leaves few or absent, alternate or sometimes pseudo-opposite. Inflorescences centrifugal, 7–18 cm; bracts leaflike. Pedicel 1–3 mm. Calyx tubular, ca. 1.1 cm, ca. 1/4 cleft anteriorly, pubescent; lobes 5, equal or slightly unequal, dentate. Corolla purplish red, ca. 3.2 cm; tube erect basally, ± bent at a right angle apically, ca. 1.8 cm; galea erect; beak 1.6–1.8 cm, S-curved; lower lip shorter than galea, glabrous. Filaments pubescent. Capsule narrowly triangular-ovoid, 1.4–1.7 cm. Fl. May–Sep, fr. Sep–Oct.

• Alpine meadows, open hillsides; 3500–3800 m. NW Yunnan.


壮健系 zhuang jian xi
Herbs low, sometimes ± stemless. Leaves alternate, pinnatifid. Inflorescences racemose. Calyx 1/3 cleft anteriorly, 5-lobed. Corolla tube not or slightly longer than calyx; beak straight or ± coiled, usually downward uncinate, 2-cleft apically; lower lip large, often wider than long.
Four species: Bhutan, China, Sikkim; three species in China.
1a. Beak of corolla coiled, ca. 7.5 mm; corolla tube 2.2–3 cm; leaf blade 3.5–6 cm ....................... 328. P. garckeana
1b. Beak of corolla straight, 4–5 mm; corolla tube 1–1.6 cm; leaf blade 2–3 cm.

2a. Stems erect; leaf blade linear, segments 12–20 pairs; pedicel 25–60 mm ......................... 326. P. daltonii
2b. Stems ascending; leaf blade narrowly oblong, segments 8–10 pairs; pedicel 4–9 mm .......... 327. P. robusta


道氏马先蒿 dao shi ma xian hao
Herbs perennial, 2–6 cm tall, densely pubescent, drying ± black. Stems 2–20, erect, unbranched. Leaves alternate; petiole 2–4 cm; leaf blade linear, ca. 2.5 cm × 5 mm, pinnatifid; segments 12–20 pairs, ovate, apiculate-dentate. Inflorescences racemose, dense. Pedicel to 2.5–6 cm. Calyx 1–1.2 cm, 1/3 cleft anteriorly, densely pubescent; lobes 5, unequal, serrate. Corolla tube ca. 1.6 cm, externally puberulent; galea strongly bent apically; beak straight, ca. 5 mm, slender, bent slightly downward apically, 2-cleft at apex; lower lip 1.8–2 cm wide, lobes rounded, erose-serrulate. Filaments pubescent. Capsule obliquely oblong, ca. 2 cm × 6 mm, exceeding calyx, apiculate. Seeds ovoid. Fl. Jul–Aug, fr. Aug.
Alpine meadows; 4500–5500 m. S and SE Xizang [Bhutan, Sikkim].


壮健马先蒿 zhuang jian ma xian hao
Herbs perennial, 2–6 cm tall, densely pubescent, drying black. Stems ascending. Leaves alternate; petiole 1–2 cm; leaf blade narrowly oblong, 2–3 cm × ca. 5 mm,
Herbs perennial, 6–16 cm tall, drying black. Roots fusciform, fleshy. Stems erect, slender, leafy. Leaves alternate; petiole 2–3 cm, sheathlike, enlarged basally; leaf blade linear, 3.5–6 cm × ca. 5 mm, pinnatifid; segments 12–20 pairs, ovate, apiculate-dentate. Inflorescences centrifugal, dense. Pedicel 0.8–1.8 cm. Calyx cylindric-campanulate, hispid; tube 1.4–1.6 cm; lobes 5, unequal, serrate. Corolla purple, red, rose, or pink; tube 2.2–3 cm, externally minutely pubescent; beak of galea coiled, ca. 7.5 mm, slender; lower lip 1.8–2 cm, middle lobe oblong, smaller than lateral lobes, placed slightly apically. Filaments pubescent, anterior pair denser. Capsule obliquely oblong, ca. 2.2 cm, ca. 1/2 as long as calyx. Fl. Jul. 2n = 16.

S Xizang [Sikkim].


大花系 da hua xi

Herbs low, some stemless, pubescent. Leaves in a rosette, narrowly oblong, ± entire or mostly pinnatifid. Calyx tube very narrow, long, 2-, 3-, or 5-lobed. Corolla tube very long; galea beaked; lower lip large.

Two species: Bhutan, China, Sikkim; both species in China.

1a. Middle lobe of lower corolla lip rounded, emarginate; beak of galea straight, 5–6 mm, 2-cleft; leaves 1.5–4 cm, with segment pairs 9–30 .............................................................. 330. P. przewalskii

1b. Middle lobe of lower corolla lip oblong-ovate; beak of galea ± S-shaped, ca. 8 mm, entire; leaves 1–1.5 cm, with segment pairs 3–9 or entire ........................................................................................................ 331. P. bella


普氏马先蒿 pu shi ma xian hao

Herbs perennial, 6–12 cm tall, slightly drying black or not. Roots numerous, fascicled, ± fusiform. Stems 1–3, 1–2 cm tall or absent. Leaves mostly basally; petiole 0.1–2.5 cm, glabrous; leaf blade lanceolate-linear, 1.5–4 cm × 1.5–8 mm, adaxially glabrous to densely pubescent, sometimes glandular pubescent, pinnatifid; segments 9–30 pairs, crenate-dentate. Inflorescences centrifugal, 3- to more than 20-flowered. Calyx ca. 1.1 cm, 2/5 cleft anteriorly; lobes 2, 3, or 5, unequal, grouped posteriorly, serratate apically, long ciliate. Corolla purple-red throughout or with yellowish white throat or white to cream with purple beak; tube 3–3.5 cm, long pubescent; galea bent at a right angle apically, stout, crested or not in front; beak straight, 5–6 mm, slender, deeply 2-cleft with linear lobes, to 3 mm; lower lip deeply lobed, lobes ± equal, middle lobe rounded to emarginate.

- Alpine meadows; 4000–5300 m. S Gansu, E Qinghai, W Sichuan, S and SE Xizang, NW Yunnan.

1a. Leaf blade sparsely pubescent to glabrous adaxially .......................... 330a. subsp. przewalskii

1b. Leaf blade densely pubescent.

2a. Calyx lobes usually 2 or 3; leaf blade glandular pubescent 330d. subsp. microphyton

2b. Calyx lobes 5; leaf blade not glandular pubescent.

3a. Leaf blade ca. 1.5 cm × 5 mm; corolla purple-red throughout 330b. subsp. australis

3b. Leaf blade ca. 2.2 cm × 8 mm; corolla purple-red, except beak of galea, becoming pale when dry 330c. subsp. hirsuta

330a. Pedicularis przewalskii subsp. przewalskii

普氏马先蒿(原亚种) pu shi ma xian hao (yuan ya zhong)

Leaf blade 3–3.5 cm × 4–8 mm, sparsely pubescent to glabrous adaxially, sparsely glandular. Calyx lobes 5. Corolla purple; tube partly long pubescent or glabrous minutely glandular.

- Alpine meadows; 4000–5000 m. S Gansu, E Qinghai, W Sichuan, S Xizang.

This subspecies includes two varieties: var. przewalskii with a purple-red corolla, usually yellowish white throat, and uncrested galea; and var. cristata (H. L. Li) P. C. Tsoong with a white to cream colored corolla, a purple beak, and usually crested galea.


南方普氏马先蒿 nan fang pu shi ma xian hao


Leaf blade ca. 1.5 cm × 5 mm, densely pubescent, eglandular. Calyx lobes 5. Corolla purple-red throughout; tube long pubescent.

- Alpine meadows; 4300–4800 m. W Sichuan, SE Xizang.

This subspecies includes two varieties: var. microphyton (Bureau & Franchet) P. C. Tsoong with a purple-red galea and white to pale yellow lower lip, not ciliate; and var. purpurea (Bonati) P. C. Tsoong with a purple corolla and ciliate lower lip.


美丽马先蒿 mei li ma xian hao

Herbs annual, barely 8 cm tall, not drying black. Roots long conical, ± woody. Stems 0.1–3 cm tall, numerous, cespitose, white pubescent. Leaves mostly basal; petiole 0.5–2 cm, sheathlike dilated base, slightly pubescent; leaf blade ovate-lanceolate, 1–1.5 cm, pinnatifid or entire; segments 3–9 pairs, crenate-dentate, abaxially whitish pubescent, adaxially densely pubescent. Flowers axillary, 1–14. Pedicel 3–7 mm, densely long whitish pubescent. Calyx 1.2–1.5 cm × ca. 5 mm, densely white pubescent, 1/3 cleft anteriorly; lobes 5, unequal. Corolla dark purple throughout or some with pale yellow tube, purple galea, and white lower lip; tube 2.8–3.4 cm, pubescent; galea falcate; beak ± S-shaped, ca. 8 mm, not 2-cleft at apex; lower lip 2–2.4 cm wide, middle lobe oblong-ovate, much smaller than lateral pair. Filaments pubescent. Capsule obliquely oblong, ca. 2 × as long as calyx. Fl. Jun–Jul, fr. Jul–Sep.

Meadows, steep rocky slopes among dwarf Rhododendron, cliff faces; 3600–4900 m. S and SE Xizang [Bhutan, Sikkim].

1a. Leaf blade pinnatifid ........................... 331a. subsp. bella

1b. Leaf blade ± entire ........................... 331b. subsp. holophylla

331a. Pedicularis bella subsp. bella

美丽马先蒿(原亚种) mei li ma xian hao (yuan ya zhong)

Leaf blade pinnatifid.

- Moist meadows; 4300–4900 m. S Xizang [Bhutan, Sikkim].


金叶美丽马先蒿 quan ye mei li ma xian hao

Pedicularis bella J. D. Hooker var. holophylla Marquand & Shaw, J. Linn. Soc., Bot. 48: 211. 1929.

Leaf blade ± entire.

- Steep rocky slopes among dwarf Rhododendron, cliff faces, alpine meadows; 3600–4400 m. SE Xizang.

This subspecies includes var. holophylla with a dark purple or rarely pale red corolla, and var. cristifrons P. C. Tsoong with a pale yellow corolla tube, purple galea, and white lower lip.

长花系       chang hua xi

Herbs often low. Basal leaves often persistent, long petiolate. Stem leaves alternate, numerous, lanceolate-oblong, often pinnatifid to pinnatipartite. Inflorescences centrifugal. Calyx lobes 2, 3, or 5, unequal. Corolla tube very long, more than 2 × as long as calyx; galea beaked; lower lip spreading.

About 21 species: China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Sikkim, Tajikistan, Turkmenistan, Uzbekistan; 18 species in China.

1a. Corolla yellow throughout or with red galea and white lower lip margins, galea ± coiled but not twisted.
   2a. Corolla yellow, with red galea and white margin on lower lip; lower lip to 3 cm wide .......... 334. *P. tricolor*
   2b. Corolla usually yellow throughout; lower lip less than 2.6 cm wide.
      3a. Leaves pinnatisect; corolla tube 2.5–3 cm; calyx lobes (2 or)3 ......................... 332. *P. croizatiana*
      3b. Leaves pinnatifid to pinnatipartite, some merely undulate-lobed; corolla tube more than 4 cm; calyx lobes usually 2, some 3.
         4a. Galea crested in front; corolla tube less than 3 × as long as calyx; calyx lobes 3 .... 333. *P. cranolopha*
         4b. Galea not crested in front; corolla tube 3–10 × as long as calyx; calyx lobes usually 2.
            5a. Galea bent at a right angle, beak ca. 15 mm ..................................................... 338. *P. armata*
            5b. Galea curving gradually, beak 6–10 mm.
               6a. Lobes of lower corolla lip emarginate; beak of galea 2-cleft at apex; plants glabrescent ................................................................. 336. *P. longiflora*
               6b. Lateral lobes of lower corolla lip rounded, not emarginate; beak of galea entire at apex; plants pubescent.
                  7a. Leaves basal and on stem, leaf blade to 7 × 1.8 cm; corolla tube 4.5–5 cm; galea slightly bent apically, forming nearly a circle, beak strongly curved ..................... 335. *P. chinensis*
                  7b. Leaves basal, leaf blade ca. 5 × 1 cm; corolla tube ca. 7.5 cm; galea curving downward into a horseshoe-shape, beak nearly straight ........................................ 337. *P. bidentata*

1b. Corolla purple, with purple galea; galea twisted.
   8a. Middle lobe of lower corolla lip emarginate to deeply 2-lobed.
      9a. Beak of corolla ca. 5 mm, ± semicircular; leaves pinnatifid to pinnatipartite .................. 339. *P. latituba*
      9b. Beak of corolla 7–15 mm, usually S-shaped; leaves pinnatisect.
         10a. Calyx 5–6 mm, lobes 2; corolla tube 1–2.5 cm; plants low, with short creeping stems 341. *P. humilis*
         10b. Calyx more than 10 mm, lobes 2 or 3(–5); corolla tube more than 3 cm; plants tall or short.
            11a. Beak of galea 1–1.5 mm; all filaments pubescent .............................................. 348. *P. sigmoida*
            11b. Beak of galea to 11 mm; filaments 2 pubescent, 2 glabrous ........................... 349. *P. siphantha*

8b. Middle lobe of lower corolla lip entire, truncate, or rounded.
   12a. Corolla white, some with a purple galea.
      13a. Corolla white with purple galea ................................................................. 342. *P. variegata*
      13b. Corolla white throughout.
         14a. Corolla lobes 3–5; corolla tube 5–6 × as long as calyx; filaments 2 pubescent, 2 glabrous ................................................................. 344. *P. leptosiphon*
         14b. Calyx lobes 2; corolla tube 8–9 × as long as calyx; all filaments pubescent ..... 345. *P. paxiana*
   12b. Corolla red, rose, to purple throughout (corolla of *P. fastigiata* is rose with a deep red galea).
      15a. Calyx 12–24 mm, lobes usually 2; leaves usually pinnatifid to pinnatipartite.
         16a. Corolla tube to 12 cm; all filaments pubescent ............................................. 340. *P. decorissima*
         16b. Corolla tube 3–5 cm; filaments 2 pubescent, 2 glabrous .......................... 346. *P. dolichantha*
      15b. Calyx 7–10 mm, lobes 3; leaves pinnatisect.
         17a. Corolla tube 3.5–4 cm; beak of galea semicircular; all filaments glabrous .... 343. *P. fastigiata*
         17b. Corolla tube 8–11 cm; beak of galea S-shaped; anterior filament pair pubescent apically, others glabrescent ....................................................... 347. *P. tenuituba*


克洛氏马先蒿       ke luo shi ma xian hao

Herbs perennial, 5–21 cm tall, drying slightly black. Stems usually numerous, unbranched, ascending or procumbent, densely pubescent. Leaves alternate,
sometimes ± opposite; petiole 1–2.5 cm, pubescent; leaf blade lanceolate-linear to ± ovate-oblong, 2–4.5 cm × 5–10 mm, glabrous except for pubescent midvein, pinnatisect; segments 9–12 pairs, ovate-triangular to oblong-lanceolate, margin double dentate. Flowers axillary; bracts pubescent. Pedicel 1–1.8 mm, long pubescent. Calyx 1–1.3 cm, 1/3 cleft anteriorly, long pubescent; lobes (2 or)3, unequal, posterior one smallest, lateral pair incised-double dentate. Corolla yellow, 3.3–4 cm; tube 2.5–3 cm, sparsely pubescent; galea falcate apically, conspicuously crested in front; beak ± coiled, ca. 5 mm; lower lip 0.9–1.5 × 1.5–2.1 cm, ciliate, lobes ± equal, emarginate. Filaments densely pubescent apically. Fl. Jul–Aug, fr. Aug–Sep.

- Pinus forests; alpine meadows; 3700–4200 m. SW Sichuan, SE Xizang.


凸额马先蒿 tu e ma xian hao

Herbs perennial, 5–23 cm tall, ± pubescent, not drying black. Stems usually cespitose, spreading, unbranched, with 1 or 2 lines of hairs. Basal leaves sometimes withering early; petiole to 3 cm; leaf blade oblanceolate-lanceolate to lanceolate-linear, to 6 × 1.5 cm, pinnatisect; segments to 15 pairs, ovate to lanceolate-oblong, to 4/5 cleft anteriorly, densely long white pubescent; lobes 3, subequal to unequal, posterior ones sometimes smallest, entire, lateral pair leaflike. Corolla yellow, 4–5 cm, pubescent; tube less than 3 × as long as calyx; galea falcate apically; beak slightly semicircular, 7–8 mm; lower lip ca. 1.3 × 2 cm, densely ciliate, middle lobe emarginate. Filaments densely pubescent. Fl. Jun–Jul, fr. Aug.

- Alpine meadows; 2600–4200 m. SW Sichuan, NE Qinghai, Sichuan, NW Yunnan.

1a. Calyx tube ± reticulate veined apically, posterior lobe very small .... 333a. var. cranolopha

1b. Calyx tube not reticulate veined, posterior lobe usually larger.

2a. Crest on galea modified into a prominent, slender, attenuate process 333b. var. longicornuta

2b. Crest on galea smaller, a mere bulge, not elongated into a pointed process .................................................. 333c. var. garnieri

333a. Pedicularis cranolopha var. cranolopha

凸额马先蒿 (原变种) tu e ma xian hao (yuan bian zhong)

Calyx tube ± reticulate veined apically; posterior lobe very small.

- Alpine meadows; ca. 3800 m. SW Sichuan, NE Qinghai, N Sichuan.

333b. Pedicularis cranolopha var. longicornuta Prain, Hooker’s Icon. Pl. 23: t. 2208B. 1894.

长角凸额马先蒿 chang jiao tu e ma xian hao

Pedicularis bistrostris Bureau & Franchet.

Calyx tube not reticulate veined; posterior lobe usually large. Galea crest modified into a slender attenuate process.

- Alpine meadows; 2600–4200 m. SW Sichuan, NE Qinghai, Sichuan, NW Yunnan.


格氏凸额马先蒿 ge shi tu e ma xian hao


Calyx tube not reticulate veined; posterior lobe usually large. Galea crest short, not elongated into a prominent pointed process.

- W Sichuan.


三色马先蒿 san se ma xian hao

Herbs annual, less than 5 cm tall. Stems 1 to several, unbranched, central stem erect, outer stems procumbent, longer, glabrous. Basal leaves numerous; petiole 1.5–4 cm; leaf blade lanceolate, 2.5–4.5 × 0.7–1.2 cm, glabrous, abaxially sparsely white scurfy, pinnatifid; segments 11–14 pairs, lanceolate, incised-dentate. Stem leaves usually 2, opposite. Inflorescences racemose, to 15-flowered; bracts leaflike. Pedicel 2–8 mm, glabrous. Calyx tube ovate, 0.8–1.2 cm, to 4/5 cleft anteriorly, densely long white pubescent; lobes 3, equal, leaflike. Corolla yellow, with red galea, and white margin on lower lip; tube 3.5–5 cm, pubescent basally; galea and beak circular, ± crested, 1.5–1.7 cm; lower lip ca. 1.7 × 3 cm, glabrous, middle lobe emarginate, lateral lobes rounded or emarginate. Filaments pubescent. Fl. Aug–Sep, fr. Sep–Oct.

- Alpine meadows; 3000–3600 m. NW Yunnan.

1a. Lateral lobes of lower corolla lip rounded, not emarginate ........................................... 334a. var. tricolor

1b. All 3 lobes of lower corolla lip emarginate .................................................. 334b. var. aequiretusa

334a. Pedicularis tricolor var. tricolor

三色马先蒿 (原变种) san se ma xian hao (yuan bian zhong)

Lower corolla lip with lateral lobes rounded, not emarginate.

- Alpine meadows; 3000–3600 m. NW Yunnan.


等凹三色马先蒿 deng ao san se ma xian hao

Lower corolla lip with all 3 lobes emarginate.

- NW Yunnan.


中国马先蒿 zhong guo ma xian hao
Herbs annual, to 30 cm tall, not drying black. Stems 1 to several, erect or outer stems ascending to procumbent, sometimes branched apically, with lines of hairs or glabrescent. Leaves basal and on stem; petiole to 4 cm, distal ones shorter, long pubescent; leaf blade lanceolate-oblong to linear-oblong, to 7 × 1.8 cm, glabrous on both surfaces, pinnatifid; segments 7–13 pairs, ovate, margin double dentate. Inflorescences long racemose; bracts leaflike, densely ciliate. Pedicel to 1 cm, pubescent. Calyx tubular, 1.5–1.8 cm, densely pubescent, sometimes with purplish dots, 2/5 cleft anteriorly; lobes 2, leaflike, incised-double dentate. Corolla yellow; tube 4.5–5 cm, pubescent; galea slightly bent apically, forming nearly a circle, not crested; beak semicircular, 9–10 mm; lower lip wider than long, ca. 2 cm wide, lobes rounded, densely ciliate. Filaments densely pubescent. Capsule oblong-lanceolate, ca. 1.9 cm × 7 mm. Fl. Jul, fr. Aug.

This species includes two forms: f. chinensis with a yellow corolla and f. erubescens P. C. Tsoong with a pale purple-red corolla.

### 336. Pedicularis longiflora


**长花马先蒿 chang hua ma xian hao**

Herbs annual, 10–18 cm tall. Stems usually short, glabrescent. Basal leaves in a rosette; petiole 1–2 cm, sparsely long ciliate; leaf blade lanceolate to narrowly oblong, glabrous on both surfaces, pinnatifid to pinnatifidaparte; segments 5–9 pairs, margin double dentate. Stem leaves alternate or pseudo-opposite, with shorter petioles. Flowers axillary. Pedicel short. Calyx short. Calyx lobes 3. Corolla yellow; tube ca. 7.5 cm × 1.5 cm, base attenuate, undulate-lobed; segments 5 × 1 cm, base attenuate, undulate-lobed; segments subrounded, shallowly undulate-dentate. Flowers axillary, 2–4. Pedicel short. Calyx cylindric, ca. 1.5 cm, with reticulate veins; lobes 2, elliptic, ca. 5 mm, incised-serrate. Corolla yellow; tube ca. 7.5 cm × 1.5 mm, more than 4 × as long as calyx, pubescent; galea curving downward into a horseshoe-shape; beak nearly straight, ca. 7 mm, ca. as long as galea; lower lip ca. 1.7 × 2.5 cm, middle lobe rounded, ca. 6 × 8 mm, ca. 1/3 as large as lateral lobes. Filaments red pubescent.

- Alpine meadows; 1700–2900 m. C and S Gansu, Hebei, Nei Mongol, NE Qinghai, Shaanxi, Shanxi.

* This species includes two forms: f. chinensis with a yellow corolla and f. erubescens P. C. Tsoong with a pale purple-red corolla.

### 336a. Pedicularis longiflora var. longiflora

**管状长花马先蒿 guan zhuang chang hua ma xian hao**

**Pedicularis tubiformis**

Herbs 6–8 cm tall, gray pubescent throughout. Roots fusiform, slender. Stems nearly absent, tufted. Leaves basal; petiole to 3–3.5 cm; leaf blade linear-oblong, ca. 5 × 1 cm, base attenuate, undulate-lobed; segments subrounded, shallowly undulate-dentate. Flowers axillary, 2–4. Pedicel short. Calyx cylindric, ca. 1.5 cm, with reticulate veins; lobes 2, elliptic, ca. 5 mm, incised-serrate. Corolla yellow; tube ca. 7.5 cm × 1.5 mm, more than 4 × as long as calyx, pubescent; galea curving downward into a horseshoe-shape; beak nearly straight, ca. 7 mm, ca. as long as galea; lower lip ca. 1.7 × 2.5 cm, middle lobe rounded, ca. 6 × 8 mm, ca. 1/3 as large as lateral lobes. Filaments red pubescent.


* This species includes two forms: f. chinensis with a yellow corolla and f. erubescens P. C. Tsoong with a pale purple-red corolla.

### 336b. Pedicularis longiflora var. tubiformis

**Klotzsch in Klotzsch & Garcke, Bot. Ergebn. Reise Waldemar 106. 1877.**

**二齿马先蒿 er chi ma xian hao**

Herbs annual, to 30 cm tall, not drying black. Stems 1 to several, erect or outer stems ascending to procumbent, sometimes branched apically, with lines of hairs or glabrescent. Leaves basal and on stem; petiole to 4 cm, distal ones shorter, long pubescent; leaf blade lanceolate-oblong to linear-oblong, to 7 × 1.8 cm, glabrous on both surfaces, pinnatifid; segments 7–13 pairs, ovate, margin double dentate. Inflorescences long racemose; bracts leaflike, densely ciliate. Pedicel to 1 cm, pubescent. Calyx tubular, 1.5–1.8 cm, densely pubescent, sometimes with purplish dots, 2/5 cleft anteriorly; lobes 2, leaflike, incised-double dentate. Corolla yellow; tube 4.5–5 cm, pubescent; galea slightly bent apically, forming nearly a circle, not crested; beak semicircular, 9–10 mm; lower lip wider than long, ca. 2 cm wide, lobes rounded, densely ciliate. Filaments densely pubescent. Capsule oblong-lanceolate, ca. 1.9 cm × 7 mm. Fl. Jul, fr. Aug.

- Alpine meadows; 1700–2900 m. C and S Gansu, Hebei, Nei Mongol, NE Qinghai, Shaanxi, Shanxi.

* This species includes two forms: f. chinensis with a yellow corolla and f. erubescens P. C. Tsoong with a pale purple-red corolla.

### 336c. Pedicularis longiflora var. yingshanensis


**阴山长花马先蒿 yin shan chang hua ma xian hao**


* This species includes two forms: f. chinensis with a yellow corolla and f. erubescens P. C. Tsoong with a pale purple-red corolla.

### 337. Pedicularis bidentata

**Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 32: 533. 1888.**

**二齿马先蒿 er chi ma xian hao**

Herbs 6–8 cm tall, gray pubescent throughout. Roots fusiform, slender. Stems nearly absent, tufted. Leaves basal; petiole to 2–3.5 cm; leaf blade linear-oblong, ca. 5 × 1 cm, base attenuate, undulate-lobed; segments subrounded, shallowly undulate-dentate. Flowers axillary, 2–4. Pedicel short. Calyx cylindric, ca. 1.5 cm, with reticulate veins; lobes 2, elliptic, ca. 5 mm, incised-serrate. Corolla yellow; tube ca. 7.5 cm × 1.5 mm, more than 4 × as long as calyx, pubescent; galea curving downward into a horseshoe-shape; beak nearly straight, ca. 7 mm, ca. as long as galea; lower lip ca. 1.7 × 2.5 cm, middle lobe rounded, ca. 6 × 8 mm, ca. 1/3 as large as lateral lobes. Filaments red pubescent.

- Alpine meadows; 1700–2900 m. C and S Gansu, Hebei, Nei Mongol, NE Qinghai, Shaanxi, Shanxi.

极丽马先蒿  ji li ma xian hao
Herbs perennial, to 15 cm tall, drying dark brown.
Stems usually several, densely tufted, outer stems usually procurcent to ascending, longer than central stem. Leaves basal and on stem; petiole 1–3(–6) cm, ± long pubescent; leaf blade linear to lanceolate-oblong, 2–7 × ca. 1.4 cm, glabrous except finely pubescent along midvein adaxially, usually pinnatifid; segments 6–9 pairs, triangular to triangular-ovate, margin double dentate. Stem leaves sometimes pseudo-opposite. Flowers axillary. Pedicil short. Calyx more than 2 cm, densely long pubescent, ca. 1/2 cleft anteriorly; lobes 2, shallowly pinnatifid. Corolla rose-pink; tube to 12 cm, sparsely pubescent; galea slightly twisted, densely pubescent at middle, prominently crested in front; beak curved below; lower lip to 2.8 cm wide, long ciliate, rounded. Filaments densely pubescent. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine meadows; 2900–3500 m. SW Gansu, E Qinghai, W Sichuan.


矮马先蒿 ai ma xian hao
Herbs perennial, low, with 5–15 cm stems. Roots numerous, fusiform. Stems numerous, creeping, slightly branched or unbranched, glabrescent. Basal leaf petiole ca. 2 mm, glabrous; leaf blade ca. 1.5 cm × 7–10 mm, pinnatisect; segments 5 or 6 pairs, ovate, pinnatifid, incised-dentate. Stem leaves alternate or rarely ± opposite, similar to basal leaves but smaller and shorter petiolate; bracts leaflike. Flowers axillary, few. Pedicel erect, 3–10 mm, glabrous. Calyx 5–6 mm, membranous, puberulent when young, glabrescent, deeply cleft anteriorly; lobes 2, palmately cleft distally, ciliate. Corolla rose; tube 1–2.5 cm, pubescent; galea twisted basally, glandular pubescent, slightly crested; beak S-shaped, slender, 7–8 mm; lower lip 9–10 mm × ca. 1.5 cm, lobes emarginate, densely ciliate. Filaments 2 pubescent, 2 glabrous. Fl. Jul, fr. Aug.

• Alpine meadows; 3000–3100 m. NW Yunnan.
pubescent, inconspicuously crested; beak S-shaped, 9–10 mm; lower lip 8–9 mm × 1.8–1.9 cm, minutely ciliate, middle lobe ca. 1/3 as long as lateral lobes or smaller, entire, truncate or rounded. Anterior filament pair sparsely pubescent apically. Fl. Aug. fr. Sep.

- Swampy meadows; 4100–4200 m. SW Sichuan, Yunnan.


帝状马先蒿  zhou zhuang ma xian hao

Herbs ca. 30 cm tall. Stems erect, unbranched, glabrescent, striate, leafy throughout. Proximal leaves alternate, distal ones ± opposite; petiole long, glabrous; leaf blade linear, ca. 1 cm wide, abaxially sparsely white scurfy, pinnatisect; segments lanceolate, serrulate. Flowers axillary, proximal ones widely spaced, distal ones dense and fastigiate; sessile. Calyx ovate-oblong, ca. 1 cm, deeply cleft anteriorly; lobes 3, leaflike. Corolla rose, with a deep red galea; tube 3.5–4 cm, slender, minutely pubescent; galea twisted, narrowly crested; beak semicircular; lower lip ca. 1 cm wide, middle lobe ca. 1/2 as large as lateral lobes, rounded. Filaments glabrous.

- NW Yunnan.


纤管马先蒿  xian guan ma xian hao

Herbs perennial, to 20 cm tall. Stems numerous, erect, unbranched, glabrescent; leaf blade oblong or linear-oblong, to 3.5 × 1.1 cm, pinnatisect; segments 8–11 pairs, widely spaced, ovate, becoming glabrous or sparsely pubescent, dentate. Proximal flowers axillary, distal ones dense, ± sessile; bracts leaflike. Calyx ca. 1 cm × 3 mm, sparsely long pubescent, deeply cleft anteriorly; lobes 3–5, unequal, posterior-lateral pair largest, pinnatifid. Corolla white; tube erect, slender, 6.5–7.5 cm × ca. 1 mm; galea strongly twisted, 9–10 mm, glandular pubescent; beak S-shaped; lower lip ca. 8 mm × 1.7 cm, finely ciliate, middle lobe truncate. Anterior filament pair sparsely pubescent apically. Fl. Jul, fr. Aug.

- Alpine meadows; ca. 4000 m. SW Sichuan, Yunnan.


派氏马先蒿  pai shi ma xian hao

Herbs perennial, low, mostly stemless. Roots fleshy, fascicled. Leaves basal, barely in a rosette, glabrous; petiole flat, winged; leaf blade ca. 10 × 1 cm, pinnatisect; segments semirounded, crenate-dentate. Calyx campanulate, white woolly, 2-lobed. Corolla white; tube 8–9(–10) × as long as calyx; galea twisted, circular; lobes of lower lip with rounded lateral lobes, very large. Filaments pubescent. Stigma long exserted.

- About 4300 m. W Sichuan.


疏花马先蒿  shu hua ma xian hao

Herbs perennial, 15–30 cm tall, drying slightly black. Roots fleshy. Stems single, erect, unbranched, sparsely long pubescent. Basal leaves withering early. Stem leaves numerous, alternate, pubescent; petiole 1.5–4 cm, narrowly winged, ciliate; leaf blade linear to oblong, 2.5–6 × ca. 1 cm, pinnatisect or pinnatifid; segments 10–18 pairs, ovate or triangular, incised-dentate. Flowers axillary. Pedicel erect, ca. 5 mm, slender. Calyx cylindric, 1.2–1.8 cm, papery, scabrous pubescent, deeply cleft anteriorly, usually 2-lobed, pinnatifid to ± palmately lobed. Corolla rose; tube 3–5 cm, pubescent; galea strongly twisted, narrowly crested, glabrous; beak S-shaped, ca. 1 cm, slender; lower lip ciliate, middle lobe entire, ± rounded. Filaments 2 pubescent, 2 glabrous. Fl. Jul–Aug. fr. Sep.

- Meadow, beside ponds; ca. 3200 m. E Yunnan.


狭管马先蒿  xia guan ma xian hao

Herbs perennial, to 30 cm tall. Stems numerous, unbranched, glabrous or sparsely long pubescent. Leaves basal and on stem; petiole to 4 cm, narrowly winged, long pubescent; leaf blade oblong or linear, ca. 9 × 1.6 cm, glabrescent or sparsely pubescent, pinnatisect; segments 10–15 pairs, ovate, dentate. Stem leaves alternate, rarely ± opposite, similar to basal leaves but slightly smaller. Flowers axillary, proximal ones lax, ± sessile or short pedicellate. Calyx cylindric, 7–8 mm, deeply cleft anteriorly; lobes 3, unequal. Corolla purple; tube slender, erect, 8–11 cm × 6–8 mm, glabrous or sparsely pubescent; galea strongly twisted, inconspicuously crested, glandular pubescent; beak S-shaped, 8–10 mm; lower lip 8–9 mm × 1.4–1.6 cm, ciliate, middle lobe truncate. Anterior filament pair sparsely pubescent apically. Capsule oblong, ca. 1.7 cm × 6 mm. Fl. Jul–Aug. fr. Aug.

- Alpine meadows; 3000–3200 m. SW Sichuan, Yunnan.


之行喙马先蒿  zhi xing hui ma xian hao

Herbs perennial, to 30 cm tall. Stems numerous, unbranched, glabrous or sparsely long pubescent. Basal leaves and on stem; petiole to 4 cm, narrowly winged, long pubescent; leaf blade oblong or linear, ca. 9 × 1.6 cm, glabrescent or sparsely pubescent, pinnatisect; segments 10–15 pairs, ovate, dentate. Stem leaves alternate, rarely ± opposite, similar to basal leaves but slightly smaller. Flowers axillary, proximal ones lax, ± sessile or short pedicellate. Calyx cylindric, 7–8 mm, deeply cleft anteriorly; lobes 3, unequal. Corolla purple; tube slender, erect, 8–11 cm × 6–8 mm, glabrous or sparsely pubescent; galea strongly twisted, inconspicuously crested, glandular pubescent; beak S-shaped, 8–10 mm; lower lip 8–9 mm × 1.4–1.6 cm, ciliate, middle lobe truncate. Anterior filament pair sparsely pubescent apically. Capsule oblong, ca. 1.7 cm × 6 mm. Fl. Jul–Aug. fr. Aug.

- Alpine meadows; 3000–3200 m. SW Sichuan, Yunnan.


之行喙马先蒿  zhi xing hui ma xian hao

Herbs perennial, to 30 cm tall, stout, drying slightly black. Stems numerous, central one erect, outer stems procumbent to ascending, usually longer, striate, ± pubescent. Leaves mostly on stem, usually pseudo-opposite to pseudo-whorled; proximal petioles to 2.5 cm, narrowly winged, pubescent; leaf blade ovate-lanceolate to linear-lanceolate, to 5 × 1.6 cm, abaxially sparsely long pubescent along veins, densely gray scurfy throughout, adaxially pubescent, pinnatisect;
segments 5–11 pairs, ovate to lanceolate, pinnatifid, incised double dentate. Inflorescences 2/3–5/6 as long as stems; flowers numerous, dense apically; bracts leaflike. Calyx ca. 1.6 cm, ca. 1/2 cleft anteriorly, pubescent; lobes 3, pinnatifid to ± palmately lobed, posterior one smallest. Corolla purple-red; tube slender, 3.2–5.5 cm × ca. 1.2 mm, densely pubescent; galea strongly twisted apically; beak bent upward, S-shaped, to 1–1.5 cm; lower lip 1.8–2.4 cm wide, densely ciliate, middle lobe shallowly 2-lobed. Filaments densely pubescent. Fl. Aug–Sep, fr. Sep–Oct.

- Open stony pastures; 3000–3600 m. NW Yunnan.


管花马先蒿 guan hua ma xian hao

Herbs perennial, low to tall. Roots to 7 cm, usually cylindric. Stems single and ± erect, or sometimes numerous and outer stems procumbent, striate, glabrescent. Leaves basal and on stem; petiole to 3.5 cm, winged, glabrescent or sparsely long pubescent; leaf blade lanceolate-oblong to linear-oblong, rarely ovate-elliptic, 1–6 × 0.7–1.6 cm, abaxially sparsely long pubescent along midvein, adaxially sparsely pubescent, pinnatisect; segments 6–15 pairs, somewhat lanceolate to broadly ovate or triangular, pinnatifid, or double dentate. Flowers axillary, dense; bracts leaflike, glabrescent or long ciliate. Calyx pubescent; tube to 1.2 cm, 1/3 cleft anteriorly; lobes 2(or 3 or 5), posterior one smallest. Corolla rose-red; tube 4–7 cm, finely pubescent; galea strongly twisted apically, with or without a conspicuously auriculate protrusion; beak semicircular or slightly S-shaped, to 1.1 cm, slender; lower lip 1.1–1.5 × 1.5–1.8 cm, lobes emarginate or shallowly 2-lobed. Anterior filament pair pubescent. Capsule ovoid-oblong. Fl. Jun–Jul, fr. Jul–Aug. 2n = 16.

Alpine meadows, swampy places; 3000–4600 m. W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, India, Nepal, Sikkim].

1a. Auriculate protrusion of galea conspicuous; calyx lobes 2(or 3); roots ± cylindric or sometimes slightly fusiform .......................... 349a. var. siphonantha

1b. Auriculate protrusion of galea inconspicuous or nearly absent; calyx lobes usually 5; roots usually strongly fusiform .................................. 349b. var. delavayi

349a. Pedicularis siphonantha var. siphonantha 管花马先蒿（原变种） guan hua ma xian hao (yuan bian zhong)

Roots ± cylindric or sometimes slightly fusiform. Calyx lobes 2(or 3). Galea with conspicuous auriculate protrusion.

Alpine meadows, swampy places; 3500–4500 m. S and SE Xizang [Bhutan, India, Nepal, Sikkim].


Roots usually strongly fusiform. Calyx lobes usually 5. Galea with inconspicuous auriculate protrusion or nearly none.

- Alpine moist meadows; 3000–4600 m. W Sichuan, NW Yunnan.
dots, 2/3 cleft anteriorly; tube to 8–9 mm; lobes 5, unequal, long white ciliate. Corolla yellow, with brown-red or purple beak or corolla red throughout; tube ± erect, 1.5–3.8 cm, pubescent; galea falcate apically; beak semicircular, to 1 cm; lower lip ca. 2 × 2.5 cm, middle lobe obcordate, emarginate or ligulate, not placed apically. Filaments pubescent or anterior pair densely villous and posterior pair glabrous. Fl. Jul–Aug, fr. Aug–Sep.

Grassy slopes, among **Rhododendron**, alpine meadows, thickets; 3800–4600 m. SE and SW Xizang [Bhutan, Myanmar].

1a. Corolla red throughout, mainly yellow with purple beak or red galea, or yellow with a red beak; corolla tube ca. 1.5 cm; middle lobe of lower lip obcordate. Filaments pubescent. 

350a. **Pedicularis megalochila** var. *megalochila*

**大唇马先蒿(原变种) da chun ma xian hao (yuan bian zhong)**

Corolla red throughout, mainly yellow with purple beak or red galea, or yellow with a red beak; corolla tube ca. 1.5 cm; middle lobe of lower lip obcordate. Filaments pubescent.

Grassy slopes, among **Rhododendron**, ca. 4200 m. SE and SW Xizang [Bhutan, Myanmar].

This variety includes two forms; f. *megalochila* with a yellow corolla but with a red beak, and f. *rhododantha* P. C. Tsoong with an entirely red corolla.

1b. Corolla yellow with brown-red galea; corolla tube to 3.8 cm; middle lobe of lower lip ligulate; anterior filament pair densely villous, posterior pair glabrous. 

350b. var. *ligulata*

**舌状大唇马先蒿 she zhuang da chun ma xian hao**

Corolla yellow with brown-red galea; tube to 3.8 cm; middle lobe of lower lip ligulate. Anterior filament pair densely villous, posterior pair glabrous.

- Alpine meadows, thickets; 4200–4300 m. SE Xizang.


**中甸马先蒿 zhong dian ma xian hao**

Herbs perennial, ca. 10 cm tall. Roots filiform, ± fusiform, slightly fleshy. Stems usually 3–5 cespitose, ca. 1 cm tall or nearly rudimentary. Basal leaves in a rosette; petiole ca. 1 cm, densely ciliate; leaf blade ovate-oblong to oblong, 1–2.5 cm, abaxially white scurfy, adaxially glabrescent, pinnatisect; segments 4–14 pairs, ovate-oblong, dentate. Flowers axillary. Pedicel ca. 2 mm. Calyx ca. 2 cm, densely white villous, 1/2 cleft anteriorly; lobes 5, unequal, leaflike. Corolla yellow, ca. 6.5 cm; tube 5–6.5 cm, pubescent; galea nearly falcate; beak curved to reflexed, 5–6 mm; lower lip usually enveloping galea, 1.5–1.8 × 2.5–3 cm, ciliate. Anterior filament pair pubescent. Fl. Aug, fr. Sep.

•*Pinus* forests on slopes; ca. 3300 m NW Yunnan.

352. **Pedicularis megalantha** D. Don, Prodr. Fl. Nepal. 94. 1825.

**硕花马先蒿 shuo hua ma xian hao**

Herbs annual, (6–)45 cm tall, not drying black. Roots fibrous. Stems cespitose or single, glabrescent. Basal leaves usually withering early. Stem leaves few; petiole 4–6 cm; leaf blade linear-oblong, 5–7 × 2–3.5 cm, abaxially sparsely white scurfy, adaxially sparsely puberulent, pinnatisect; segments 7–12 pairs, oblong-ovate to triangular-lanceolate, sinuate-dentate. Inflorescences centrifugal, to more than 30 cm; bracts leaflike. Pedicel 5–12 mm. Calyx oblong, pubescent, less than 1/3 cleft anteriorly; lobes 5, unequal. Corolla usually red-rose; tube 3–6 cm, 2–4 × as long as calyx; galea bent at a right angle apically; beak circular, 1.2–1.4 cm; lower lip completely enveloping galea, 2.5–3.5 cm wide, ciliate. Anterior filament pair pubescent. Capsule ovoid-lanceolate, ca. 3 cm × 9 mm. Fl. June–Aug, fr. Jul–Sep. 2n = 16.

Swampy places at forest margins, damp grassy slopes; 2300–4200 m. S and SE Xizang [Bhutan, India (Darjeeling), Nepal, Pakistan, Sikkim].
Additional Entities Described from China
The following (reportedly in Xinjiang) are of uncertain status in China so they are listed here for convenience: *Pedicularis maximowiczii* Krassnow, *P. albertii* Regel, and *P. chorgossica* Regel & Winkler (see Novon 7: 373–375. 1998); also *P. geniculata* T. Yamazaki, *P. karakorumiana* T. Yamazaki, and *P. mustanghatana* T. Yamazaki (see J. Jap. Bot. 68(3): 142–148. 1993).