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中国翠雀花属修订 (二) *

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A revision of the genus *Delphinium* (Ranunculaceae) of China (II)

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组 2. 密花翠雀花组

Sect. **Elatopsis** Huth in Bull. Herb. Boiss. 1: 330. 1893; et in Bot. Jahrb. 20: 391. 1895; Nevski in Kom. Fl. URSS 7: 123. 1937; W. T. Wang in Acta Bot. Sin. 10(1): 75. 1962; et in Fl. Reip. Pop. Sin. 27: 356. 1979; Tamura in Sci. Rep. Osaka Univ. 15: 33. 1966; in Acta Phytotax. Geobot. 91: 100. 1990; et in Hiepk., Nat. Pflanzenfam., Zwei. Aufl. 17aIV: 295. 1995, p. p. excl. Subsect. *Aconitoides*; W. T. Wang & M. J. Warnock in Fl. China 6: 234. 2001. Lectotype: *Delphinium elatum* L.

Sect. *Delphinastrum* auct. non DC.; Malyutin

in Bot. Zhurn. 72: 688. 1987.

叶 3 浅裂或 3 深裂, 稀 3 全裂。花序总状或伞房状。萼片蓝色或紫色, 上萼片常船形, 比距长或短。花瓣呈黑色或褐色。退化雄蕊黑色或褐色; 瓣片通常 2 浅裂, 腹面基部之上被黄色, 稀白色茸毛。心皮 3~5 (~10)。种子四面体形, 沿纵棱具狭翅, 稀倒卵球形, 具横向排列的小鳞片或长椭圆体形, 周围具 1 狭翅。

80 余种, 隶属于 3 亚组, 广布于亚洲和欧洲的温带和寒温带地区。我国有 3 亚组的 75 种, 广布于西南、西北、北部和东北部。

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分种和变种检索表

1. 花序总状。

2. 萼片多宿存,较大,具明显脉纹,有较密柔毛,上萼片常具短距。

3. 萼距比萼片短。

4. 叶片 3 全裂;萼距尾形,长 6 mm,粗 0.6 mm 21. 短尾翠雀花 *Delphinium brachyurum*

4. 叶片非 3 全裂;萼距细圆锥形或近筒形,粗 3~10 mm。

5. 叶片 3 浅裂;萼片长 14~17 mm,距筒状圆锥形,长 11~13 mm
..... 28. 浅裂翠雀花 *D. vestitum*

5. 叶片 3 深裂。

6. 花极密集,组成圆柱形或近球形总状花序。

7. 茎疏被柔毛,无黄色腺毛;全部叶 3 深裂;总状花序有 30~40 朵花;萼片长 28~30 mm,距长 8~10 mm 26. 密花翠雀花 *D. densiflorum*

7. 茎被柔毛和黄色腺毛;基生叶和下部茎生叶 3 深裂,上部茎生叶 3 全裂;花序有 15 花;萼片长 20 mm,距长 7~8 mm 27. 普兰翠雀花 *D. pulanense*

6. 花不极密集,花序不呈圆柱形或近球形。

8. 复总状花序。

9. 花梗无腺毛;上萼片长 20~27 mm,距长 10~15 mm,基部粗 8~10 mm
..... 30. 克什米尔翠雀花 *D. cashmerianum*

9. 花梗有腺毛。

10. 花梗长 5~10 cm;上萼片长 26 mm,内面有毛,距长 14 mm,基部粗 8 mm;
心皮 3 29. 粘毛翠雀花 *D. viscosum*

10. 花梗长 2~4 cm;上萼片 17 mm,内面无毛,距长 12~15 mm,基部粗 3.5 mm;
心皮 3~4 31. 塔序翠雀花 *D. pyramidale*

8. 简单总状花序。

11. 小苞片船状披针形;心皮 3 29. 粘毛翠雀花 *D. viscosum*

11. 小苞片平,不呈船形;心皮(3~)4~5(~10)。

12. 茎和花梗被柔毛和黄色腺毛;叶裂片互相覆压;子房有毛
..... 22. 迭裂翠雀花 *D. nordhagenii*

13. 叶牙齿宽卵形,顶端微尖 22a. 模式变种 var. *nordhagenii*

13. 叶牙齿宽三角形,顶端急尖 22b. 尖齿翠雀花 var. *acutidentatum*

12. 茎和花梗无黄色腺毛;叶裂片互相邻接;心皮 4~5,无毛。

14. 花梗长 4~10 mm;萼距长 4 mm;心皮 4 ... 23. 四果翠雀花 *D. tetragynum*

14. 花梗长 15~75 mm;萼距长 6~15 mm;心皮 4~5。

15. 叶片和叶柄均有毛;总状花序所有苞片均叶状,轴和花梗有腺毛;萼片长
14~16 mm,距长 6~7 mm;退化雄蕊瓣片被黄色髯毛;心皮无毛
..... 24. 塔什库尔干翠雀花 *D. taxkorganense*

15. 叶片和叶柄均无毛；总状花序基部苞片叶状，上部苞片不分裂，条形，轴和花梗无腺毛；萼片长 20~40 mm，距长 14~15 mm；退化雄蕊瓣片被白色髯毛；子房顶端被柔毛 25. 乔戈里峰翠雀花 *D. qiaogeliense*
3. 萼距与萼片近等长或比萼片长。
16. 种子近四面体形，沿纵棱具狭翅；叶片 3 深裂，稀 3 全裂；退化雄蕊裂片 2 浅裂，稀不分裂。
17. 叶片 3 深裂或 3 浅裂；退化雄蕊瓣片 2 浅裂；心皮 3。
18. 萼距与萼片近等长；花梗无腺毛。
19. 萼片披针形，顶端长渐狭；总状花序简单，长 20~25 cm 37. 扎囊翠雀花 *D. zhanangense*
19. 萼片不呈披针形，顶端不长渐狭。
20. 复总状花序；萼片长 16~20 mm，距长 19 mm 35. 喜山翠雀花 *D. stapeliosum*
20. 简单总状花序。
21. 小苞片狭长圆形或匙状长圆形，长 9~11 mm；子房被短柔毛；萼片长 12~14 mm 32. 匙苞翠雀花 *D. subspathulatum*
21. 小苞片披针状条形，长 3~6 mm；心皮无毛；萼片长 14~17 mm 33. 厚叶翠雀花 *D. crassifolium*
18. 萼距比萼片长。
22. 茎被腺毛；退化雄蕊瓣片被黄色髯毛。
23. 叶片 3 浅裂至叶片中部，两面被柔毛和黄色腺毛；总状花序有 8 花；萼片长 11~14 mm 36. 朗孜翠雀花 *D. nangziense*
23. 叶片 3 深裂超过叶片中部，两面疏短柔毛，无腺毛；总状花序有 15~20 花；萼片长 18~19 mm 38. 毛茛叶翠雀花 *D. hillcoatiae*
24. 萼距长 20~25 mm；心皮无毛 38a. 模式变种 var. *hillocatiae*
24. 萼距长 15~17 mm；子房被柔毛 38b. 毛果毛茛叶翠雀花 var. *pilocarpum*
22. 茎无腺毛；退化雄蕊瓣片被白色髯毛；叶片 3 浅裂；萼片长 12 mm 34. 甘肃翠雀花 *D. kansuense*
25. 花序轴和花梗被贴伏短柔毛 34a. 模式变种 var. *kansuense*
25. 花序轴和花梗被开展短柔毛 34b. 展毛甘肃翠雀花 var. *villosiusculum*
17. 叶片 3 全裂；退化雄蕊瓣片近圆形，不分裂；心皮 4~5；萼片长 12 mm，距长 22 mm 39. 磨顶山翠雀花 *D. motingshanicum*
16. 种子狭椭圆体形，长 1.8 mm，周围具一宽 0.4~0.8 mm 的狭翅；叶片 3 全裂；退化雄蕊瓣片圆扇形，不分裂 40. 门源翠雀花 *D. menyuanense*
2. 萼片脱落，稀宿存，多较小，无脉纹，不被密毛；上萼片多与距近等长。
26. 叶片 3 深裂。
27. 小苞片船形 87. 船苞翠雀花 *D. naviculare*
28. 茎被长硬毛；花梗、萼片外面和心皮无毛 87a. 模式变种 var. *naviculare*

28. 茎、花梗和萼片外面均被黄色短腺毛;子房被短柔毛 87b. 毛果船苞翠雀花 var. **lasiocarpum**
27. 小苞片平,不呈船形。
29. 花梗无毛。
30. 茎有毛;叶片下面密被短柔毛;萼片外面被短柔毛;子房密被淡黄色短柔毛 82. 新源翠雀花 **D. mollifolium**
30. 茎有毛;叶片下面疏被短柔毛;萼片外面无毛;心皮无毛。
31. 茎下部疏被短柔毛;小苞片条状丝形;萼距长 18 mm,萼片长 12~14 mm 90. 新疆高翠雀花 **D. sinoelatum**
31. 茎下部被长硬毛;小苞片狭披针形或条形。
32. 总状花序具 5~12 花;萼距与萼片近等长或比萼片稍短;种子沿纵棱有狭翅 ... 77. 伊犁翠雀花 **D. iliense**
32. 总状花序具 (12~) 18~25 花;萼距比萼片长;种子密生小鳞片 96. 东北高翠雀花 **D. korshinskyanum**
29. 花梗有毛。
33. 花梗有黄色腺毛或黄色腺点。
34. 花梗有黄色短腺毛。
35. 小苞片生花梗近基部,倒卵形;萼片外面无毛;心皮无毛;种子密生小鳞片 95. 宽苞翠雀花 **D. maackianum**
35. 小苞片生花梗中部或上部,披针形、条形或钻形;萼片外面有毛。
36. 心皮无毛。
37. 花序轴被短柔毛和黄色短腺毛;萼距与萼片等长 81. 绢毛翠雀花 **D. elatum** var. **sericum**
37. 花序轴无毛或只有黄色短腺毛;萼距比萼片长 ... 89. 萨乌尔翠雀花 **D. shawurens**
38. 花序轴无毛;萼片蓝色 89a. 模式变种 var. **shawurens**
38. 花序轴只被黄色短腺毛;萼片白色 ... 89b. 白花萨乌尔翠雀花 var. **albiflorum**
36. 子房密被短柔毛。
39. 植株高 30~40 cm;小苞片条形;退化雄蕊瓣片被白色髯毛 91. 昆仑翠雀花 **D. kunlunshanicum**
39. 植株高 150 cm;小苞片条状钻形;退化雄蕊瓣片被黄色髯毛 89c. 赛塔城翠雀花 **D. shawurens** var. **pseudoaemulans**
34. 花梗和萼片外面有黄色腺点。
40. 植株高 15 cm;茎疏被硬毛;萼片比距稍短 92. 喀什翠雀花 **D. kaschgaricum**
40. 植株高 60 cm;茎被绒毛和黄色短腺毛;萼片与萼距等长 85. 新塔翠雀花 **D. tarbagataicum**
33. 花梗无黄色腺毛或黄色腺点。

- 41. 茎无毛 84. 无腺翠雀花 *D. eglandulosum*
- 41. 茎有毛。
 - 42. 叶和花序密被开展硬毛 86. 文采翠雀花 *D. wentsaii*
 - 42. 叶和花序不密被开展硬毛。
 - 43. 小苞片宽 2~3 mm。
 - 44. 小苞片椭圆状卵形或卵形；种子具密集小鳞片 93. 长卵苞翠雀花 *D. ellipticoovatum*
 - 44. 小苞片狭披针形、狭长圆形或披针状条形。
 - 45. 小苞片距花 2~6 mm；雄蕊无毛；心皮 3~4 ... 83. 和丰翠雀花 *D. sauricum*
 - 45. 小苞片距花 1.5 mm 或与花邻接；雄蕊花丝有疏柔毛。
 - 46. 叶的中央 1 回裂片宽菱形。
 - 47. 茎和花梗被柔毛；萼距长 12~13 mm，基部粗 5~6 mm；雄蕊无毛 78. 吉隆翠雀花 *D. jilongense*
 - 47. 茎被硬毛；花梗被短糙伏毛和少数开展硬毛；萼距长 14 mm，基部粗 2.2 mm；雄蕊花丝有疏毛 79. 中尼翠雀花 *D. tabatae*
 - 46. 叶的中央 1 回裂片楔状倒梯形；花梗只被短糙伏毛；萼距钻状筒形，基部粗 3.5~4.5 mm 80. 温泉翠雀花 *D. winklerianum*
 - 43. 小苞片宽 1.2 mm 以下，狭条形或钻形。
 - 48. 萼片外面被短柔毛和少数黄色腺毛，比距稍长；花序轴和花梗被开展微硬毛 76. 乌恰翠雀花 *D. wuqiaense*
 - 48. 萼片外面无黄色腺毛。
 - 49. 花序轴、花梗和萼片外面密被贴伏短柔毛 94. 天山翠雀花 *D. tianshanicum*
 - 49. 花序轴和花梗被开展微硬毛。
 - 50. 基生叶 1 或 3，茎生叶 4 或 6；总状花序长 3~6.5 cm，有 3 或 7 花；上萼片比距稍长。
 - 50'. 基生叶 1，茎生叶 6，叶片上面无毛；总状花序长 3 cm，有 3 花 74. 阿克陶翠雀花 *D. actoense*
 - 50'. 基生叶 3，茎生叶 4，叶片上面被微硬毛；总状花序长 6.5 cm，有 7 花 75. 昭苏翠雀花 *D. zhaosuense*
 - 50. 基生叶 6~8，茎生叶 0 或 2；总状花序长 12~28 cm，有 12 花；上萼片与距等长或比距稍短 88. 镔锂翠雀花 *D. zhangii*
 - 26. 叶片 3 全裂 97. 全裂翠雀花 *D. trisectum*
 - 1. 花序伞房状，或花单朵顶生。
 - 51. 萼片比萼距长；种子近四面体形，沿纵棱具翅或无翅。
 - 52. 心皮 4~5。

53. 叶片基部突然呈楔形;茎被柔毛和黄色腺毛;萼距基部粗 6~9 mm 41. 囊距翠雀花 *D. brunonianum*
53. 叶片基部不突然呈楔形;茎无毛。
54. 叶片 3 深裂。
55. 花序轴和花梗无黄色腺毛;心皮 4 42. 帕米尔翠雀花 *D. lacostei*
55. 花序轴和花梗密被柔毛和黄色短腺毛;心皮 5 43. 叶城翠雀花 *D. yechengense*
54. 叶片 3 全裂。
56. 叶全裂片无柄;萼片蓝色或紫色。
57. 花 2~3 朵组成伞房花序;花梗被柔毛和稀疏黄色短腺毛;萼片长 17~25 mm,距长 8 mm 44. 定结翠雀花 *D. dingjieense*
57. 花单朵顶生;花梗无黄色腺毛;萼片长 16~18 mm,距长 13 mm 47. 珠峰翠雀花 *D. chumulangmaense*
56. 叶全裂片有柄。
58. 叶全裂片的柄长 1~6 mm;伞房花序有 (1~)2~3 花;萼片蓝紫色,上萼片长 30 mm,距长 7~10 mm,基部粗 5 mm;退化雄蕊瓣片被白色髯毛,裂片宽三角形;子房无毛 45. 申扎翠雀花 *D. shenzhaense*
58. 叶全裂的柄长 10~17 mm;伞房花序有 1~2 花;萼片白色,上萼片长 22 mm,距长 19 mm,基部粗 4 mm;退化雄蕊瓣片被黄色髯毛,裂片狭三角形 46. 拟冰川翠雀花 *D. pseudoglaciale*
52. 心皮 3。
59. 叶片 3 深裂,稀 3 半裂。
60. 茎被短柔毛和黄色短腺毛..... 29b. 黄粘毛翠雀花 *D. viscosum* var. *chrysotrichum*
60. 茎无黄色腺毛。
61. 叶片 3 半裂;心皮只在腹缝线上有毛,其他部分无毛 48. 堆拉翠雀花 *D. wardii*
61. 叶片 3 深裂超过叶片中部;子房密被毛。
62. 茎和叶柄被贴伏短柔毛;花梗也被贴伏短柔毛,无黄色腺毛;萼距比萼片短。
63. 叶片基部心形;小苞片与花离开,叶状或宽椭圆形;上萼片船形;退化雄蕊瓣片近卵形,2 浅裂 50. 察瓦龙翠雀花 *D. tsarongense*
63. 叶片基部近截形;小苞片与花邻接,条状披针形;上萼片开展;退化雄蕊瓣片扁圆形,不分裂 49. 唐古特翠雀花 *D. tanguticum*
62. 茎和叶柄被开展短柔毛;花梗密被开展短柔毛,疏被黄色短腺毛;萼距比萼片短或与萼片等长 51. 黄毛翠雀花 *D. chrysotrichum*
59. 叶片 3 全裂。
64. 花 3 朵组成伞房花序。
65. 植株高 15 cm;萼片黄色,上萼片长 19 mm,距长 12 mm,基部粗 2~5 mm;雄蕊花丝有疏毛 52. 石滩翠雀花 *D. pseudocandelabrum*

65. 植株高 5~10 cm; 萼片紫色, 上萼片长 18~25 mm, 距长 10~15 mm, 基部粗 2.5~5 mm; 雄蕊花丝无毛 55. 细茎翠雀花 *D. nortonii*

64. 花单朵顶生。

66. 退化雄蕊瓣片 2 半裂; 萼片长 18~27 mm。

67. 叶片下面被短柔毛; 萼片内面有毛 53. 唐古拉翠雀花 *D. tangkulaense*

68. 萼片蓝紫色 53a. 模式变型 f. *tangkulaense*

68. 萼片黄色 53b. 库塞翠雀花 f. *xanthanthum*

67. 叶片下面无毛; 萼片紫色, 内面无毛 55. 细茎翠雀花 *D. nortonii*

66. 退化雄蕊瓣片不分裂; 萼片长 12~16 mm 54. 仲巴翠雀花 *D. chungbaense*

51. 萼片与距近等长或比距短。

69. 种子近四面体形, 沿纵棱具狭翅或无翅。

70. 萼片与距近等长。

71. 叶片 3 深裂。

72. 植株高 10~15 cm; 萼片长 23~25 mm, 距长 20~23 mm; 种子具不明显纵棱, 无翅
..... 56. 川滇翠雀花 *D. smithianum*

72. 植株高 20~50 cm; 萼片长 18~22 mm; 种子具纵棱, 沿棱具狭翅
..... 57. 宽萼翠雀花 *D. pseudopulcherrimum*

71. 叶片 3 全裂。

73. 植株高 (10~) 20~55 cm; 花梗被柔毛和黄色腺毛; 萼片长 16~24 mm, 距长 21~24 mm; 心皮 5; 种子沿纵棱无翅 58. 大通翠雀花 *D. pylzowii*

73. 植株高 10 cm; 花梗无黄色腺毛; 萼片长 12~15 mm, 距长 12~14 mm; 心皮 3; 种子沿纵棱具宽翅 60. 青海翠雀花 *D. qinghaiense*

70. 萼片比距短。

74. 叶片 3 深裂。

75. 小苞片与花邻接 61. 巴塘翠雀花 *D. batangense*

75. 小苞片与花分开。

76. 萼片长 20~22 mm, 距长 35~38 mm 62. 软叶翠雀花 *D. malacophyllum*

76. 萼片长 13~19 mm, 距长 16~22 (~25) mm。

77. 萼片边缘白色, 长 13~17 mm, 距长 16~22 mm; 退化雄蕊瓣片 2 半裂, 被黄色髯毛
..... 63. 白缘翠雀花 *D. chenii*

77. 萼片边缘不呈白色, 长 17~26 mm; 退化雄蕊瓣片被白色髯毛。

78. 小苞片条形, 全缘或具 1 小裂片; 萼距长 17~21 mm; 花瓣顶端全缘; 退化雄蕊瓣片全部黑色, 顶端微凹 64. 竞生翠雀花 *D. yangii*

78. 小苞片椭圆状卵形, 不分裂或 3 浅裂; 萼距长 25 mm; 花瓣顶端微凹; 退化雄蕊瓣片顶部褐色, 其他部分黑色 65. 雪宝顶翠雀花 *D. xuebaodingense*

74. 叶片 3 全裂。

79. 小苞片与花分开;植株高 6~30 cm。

80. 植株高 15~30 cm;叶片宽 2.2~4 cm。

81. 花梗密被短柔毛和短腺毛 59. 三果翠雀花 *D. trigynum*

81. 花梗无腺毛。

82. 植株高 15 cm;伞房花序具 3 花;小苞片叶状,长 10 mm,3 全裂;萼片蓝紫色,长 14~15 mm,距长 17 mm 66. 美叶翠雀花 *D. calophyllum*

82. 植株高 28~30 cm;伞房花序有 4~5 花;小苞片不为叶状,不分裂,呈狭倒披针形或条形;萼片在边缘呈白色,长 11~12 mm,距长 20~24 mm 67. 雅江翠雀花 *D. yajiangense*

80. 植株高约 6 cm;叶片宽 1~2 cm。

83. 叶的末回裂片卵形;花 1 (~2) 朵顶生;萼片长 18~25 mm,萼距长 22~30 mm;花瓣顶端全缘 68. 单花翠雀花 *D. monanthum*

83. 叶的末回裂片条状披针形;花 3~6 朵顶生;萼片长 15~18 mm,距长 20~21 mm;花瓣顶端微凹 69. 奇林翠雀花 *D. candelabrum*

79. 小苞片与花邻接,椭圆形或披针形;植株高 15~40 (~70) cm;萼片长 12~15 mm,距长 15~22 mm 70. 川陕翠雀花 *D. henryi*

69. 种子具密集小鳞片。

84. 叶片 3 深裂;萼片与距近等长。

85. 花梗长 2~3.5 cm;小苞片钻形,长 2~3.5 mm;萼片长 15~22 mm,距长 17~22 mm;心皮 4~5 71. 灵宝翠雀花 *D. lingbaoense*

85. 花梗长 3~12 cm;小苞片匙状条形,长 6~14 mm;萼片长 14~25 (~30) mm,距长 17~25 (~33) mm;心皮 3 72. 白蓝翠雀花 *D. albocoeruleum*

86. 花梗密被短柔毛,无黄色腺毛 72a. 模式变种 var. *albocoeruleum*

86. 花梗密被短柔毛和黄色短腺毛 72b. 贺兰翠雀花 var. *przewalskii*

84. 叶片 3 全裂;萼片比距短 73. 细须翠雀花 *D. siwanense*

87. 花梗被短柔毛和黄色短腺毛 73a. 模式变种 var. *siwanense*

87. 花梗只被短柔毛,无黄色腺毛 73b. 冀北翠雀花 var. *albopuberulum*

Key to species and varieties

1. Inflorescences racemose.

2. Sepals mostly persistent, larger, veinous, more or less densely hairy, upper sepal often with a short spur.

3. Sepal spur shorter than sepals.

4. Leaf blades 3-sect; sepal spur tail-like, small, 6 mm long, 0.6 mm across 21. *Delphinium brachyurum*

4. Leaf blades not 3-sect; sepal spur subulate or subtubular, 3~10 mm across.

5. Leaf blades 3-lobed; sepals 14–17 mm long, spur tubular-conic, 11–13 mm long 28. **D. vestitum**
5. Leaf blades 3-parted.
6. Flowers very dense, in terete or subglobose racemes.
7. Stems sparsely pubescent, lacking yellow glandular hairs; leaves all 3-parted; racemes 30–40-flowered; sepals 28–30 mm long 26. **D. densiflorum**
7. Stems pubescent and yellow-glandular-puberulous; basal and lower cauline leaves 3-parted, upper cauline leaves 3-sect; racemes 15-flowered; sepals 20 mm long, spur 7–8 mm long 27. **D. pulanense**
6. Flowers not dense, and racemes not terete or subglobose.
8. Racemes compound.
9. Pedicels lacking glandular hairs; upper sepal 20–27 mm long, spur 10–15 mm long, at base 8–10 mm across 30. **D. cashmerianum**
9. Pedicels with glandular hairs.
10. Pedicels 5–10 cm long; upper sepal 26 mm long, inside hairy, spur 14 mm long, at base 8 mm across; carpels 3 29. **D. viscosum**
10. Pedicels 2–4 cm long; upper sepal 17 mm long, inside glabrous, spur 10–15 mm long, at base 3.5 mm across; carpels 3–4 31. **D. pyramidale**
8. Racemes simple.
11. Bracteoles navicular-lanceolate; carpels 3 29. **D. viscosum**
11. Bracteoles flat, not navicular; carpels (3–) 4–5 (–10).
12. Stems and pedicels pubescent and with yellow glandular hairs; leaf lobes imbricate among themselves; carpels (3–) 5 (–10) 22. **D. nordhagenii**
13. Leaf teeth broad-ovate, at apex slightly acute 22a. **nordhagenii**
13. Leaf teeth broad-triangular, at apex acute 22b. var. **acutidentatum**
12. Stems lacking yellow glandular hairs; leaf lobes contiguous with themselves; carpels 4–5.
14. Pedicels 4–10 mm long; sepal spur 4 mm long; carpels 4 23. **D. tetragynum**
14. Pedicels 4–10 mm long; sepal spur 6–15 mm long; carpels 4–5.
15. Leaf blades and petioles hairy; raceme bracts all foliaceous, rachis and pedicels with glandular hairs; sepals 14–16 mm long, spur 6–7 mm long; staminode limbs yellow-barbate; carpels glabrous 24. **D. taxkorganense**
15. Leaf blades and petioles glabrous; basal bract of raceme foliaceous, other bracts undivided, linear, and rachis with pedicels lacking glandular hairs; sepals 20–24 mm long, spur 14–15 mm long; staminode limbs white-barbate; ovaries on apex pubescent 25. **D. qiaogeliense**

3. Sepal spur nearly as long as sepals or longer than them.
 16. Seeds subtetrahedral, along longitudinal edges narrow-winged; leaf blades 3-parted, rarely 3-sect; staminode limbs 2-lobed; carpels 3.
 17. Leaf blades 3-parted; staminode limbs 2-lobed; carpels 3.
 18. Sepal spur nearly as long as sepals; pedicels lacking glandular hairs.
 19. Sepals lanceolate, at apex long attenuate; racemes simple, 20–25 cm long 37. **D. zhanangense**
 19. Sepals not lanceolate, at apex not attenuate.
 20. Racemes compound; sepals 18–20 mm long, spur 19 mm long 35. **D. stapeliosum**
 20. Racemes simple.
 21. Bracteoles narrow-oblong or spatulate-oblong, 9–11 mm long; ovaries puberulous; sepals 12–14 mm long 32. **D. subspathulatum**
 21. Bracteoles lanceolate-linear, 3–6 mm long; carpels glabrous; sepals 14–17 mm long 33. **D. crassifolium**
 18. Sepal spur longer than sepals.
 22. Stems with glandular hairs; staminode limbs yellow-barbate.
 23. Leaf blades 3-lobed to the middle of blade, on both surfaces pubescent and glandular-puberulous; racemes 8-flowered; sepals 11–14 mm long 36. **D. nangziense**
 23. Leaf blades 3-parted exceeding the middle of blade, on both surfaces sparsely puberulous, lacking glandular hairs; racemes 15–20-flowered; sepals 18–19 mm long ... 38. **D. hillcoatiae**
 24. Sepal spur 20–25 mm long; carpels glabrous 38a. var. **hillcoatiae**
 24. Sepal spur 15–17 mm long; ovaries pubescent 38b. var. **pilocarpum**
 22. Stems lacking glandular hairs; staminode limbs white-barbate; leaf blades 3-lobed; sepals 12 mm long 34. **D. kansuense**
 25. Raceme rachis and pedicels appressed-puberulous 34a. var. **kansuense**
 25. Raceme rachis and pedicels spreading-puberulous 34b. var. **villosiusculum**
 17. Leaf blades 3-sect; staminode limbs suborbicular, undivided; carpels 4–5; sepals 12 mm long, spur 22 mm long 39. **D. motingshanicum**
 16. Seeds narrow-ellipsoidal, 1.8 mm long, peripherally with a narrow wing 0.4–0.8 mm broad; leaf blades 3-sect; staminode limbs orbicular-flabellate undivided 40. **D. menyuanense**
2. Sepals deciduous, rarely persistent, mostly smaller, not veinous, not densely hairy; upper sepal nearly as long as spur.
 26. Leaf blades 3-parted.
 27. Bracteoles navicular 87. **D. naviculare**
 28. Stems hirsute; pedicels, sepals and carpels glabrous 87a. var. **naviculare**
 28. Stems, pedicels and sepals abaxially yellow-glandular-puberulous; ovaries puberulous 87b. var. **lasiocarpum**

- 27. Bracteoles flat, not navicular.
- 29. Pedicels glabrous.
 - 30. Stems glabrous; leaf blades abaxially densely puberulous; sepals outside puberulous; ovaries densely yellowish-puberulous 82. **D. mollifolium**
 - 30. Stems hairy; leaf blades abaxially sparsely puberulous; sepals outside glabrous.
 - 31. Stems below sparsely puberulous; bracteoles linear-filiform; sepal spur 18 mm long, sepals 12–14 mm long 90. **D. sinoelatum**
 - 31. Stems below hirsute; bracteoles narrow-lanceolate or narrow-linear.
 - 32. Racemes 5–12-flowered; sepal spur as long as or shorter than sepals; seeds along longitudinal edges narrow-winged 77. **D. iliense**
 - 32. Racemes (12–) 18–25-flowered; sepal spur longer than sepals; seeds densely squamulose 96. **D. korshinskyanum**
- 29. Pedicels hairy.
 - 33. Pedicels with yellow glandular hairs or yellow glandular dots.
 - 34. Pedicels yellow-glandular-puberulous.
 - 35. Bracteoles situated near base of pedicel, obovate; sepals outside glabrous; carpels glabrous; seeds densely squamulose 95. **D. maackianum**
 - 35. Bracteoles situated on the middle or upper part of pedicel, lanceolate, linear or subulate; sepals outside hairy.
 - 36. Carpels glabrous.
 - 37. Raceme rachis puberulous and yellow-glandular-puberulous; sepal spur as long as sepals 81. **D. elatum** var. **sericeum**
 - 37. Raceme rachis glabrous or only yellow-glandular-puberulous; sepal spur longer than sepals 89. **D. shawurense**
 - 38. Raceme rachis glabrous; sepals blue 89a. var. **shawurense**
 - 38. Raceme rachis only yellow-glandular-puberulous; sepals white 89b. var. **albiflorum**
 - 36. Ovaries densely puberulous.
 - 39. Herbs 30–40 cm tall; bracteoles linear; staminal limbs white-barbate 91. **D. kunlunshanicum**
 - 39. Herbs 150 cm tall; bracteoles linear-subulate; staminal limbs yellow-barbate 89c. **D. shawurense** var. **pseudoaemulans**
 - 34. Pedicels and sepals outside yellow-glandular-punctate.
 - 40. Herbs 15 cm tall; stems sparsely hispid; sepals slightly shorter than spur 92. **D. kaschgaricum**
 - 40. Herbs 60 cm tall; stems tomentose and yellow-glandular-puberulous; sepals as long as spur 85. **D. tarbagataicum**
 - 33. Pedicels lacking yellow glandular hairs or yellow glandular dots.

41. Stems glabrous 84. **D. eglandulosum**
41. Stems hairy.
42. Racemes with very dense flowers, terete or subglobose; stems, leaves and racemes all densely hispid 86. **D. wentsaii**
42. Racemes not with dense flowers; leaves and racemes not densely hispid.
43. Bracteoles 2–3 mm broad.
44. Bracteoles elliptic-ovate or ovate; seeds densely squamulose 93. **D. ellipticoovatum**
44. Bracteoles narrow-lanceolate, narrow-oblong or lanceolate-linear.
45. Bracteoles 2–6 mm remote from flower; stamen filaments glabrous; carpels 3–4 83. **D. sauriceum**
45. Bracteoles 1.5 mm remote from flower or contiguous with flower; stamen filaments sparsely pilose.
46. Leaf primary central lobe broad-rhombic.
47. Stems and pedicels pubescent; sepal spur 12–13 mm long, at base 5–6 mm across; stamens glabrous 78. **D. jilongense**
47. Stems hispid; pedicels strigillose and sparsely hispid; sepal spur 14 mm long, at base 2.2 mm across; stamen filaments sparsely pilose 79. **D. tabatae**
46. Leaf primary central lobe cuneate-obtrapeziform; pedicels only strigillose; sepal spur subulate-tubular, at base 3.5–4.5 mm across ... 80. **D. winklerianum**
43. Bracteoles less than 1.2 mm broad, narrow-linear or subulate.
48. Sepals outside puberulous and sparsely yellow-glandular-puberulous, slightly longer than spur; raceme rachis and pedicels spreading hirtellous 76. **D. wuqianense**
48. Sepals outside not yellow-glandular-puberulous.
49. Raceme rachis, pedicels and sepals outside densely appressed-puberulous 94. **D. tianshanicum**
49. Raceme rachis and pedicels spreading hirtellous.
50. Basal leaves 1 or 3, cauline leaves 4 or 6; racemes 3–6.5 cm long, 3-or 7-flowered; upper sepal slightly longer than spur.
- 50'. Basal leaf 1, cauline leaves 6, blades adaxially glabrous; racemes 3 cm long, 3-flowered; bracteoles 4 mm long 74. **D. actoense**
- 50'. Basal leaves 3, cauline leaves 4, blades adaxially hirtellous; racemes 6.5 cm long, 7-flowered; bracteoles 6–8 mm long 75. **D. zhaosuense**
50. Basal leaves 6–8, cauline leaves 0 or 2; racemes 12–28 cm long, 12-flowered; upper sepal as long as or slightly shorter than spur 88. **D. zhangii**
26. Leaf blades 3-sect 97. **D. trisectum**

1. Inflorescences corymbose, or flowers solitary and terminal.

51. Sepals longer than spur; seeds subtetrahedral, along longitudinal edges winged or wingless.

52. Carpels 4–5.

53. Leaf blade bases abruptly cuneate; stems pubescent and yellow-glandular-pubescent; sepal spur at base 6–9 mm across 41. **D. brunonianum**

53. Leaf blade bases not abruptly cuneate; stems not yellow-glandular-pubescent.

54. Leaf blades 3-parted.

55. Corymb rachis and pedicels lacking yellow glandular hairs; carpels 4 ... 42. **D. lacostei**

55. Corymb rachis and pedicels densely pubescent and yellow-glandular-puberulous; carpels 5 43. **D. yechengense**

54. Leaf blades 3-sect.

56. Leaf segments sessile; sepals blue or purple.

57. Flowers 2–3 in corymb; pedicels pubescent and sparsely yellow-glandular-puberulous; sepals 17–25 mm long, spur 8 mm long 44. **D. dingjieense**

57. Flowers solitary and terminal; pedicels lacking yellow glandular hairs; sepals 16–18 mm long, spur 13 mm long 47. **D. chumulangmaense**

56. Leaf segments stipitate.

58. Segment stipes 1–6 mm long; corymbs (1–) 2–3-flowered; sepals blue-purple, upper sepal 30 mm long, spur 7–10 mm long, at base 5 mm across; staminode limbs white-barbate, lobes broad-triangular; ovates glabrous 45. **D. shenzhaense**

58. Segment stipes 10–17 mm long; corymbs 1–2-flowered; sepals white, upper sepal 22 mm long, spur 19 mm long, at base 4 mm across; staminode limbs yellow-barbate, lobes narrow-triangular 46. **D. pseudoglaciale**

52. Carpels 3.

59. Leaf blades 3-parted, rarely 3-cleft.

60. Stems puberulous and yellow-glandular-puberulous ... 29b. **D. viscosum** var. **chrysotrichum**

60. Stems lacking yellow glandular hairs.

61. Leaf blades 3-cleft; carpels only on ventral sutures hairy 48. **D. wardii**

61. Leaf blades 3-parted exceeding the middle of blade; ovaries densely hairy.

62. Stems and petioles appressed puberulous; pedicels also appressed-puberulous, lacking yellow glandular hairs; sepals spur shorter than sepals.

63. Leaf blades at base cordate; bracteoles remote from flower, foliaceous or broad-elliptic; upper sepal cymbiform; staminode limbs subovate, 2-lobed 50. **D. tsarongense**

63. Leaf blades at base subtruncate; bracteoles contiguous with flower, linear-lanceolate; upper sepal opened; staminode limbs depressed-orbicular, undivided 49. **D. tanguticum**

62. Stems and petioles spreading-puberulous; pedicels densely spreading-puberulous, sparsely yellow-glandular-puberulous; sepal spur shorter than or as long as sepals 51. **D. chrysotrichum**

59. Leaf blades 3-sect.

64. Flowers 3 in corymb.

65. Herbs 15 cm tall; sepals yellow, upper sepal 19 mm long, spur 12 mm long, at base 2.5 mm across; stamen filaments sparsely pilose 52. **D. pseudocandelabrum**

65. Herbs 5–10 cm tall; sepals purple, upper sepal 18–25 mm long, spur 10–15 mm long at base 2.5–5 mm across; filaments glabrous 55. **D. nortonii**

64. Flowers solitary and terminal

66. Staminode limbs 2-cleft; sepals 18–27 mm long.

67. Leaf blades abaxially puberulous; sepals inside hairy 53. **D. tangkulaense**

68. Sepals blue-purple 53a. f. **tangkulaense**

68. Sepals yellow 53b. f. **xanthanthum**

67. Leaf blades abaxially glabrous; sepals inside glabrous 55. **D. nortonii**

66. Staminode limbs undivided; sepals 12–16 mm long 54. **D. chungbaense**

51. Sepals nearly as long as or shorter than sepals.

69. Seeds subtetrahedral, along longitudinal edges winged or wingless.

70. Sepals nearly as long as spur.

71. Leaf blades 3-parted.

72. Herbs 10–15 cm tall; sepals 23–25 mm long, spur 20–23 mm long; seeds with inconspicuous longitudinal edges, wingless 56. **D. smithianum**

72. Herbs 20–50 cm tall; sepals 18–24 mm long, spur 18–22 mm long; seeds with longitudinal edges, and along edges narrow-winged 57. **D. pseudopulcherrimum**

71. Leaf blades 3-sect.

73. Herbs (10–)20–55 cm tall; pedicels pubescent and yellow-glandular-pubescent; sepals 16–24 mm long, spur 21–24 mm long; carpels 5; seeds along longitudinal edges wingless 58. **D. pylzowii**

73. Herbs 10 cm tall; pedicels lacking yellow glandular hairs; sepals 12–15 mm long, spur 12–14 mm long; carpels 3; seeds along longitudinal edges broad-winged 60. **D. qinghaiense**

70. Sepals shorter than spur.

74. Leaf blades 3-parted.

75. Bracteoles contiguous with flower 61. **D. batangense**

75. Bracteoles remote from flower.

76. Sepals 20–22 mm long, spur 35–38 mm long 62. **D. malacophyllum**

76. Sepals 13–19 mm long, spur 16–22 mm long.

77. Sepals on margin white, 13–17 mm long, spur 16–22 mm long; staminode limbs 2-cleft, yellow-barbate 63. **D. chenii**
77. Sepals on margin not white, 17–26 mm long; staminode limbs white-barbate.
78. Bracteoles linear, entire or 1-lobulate; sepal spur 17–21 mm long; petal apex entire; staminode limbs entirely black 64. **D. yangii**
78. Bracteoles elliptic-ovate, undivided or 3-lobed; sepal spur 25 mm long; petal apex emarginate; staminode limbs at apex brown, elsewhere black 65. **D. xuebaodingense**
74. Leaf blades 3-sect.
79. Bracteoles remote from flower; herbs 6–30 cm tall.
80. Herbs 15–30 cm tall; leaf blades 2.2–4 cm broad.
81. Pedicels densely puberulous and glandular-puberulous 59. **D. trigynum**
81. Pedicels lacking glandular hairs.
82. Herbs 15 cm tall; corymbs 3-flowered; bracteoles foliaceous, 10 mm long, 3-sect; sepals on margin not white, 14–15 mm long, spur 17 mm long 66. **D. calophyllum**
82. Herbs 28–30 cm tall; corymbs 4–5-flowered; bracteoles not foliaceous, undivided, narrow-oblongate or linear; sepals on margin white, 11–12 mm long, spur 20–24 mm long 67. **D. yajiangense**
80. Herbs ca. 6 cm tall; leaf blades 1–2 cm broad.
83. Leaf ultimate lobes ovate; flowers 1(–2) terminal; sepals 18–25 mm long, spur 22–30 mm long; petal apex entire 68. **D. monanthum**
83. Leaf ultimate lobes linear-lanceolate; flowers 3–6 terminal; sepals 15–18 mm long, spur 20–21 mm long; petal apex emarginate 69. **D. candelabrum**
79. Bracteoles contiguous with flower, elliptic or lanceolate; herbs 15–40(–70) cm tall; sepals 12–15 mm long, spur 15–22 mm long 70. **D. henryi**
69. Seeds densely squamulose.
84. Leaf blades 3-parted; sepals nearly as long as spur.
85. Pedicels 2–3.5 cm long; bracteoles subulate, 2–3.5 mm long; sepals 15–22 mm long, spur 17–22 mm long; carpels 4–5 71. **D. lingbaoense**
85. Pedicels 3–12 cm long; bracteoles spatulate-linear, 6–14 mm long; sepals 14–25(–30) mm long, spur 17–25(–33) mm long; carpels 3 72. **D. albocoeruleum**
86. Pedicels puberulous, lacking yellow glandular hairs 72a. var. **albocoeruleum**
86. Pedicels puberulous and yellow-glandular-puberulous 72b. var. **przewalskii**
84. Leaf blades 3-sect; sepals shorter than spur 73. **D. siwanense**
87. Pedicels puberulous and yellow-glandular-puberulous 73a. var. **siwanense**
87. Pedicels densely puberulous, lacking yellow glandular hairs 73b. var. **albopuberulum**