# Flora of China

*Cucurbitaceae through Valerianaceae with Annonaceae and Berberidaceae*

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Volume 19

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The *Flora of China* logo (above) is a composite image, derived from the outlines of leaf shapes from genera of woody plants occurring in both China and the U.S.A., that symbolizes the collaboration between the two nations. It was designed by Charles P. Reay.



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# Flora of China

## *Cucurbitaceae through Valerianaceae with Annonaceae and Berberidaceae*

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# Preface

Volume 19 of the *Flora of China* is the 20th of the 24 text volumes in the series. It includes 22 families, 255 genera, and 2,024 species, among which 11 genera and 1,065 species (53%) are endemic to China, and 24 genera and 64 species (3%) are introduced to China. The final two families in this volume, Annonaceae and Berberidaceae, were originally scheduled for inclusion in vol. 7 (2008).

Volume 19 is formatted in the same manner as the first 19 volumes of the series: vol. 17 (1994), vol. 16 (1995), vol. 15 (1996), vol. 18 (1998), vol. 4 (1999), vol. 24 (2000), vol. 8 (2001), vol. 6 (2001), vol. 9 (2003), vol. 5 (2003), vol. 14 (2005), vol. 22 (2006), vol. 13 (2007), vol. 12 (2007), vol. 11 (2008), vol. 7 (2008), vol. 25 (2009), vol. 10 (2010), and vol. 23 (2010). The following 18 accompanying volumes of the *Flora of China Illustrations* have been published to date: vol. 17 (1998), vol. 16 (1999), vol. 15 (2000), vol. 18 (2000), vol. 4 (2001), vol. 24 (2002), vol. 8 (2003), vol. 6 (2003), vol. 9 (2004), vol. 5 (2004), vol. 14 (2006), vol. 22 (2007), vol. 13 (2008), vol. 12 (2008), vol. 11 (2009), vol. 7 (2009), vol. 25 (2010), and vol. 10 (2011).

Bruce Bartholomew edited the Acanthaceae, Annonaceae, Goodeniaceae, Lentibulariaceae, Myoporaceae, Phrymaceae, Plantaginaceae, and Stylidiaceae. Anthony R. Brach co-authored and edited the Berberidaceae (except *Berberis*) and Carlemanniaceae and edited the Adoxaceae, Berberidaceae (*Berberis*), Caprifoliaceae, Diervillaceae, Dipsacaceae, Linnaeaceae, Morinaceae, and Valerianaceae. Lisa J. Pepper edited the Rubiaceae. Nicholas J. Turland co-authored and edited the Pentaphragmataceae and Sphenocleaceae and, together with Anthony R. Brach, edited the Campanulaceae and Cucurbitaceae. Nicholas J. Turland checked the nomenclature. Lisa J. Pepper carried out the final editing of the whole volume. Zhang Libing (张丽兵) corrected errors and omissions in the Chinese and pinyin names. Anthony R. Brach, Han Xuezhe (韩学哲), Lisa J. Pepper, and Zeng Jianfei (曾建飞) proofread the volume. Nicholas J. Turland and Lisa J. Pepper compiled the indexes. Beth Parada helped with the production of the introductory pages. Rosemary Tanaka typeset the volume for publication.

The 21st and 22nd text volumes in the series (vols. 20 and 21) will be devoted to the Asteraceae (Compositae), with ca. 2,300 species.

Wu Zhengyi (吴征镒)
Peter H. Raven
Hong Deyuan (洪德元)

# Introduction

The *Flora of China* will be published in 24 volumes of text and will account for all known vascular plants of China. The taxa treated in the Flora include all native and naturalized plants, as well as economically important exotics, such as crops or plantation plants. Each text volume will be followed by an accompanying volume of the *Flora of China Illustrations,* which will provide detailed line drawings of approximately 60% of the species treated in the text volumes. A list of the volumes published to date is provided at the end of this book. An introductory volume will complete the Flora.

The Flora generally follows the same sequence of families as in *Flora Reipublicae Popularis Sinicae* (FRPS), i.e., a modified Englerian system that treats the monocotyledons last. However, the circumscription of some families reflects the present understanding of the groups. For example, the Menyanthaceae and Gentianaceae are both recognized, instead of combining them as the Gentianaceae, whereas the Lythraceae, Punicaceae, and Sonneratiaceae are combined as the Lythraceae. Genera and species are arranged taxonomically, or occasionally alphabetically.

Taxonomic treatments are presented from the level of family to species and infraspecific ranks. Although intermediate ranks (e.g., subfamily, tribe, subgenus, section, series) are useful in the taxonomy of certain large families (e.g., Poaceae) and genera (e.g., *Rhododendron*), they are used only sparingly. Accepted names are cited with authors, bibliographic citations, and synonyms, except above the rank of genus when only the name is cited. Each recognized taxon has a description as well as an indication of the number of subordinate taxa and the distribution worldwide. For infraspecific taxa, either subspecies or varieties are recognized. Forms are not treated. All keys are dichotomous, indented, and generally artificial.

The synonymy given is based on close examination of accepted names and synonyms listed in major East Asian floras. At the generic level, synonyms widely used in the literature are included. At the specific and infraspecific levels, only the main synonyms, especially those listed in the floras of neighboring countries, are included. All names based on Chinese material are included. The complete bibliographic citation of synonyms is given only for basionyms or replaced synonyms of accepted names; only the authors' names are provided for other synonyms. The basionym of an accepted name is listed before other synonyms, which are arranged alphabetically. As far as possible, the bibliographic citations of all accepted names and their basionyms have been verified. Names not validly published or misapplied in major East Asian and local Chinese floras are not included in synonymy. Discussions relating to such names are dealt with as notes. Differences of opinion among authors in the circumscription of taxa are mentioned as notes.

Except where no material was available to authors and collaborators, all descriptions are based on Chinese plants. In general, the description of a given taxon does not exceed 130 words. Descriptions of families are followed by the number of genera and species, distribution, and usually other comments, including reference to FRPS accounts. If a species is represented in China by more than one infraspecific taxon, a full description is provided for the species, and only diagnostic features are listed under the infraspecific taxa. If only one infraspecific taxon of a species occurs in China, a full description is given under the infraspecific taxon. Flowering (fl.) and fruiting (fr.) times are usually given by month using the first three letters of the month.

If a single measurement is used, it indicates length. When both length and width are used, the measurements are given as length × width. A range of measurements is separated by an en-dash (–). Discontinuous

states within a taxon are separated by the word "or." Exceptional measurements or character states are in parentheses ( ) or, when applicable only to material from outside of China, in brackets [ ].

The distribution in China is given at the provincial level, listed alphabetically as follows: Anhui, Beijing, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Taiwan, Tianjin, Xinjiang, Xizang, Yunnan, and Zhejiang. Distributions may also include the special districts of Hong Kong and Macau, but only if the taxon is absent from Guangdong Province. The provincial map is provided on the front- and endpapers of this volume. The distributions are sometimes modified by using the directions C(entral), E(ast), N(orth), S(outh), W(est), or intermediate directions. A taxon endemic to China is marked with a bullet (•) at the beginning of the paragraph on habitat and distribution. Where a taxon is very local, the exact distribution may be given in parentheses. However, localities are not given below the level of *xian* (equivalent to county) or mountain. Elevations are rounded off to the nearest 100 m.

The distribution by country, continent, or area is given alphabetically in brackets [ ] for taxa extending beyond China. Only the countries adjacent to China are explicitly listed, as well as the other countries of tropical Asia from India eastward. These include Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Laos, Malaysia, Mongolia, Myanmar (formerly Burma), Nepal, Pakistan, Papua New Guinea, the Philippines, Russia, Singapore, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan, and Vietnam. When the distribution extends beyond these countries, a generalized range (including Africa, SW Asia, Australia, Europe, North America, the Pacific islands, and South America) is given.

Whenever available, somatic chromosome numbers are included at the end of descriptions of specific and infraspecific taxa; an asterisk (*) indicates counts made from Chinese material.

A question mark (?) placed immediately before a synonym, character state in a description, or territory within a distribution indicates that confirmation is required.

Each recognized taxon in the *Flora of China* has one Chinese name, followed by its pinyin transliteration. Three indexes are included at the end of each volume: one for Chinese plant names, another for the pinyin transliterations, and the third for scientific names.

The family names of authors of plant names are written out in full. When it is necessary to use initials to differentiate authors with the same family name, the initials (if any) of the abbreviation published by Brummitt and Powell in *Authors of Plant Names* (Royal Botanic Gardens, Kew, 1992) and its continuously updated on-line supplement (at http://www.ipni.org/) are used. The abbreviation "f." is not used for the Latin *filius,* but the son's initials are used (e.g., "J. D. Hooker" rather than "Hook. f."), except when the names of the parent and descendant are identical (e.g., "Linnaeus" and "Linnaeus f.").

Abbreviations of periodicals are according to Bridson's *BPH-2* (*Botanico-Periodicum-Huntianum,* ed. 2; Pittsburgh: Hunt Institute for Botanical Documentation, 2004), and abbreviations for books follow Stafleu and Cowan's *Taxonomic Literature,* ed. 2 (*TL-2*; Utrecht/Antwerpen: Bohn, Scheltema and Holkema; The Hague/Boston: dr. W. Junk b.v., 1976–1988) and its supplements. Books and periodicals not included in these two works are abbreviated according to the recommendations in the Appendix of *BPH-2*.

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# CUCURBITACEAE

葫芦科 hu lu ke

Lu Anmin (路安民 Lu An-ming)[1], Huang Luqi (黄璐琦)[2], Chen Shukun (陈书坤)[3]; Charles Jeffrey[4]

Herbs, annual or perennial, or weak, woody shrubs with watery sap, scandent or prostrate. Roots fibrous or tuberous. Stem often angular. Leaves alternate, undivided or variously palmately or pedately divided, often cordate; tendrils solitary, lateral, simple or branched, spirally twisted, rarely absent; stipules absent. Plants monoecious or dioecious; flowers unisexual, very rarely bisexual; flowers paniculate, racemose, or subumbellate, rarely solitary. Calyx tube (hypanthium) adnate to ovary; tube rotate, campanulate, or saucer-shaped, usually 5-lobed; segments imbricate. Corolla usually sympetalous, inserted on calyx tube; segments valvate or involute. Stamens inserted at base or mouth of calyx tube, usually 5 or 3, of which one often 1-celled and other two 2-celled; filaments separate or variously united into a column; anthers separate or coherent into a head; anther cells straight to conduplicate, extrorse; rudimentary ovary often present in male flowers; staminodes often in female flowers. Ovary inferior or nearly completely so, mostly composed of 3 carpels, 3-locular, rarely 1- or 2- or spuriously 4–6-locular; ovules usually numerous, rarely few or solitary, horizontal, pendulous, or ascending, often immersed in pulp; placentas parietal, fleshy, often confluent at middle of ovary; style terminal, simple or branched at apex or styles free; stigma enlarged or 2-fid. Fruit usually a fleshy berry or corky, indehiscent or rarely opening by valves or by an operculum, rarely fibrous. Seeds often numerous, rarely few or solitary, horizontal, pendulous, or ascending, often compressed, rarely winged; endosperm absent; embryo with leaflike cotyledons and short radicle.

About 123 genera and over 800 species: most in tropics and subtropics, very rare in temperate regions; 35 genera (one endemic, nine introduced) and 151 species (73 endemic, 14 introduced) in China.

Lu An-ming & Zhang Zhi-yun. 1986. Cucurbitaceae. *In:* Lu An-ming & Chen Shu-kun, eds., Fl. Reipubl. Popularis Sin. 73(1): 84–280.

1a. Corolla segments fimbriate at margin.
2a. Ovules and seeds numerous; calyx tube less than 7 cm ..... 21. *Trichosanthes*
2b. Ovules 12, seeds usually 6, each with 1 abortive seed attached to its side; calyx tube 7–10 cm ..... 20. *Hodgsonia*
1b. Corolla segments not fimbriate.
3a. Stamens 5, anther cells ovoid and straight.
4a. Leaves palmately compound, rarely simple.
5a. Plants woody, scandent; leaflets almost entire, with 2 glands at base; seeds with membranous wing at apex ..... 4. *Neoalsomitra*
5b. Plants herbaceous, scandent; leaflets distinctly denticulate, eglandular at base; seeds without wing or rarely winged.
6a. Fruit indehiscent; seeds horizontal ..... 11. *Thladiantha*
6b. Fruit 3-valved, dehiscent at apex or rarely not dehiscent but then smaller in size; seeds pendulous.
7a. Corolla segments more than 5 mm; fruit clavate-cylindric, obovoid, or globose, more than 6-seeded ..... 1. *Hemsleya*
7b. Corolla segments less than 3 mm; fruit turbinate or globose, 1–3(–5)-seeded.
8a. Plants monoecious; fruit turbinate, 3-valved, dehiscent at apex ..... 2. *Gomphogyne*
8b. Plants dioecious; fruit globose or campanulate, indehiscent or dehiscent along ventral suture ..... 3. *Gynostemma*
4b. Leaves simple.
9a. Flowers with corolla segments less than 10 mm; fruit dehiscent, operculate or 3-valved.
10a. Leaf blade entire; fruit 6–10 cm, truncate at apex, 3-valved; seeds surrounded by a membranous wing ..... 5. *Zanonia*
10b. Leaf blade divided; fruit 1–3.5 cm, operculate; seed not winged or with membranous wing at apex.
11a. Plants monoecious; leaf blade cordate-hastate, eglandular at base; fruit dehiscent near middle; seeds not winged ..... 7. *Actinostemma*
11b. Plants dioecious; leaf blade with 1 or 2 pairs of glands at base; fruit dehiscent near apex; seeds with membranous wing at apex ..... 6. *Bolbostemma*

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9b. Flowers with corolla segments ca. 2 cm, or if smaller then calyx longer than corolla; fruit baccate, indehiscent; seed not winged.
12a. Flowers with calyx longer than corolla; anthers reniform; fruit more than 10 cm ..... 8. *Indofevillea*
12b. Flowers with corolla longer than calyx; anthers oblong; fruit less than 10 cm.
13a. Plants with black glandular scales ..... 9. *Siraitia*
13b. Plants without glandular scales.
14a. Tendrils spiraling only above point of branching; anther cells straight ..... 11. *Thladiantha*
14b. Tendrils spiraling also below point of branching; anther cells reniform-curved .... 10. *Sinobaijiania*
3b. Stamens 3 or 1, anther cells horizontal when only 1 stamen, or rarely 5 but then anther cells conduplicate.
15a. Stamens united into a central column and pollen sac fusing into ring; leaf blade pedatipartite ..... 22. *Cyclanthera*
15b. Stamens 3, or rarely 5 but then anther cells conduplicate; leaves not pedately compound.
16a. Flowers less than 10 mm in diam.
17a. Plants dioecious or rarely flowers bisexual; fruit 3-valved from apex to base when mature; seeds 1–3, pendulous ..... 14. *Schizopepon*
17b. Plants usually monoecious, rarely dioecious; fruit indehiscent; seeds often horizontal.
18a. Male flowers without pistillode; anther cells conduplicate; male and female flowers fasciculate in leaf axil ..... 29. *Diplocyclos*
18b. Male flowers with globose or subulate pistillode; anther cells straight, curved or conduplicate.
19a. Anther cells incurved or reflexed ..... 33. *Solena*
19b. Anther cells straight.
20a. Male flowers in sessile or subsessile fascicles; ovary hispid ..... 27. *Mukia*
20b. Male flowers in pedunculate cymes, racemes, or umbels, or solitary; ovary glabrous or with fine hairs.
21a. Filaments as long as or longer than anthers, ca. 1 mm or more.
22a. Corolla yellow; filaments and staminodes glabrous except at very base; seeds scrobiculate ..... 28. *Scopellaria*
22b. Corolla white or pale yellow; filaments and staminodes hairy above base; seeds smooth ..... 25. *Zehneria*
21b. Filaments shorter than anthers, 0.5–1 mm.
23a. Anther connective not produced beyond thecae; stigmas glabrous, apically shortly 2-lobed; fruit black when ripe ..... 24. *Melothria*
23b. Anther connective usually shortly produced beyond thecae; stigmas papillose, rounded; fruit white or red when ripe ..... 25. *Zehneria*
16b. Flowers more than 10 mm in diam.
24a. Anther cells straight; calyx tube narrowly funnelform ..... 17. *Edgaria*
24b. Anther cells conduplicate.
25a. Tendrils absent ..... 13. *Ecballium*
25b. Tendrils present.
26a. Corolla campanulate.
27a. Leaf blade hirsute, eglandular at base; flowers yellow; fruit large ..... 35. *Cucurbita*
27b. Leaf blade glabrous, with a few glands at base; flowers white; fruit ca. 5 cm ..... 30. *Coccinia*
26b. Corolla rotate or rarely campanulate but then segments almost free.
28a. Calyx tube in male flower elongate, tubular or funnelform.
29a. Flowers white; petiole apex 2-glandular ..... 31. *Lagenaria*
29b. Flowers yellow; leaf blade eglandular at base.
30a. Corolla rotate; leaf blade less than 10 cm ..... 19. *Gymnopetalum*
30b. Corolla campanulate; leaf blade over 10 cm.
31a. Leaf blade deeply lobed; seeds many, horizontal ..... 15. *Biswarea*
31b. Leaf blade undivided; seeds few, pendulous ..... 16. *Herpetospermum*
28b. Calyx rotate.
32a. Flowers with leaflike bract on pedicel; fruit usually muriculate, often 3-valved when mature ..... 12. *Momordica*
32b. Flowers without bract on pedicel.
33a. Male inflorescence racemose or subumbellate.
34a. Annual herb; fruit many seeded ..... 18. *Luffa*
34b. Perennial climber; fruit 1-seeded; seed large ..... 23. *Sechium*

33b. Flowers solitary or fascicled.
35a. Calyx segments subleaflike, dentate, reflexed ..... 34. *Benincasa*
35b. Calyx segments subulate, entire, not reflexed.
36a. Tendrils 2- or 3-fid; connective not produced ..... 32. *Citrullus*
36b. Tendrils simple; connective produced beyond anther cells ..... 26. *Cucumis*

## 1. HEMSLEYA Cogniaux ex F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 23: 490. 1888.

雪胆属 xue dan shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, perennial, scandent. Roots enlarged, oblate or rarely cylindric. Stem and branches slender or moderately robust. Tendrils filiform, 2-fid. Leaves pedately (3–)5–9(–11)-foliolate; leaflets narrowly oblong-lanceolate to obovate-lanceolate, membranous or papery. Plants dioecious. Inflorescence cymose-racemose to paniculate, axillary. Male flowers: calyx tube short; segments ovate to ovate-lanceolate, ascending, spreading, rotate, recurved, or reflexed; corolla pale yellow, yellow-green, or orange-red, rotate, discoid, turbinate, bowl-shaped, inverted bowl-shaped, Chinese lanternlike, or umbelliform; segments ovate-lanceolate to broadly ovoid, herbaceous or subsucculent; stamens 5; filaments exserted. Female flowers: calyx and corolla usually as in male flowers, sometimes slightly larger; ovary subglobose or conical, smooth or muriculate; styles 3; stigmas 2-lobed. Fruit globose, cylindric, or tubular-cylindric, longitudinally 9- or 10-striate or 9- or 10-angular, almost smooth or verrucose. Seeds elliptic or broadly ovate, usually with woody wings, sometimes wings membranous or absent.

About 27 species: subtropical or tropical Asia; 25 species (21 endemic) in China.

1a. Roots without tuber; seeds with broad membranous wing ..... 1. *H. graciliflora*
1b. Roots with tuber (except possibly for *H. heterosperma*); seeds without wing or with thin woody wing.
2a. Flower smaller, corolla 3–7 mm in diam.
3a. Corolla bowl-shaped, 5–7 mm in diam.; petals fleshy; fruit conical to cylindric, 2.4–3.5 cm × 8–10 mm; seeds oblong-elliptic to ovate, with a corky wing ..... 2. *H. delavayi*
3b. Corolla laxly patelliform, 3–5 mm in diam.; petals membranous-herbaceous; fruit obconic, 2–4 cm × 12–15 mm; seeds lenticular, ± isodiametric, unwinged ..... 3. *H. kunmingensis*
2b. Flower larger, corolla 8–15 mm in diam.
4a. Corolla segments spreading, explanate, or ascending, corolla bowl-shaped or rotate.
5a. Seeds strongly biconvex, almost without wing, margin slightly broad, 1–1.3(–2) mm; fruit conical to terete-elliptic.
6a. Corolla 15–20 cm, yellow-green, segments broadly ovate ..... 6. *H. panlongqi*
6b. Corolla 10–13 cm, green or pale green, segments strap-shaped; fruit conical or terete-conical.
7a. Corolla segments ascending; flower buds obtuse at apex ..... 4. *H. macrocarpa*
7b. Corolla segments spreading or reflexed; flower buds acute at apex ..... 5. *H. mitrata*
5b. Seeds oblong, lenticular, or strongly biconvex, margin narrower, less than 1 mm in diam.; fruit globose, narrowly elliptic, or narrowly conical.
8a. Seeds oblong, with thin corky wing; fruit narrowly elliptic to narrowly conical ..... 7. *H. dipterygia*
8b. Seeds biconvex, without wing; fruit globose or conical.
9a. Seeds lenticular; corolla bowl-shaped ..... 11. *H. sphaerocarpa*
9b. Seeds ovate to orbicular; corolla rotate.
10a. Fruit globose, pedicel with an articulation ..... 8. *H. amabilis*
10b. Fruit conical or cylindric, pedicel without an articulation.
11a. Fruit apex with distinct style; corolla segments lanceolate ..... 9. *H. heterosperma*
11b. Fruit apex without distinct style; corolla segments ovate-orbicular ..... 10. *H. lijiangensis*
4b. Corolla segments reflexed or revolute, corolla umbelliform or ± globose.
12a. Seed margin narrower; corolla red-brown or pale red-brown, base often dark red-brown.
13a. Leaflets 9–11; corolla bowl-shaped, 8–10 mm in diam. ..... 25. *H. endecaphylla*
13b. Leaflets (3–)5–9.
14a. Corolla Chinese lanternlike.
15a. Fruit elliptic; corolla 10–15 mm in diam. ..... 20. *H. chinensis*
15b. Fruit ovoid to globose; corolla 20–25 mm in diam. ..... 21. *H. gigantha*
14b. Corolla bowl-shaped (*H. dulongjiangensis* corolla unknown).
16a. Fruit elliptic, 5–8 cm; seed margin erose ..... 22. *H. dolichocarpa*
16b. Fruit ovoid to globose, 3–4 cm.

17a. Seed margin smooth; fruiting pedicel with an articulation; leaflets 5–7, elliptic-lanceolate ..... 23. *H. macrosperma*
17b. Seeds margin erose; fruiting pedicel without an articulation; leaflets 3–5, rhombic ..... 24. *H. dulongjiangensis*
12b. Seed margin smooth; corolla pale yellow or yellow-green.
18a. Fruit globose or subglobose.
19a. Corolla umbelliform, 10–12 mm in diam.; fruiting pedicel with an articulation ..... 12. *H. panacis-scandens*
19b. Corolla Chinese lanternlike or bowl-shaped, 6–12 mm in diam.
20a. Corolla Chinese lanternlike; fruit 2–2.5 cm in diam. ..... 13. *H. emeiensis*
20b. Corolla bowl-shaped; fruit 3–3.5 cm in diam. ..... 14. *H. pengxianensis*
18b. Fruit conical or elliptic to claviform-elliptic.
21a. Fruit elliptic or claviform, over 7 cm.
22a. Fruit narrowly elliptic-claviform, distinctly longitudinally costate, 7–8 cm, pedicel with indistinct articulation ..... 18. *H. chengyihana*
22b. Fruit broadly to narrowly elliptic, indistinctly costate, (6–)11–17 cm, pedicel with distinct articulation ..... 19. *H. zhejiangensis*
21b. Fruit conical to elliptic, 3.5–5 cm.
23a. Corolla bowl-shaped, segments carnose, 8–9 mm; fruit elliptic to ovoid ..... 17. *H. carnosiflora*
23b. Corolla Chinese lanternlike, segments thinner.
24a. Fruit conical, base cuneate; corolla segments 14–17 mm ..... 15. *H. turbinata*
24b. Fruit elliptic; base obtuse; corolla segments 10–15 mm ..... 16. *H. ellipsoidea*

**1. Hemsleya graciliflora** (Harms) Cogniaux in Engler, Pflanzenr. 66(IV. 275. I): 24. 1916.

马铜铃 ma tong ling

*Alsomitra graciliflora* Harms, Bot. Jahrb. Syst. 29: 602. 1901; *Gomphogyne bonii* Gagnepain; *Hemsleya graciliflora* var. *tianmuensis* X. J. Xue & H. Yao; *H. longgangensis* X. X. Chen & D. R. Liang.

Root fibrous; tuber absent. Leaves pedately 7-foliolate; petiole 1.8–3 cm; leaflets oblong-lanceolate to obovate-lanceolate, 5–10 × 2–3.5 cm; petiolule 4–7 mm. Inflorescence largely cymose; peduncle 5–20 cm, densely pubescent. Male flowers: pedicel filiform, 1–2 mm; calyx segments spreading, triangular, ca. 2 × 1 mm; corolla spreading, yellowish to pale yellow-green, rotate, 5–6 mm; segments obovate, 3–4 × ca. 2 mm, thinly membranous; filaments short, ca. 1 mm. Female flowers: calyx and corolla as in male flowers; ovary narrowly cylindric, base attenuate. Fruit conical, 2.5–3.5 × 1–1.5 cm; fruiting pedicel curved, 5–6 mm. Seeds oblong, compressed, 12–14 × 5–6 mm, with membranous wing, wing 3–4 mm at both ends of seed, seed body obovate. Fl. Jun–Sep, fr. Aug–Nov. $2n = 28$.

Mountain slopes; 500–2400 m. Guangdong, Guangxi, Hubei, Jiangxi, Sichuan, Zhejiang [Vietnam].

The fruit is used medicinally.

**2. Hemsleya delavayi** (Gagnepain) C. Jeffrey ex C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 134. 1985.

短柄雪胆 duan bing xue dan

Tuber oblate to conical. Stem and branchlets slender. Tendrils glabrous, 2-fid. Leaves pedately 5–7-foliolate; petiole 2–5 mm; leaflets lanceolate to elliptic-lanceolate, median leaflets 3–10 cm × 8–15 mm; petiolule 2–3 mm. Plants dioecious. Inflorescence dichotomous, to 30 cm; pedicels filiform, 2–5 mm. Male flowers: calyx segments ovate-lanceolate, 2–4 mm, glabrous, apex acute; corolla orange-yellow to pale yellow, bowl-shaped, 5–7 mm in diam.; segments ovate, revolute, 5–6 mm; filaments short, 0.5–1 mm. Female flowers: slightly larger than male flowers; ovary cylindric to conical, 4–5 × 2–2.5 mm. Fruit conical to cylindric, 2.4–3.5 cm × 8–10 mm, base attenuate, slightly curved; fruiting pedicel 4–7 mm. Seeds dark brown, narrowly elliptic, compressed, 10–12 × 4–6 mm, with corky wing; wing 3–4 mm at apex, ca. 1 mm wide on both sides; seed body broadly elliptic to ovate. Fl. Jul–Sep, fr. Aug–Oct.

• Forests, valleys, mountain slopes; 1600–2200 m. SW Sichuan, C and W Yunnan.

1a. Leaves subglabrous; corolla segments in male acute at apex ..... 2a. var. *delavayi*
1b. Leaves densely pubescent; corolla segments in male rounded-obtuse at apex ..... 2b. var. *yalungensis*

**2a. Hemsleya delavayi** var. **delavayi**

短柄雪胆(原变种) duan bing xue dan (yuan bian zhong)

*Gomphogyne delavayi* Gagnepain, Bull. Mus. Natl. Hist. Nat. 24: 373. 1918; *Hemsleya brevipetiolata* Handel-Mazzetti.

Leaves subglabrous. Corolla segments in male flowers acute at apex.

• Forests, valleys; 1800–2000 m. SW Sichuan, C and W Yunnan.

**2b. Hemsleya delavayi** var. **yalungensis** (Handel-Mazzetti) C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 134. 1985.

雅砻雪胆 ya long xue dan

*Hemsleya brevipetiolata* var. *yalungensis* Handel-Mazzetti, Symb. Sin. 7: 1059. 1936.

Leaves densely pubescent. Corolla segments in male flowers rounded-obtuse at apex.

• Mountain slopes; 1600–2200 m. SW Sichuan.

**3. Hemsleya kunmingensis** H. T. Li & D. Z. Li, Ann. Bot. Fenn. 44: 486. 2007.

昆明雪胆 kun ming xue dan

Tuber enlarged, ovoid. Stem slender, tomentose when young but smooth when older. Tendril glabrous, distally 2-fid. Leaves pedately 7–9-foliolate; petiole 2–4 cm; leaflets lanceolate to oblong; median leaflets 6–12 × 1–1.5 cm; petiolule 2–4 mm. Plants dioecious. Inflorescence dichasial, 5–30 cm, 10–30-flowered; pedicels 5–10 mm. Male flowers: calyx segments broadly triangular, 3–5 mm, revolute, shortly cuspidate at apex; corolla yellowish green, laxly patelliform, 3–5 mm in diam., herbaceous; segments elliptic, 3–5 mm, evaginate and revolute into an anchor shape at apex; filaments 1–2 mm; anthers whitish. Female flowers: calyx and corolla as in male flowers; ovary conical; styles 3, 1–2 mm. Fruit many, greenish, longitudinally 10-striate, obconic, 2–4 × 1.2–1.5 cm, almost smooth; fruiting pedicel 10–15 mm. Seeds many, blackish brown, lenticular, 5–8 mm in diam., 2–3 mm thick, verrucose, unwinged. Fl. Jun–Sep, fr. Aug–Nov.

• Damp valleys in secondary forests; ca. 2300 m. C Yunnan.

**4. Hemsleya macrocarpa** (Cogniaux) C. Y. Wu ex C. Jeffrey, Kew Bull. 36: 739. 1982.

圆锥果雪胆 yuan zhui guo xue dan

Tuber oblate or ovoid. Stem sometimes slightly thickened at nodes. Leaves pedately 7–9-foliolate; petiole 3–7 cm, sparsely puberulent or subglabrous; leaflets obovate-lanceolate to elliptic-lanceolate; median leaflets 6–10 × 2.5–4 cm; petiolule 2–6 mm. Inflorescence dichotomously cymose, 4–12 cm; peduncle and branches slightly flexuous. Male flowers: bud obtuse at apex; calyx segments spreading, ovate-lanceolate, 4–5 × 2–3 mm; corolla green to pale yellow-green, rotate, 7–15 mm in diam.; segments strap-shaped, 6–7 × 2–3 mm, fleshy, base with a pair of glands; filaments less than 1 mm. Female flowers: calyx and corolla as in male flowers; ovary conical, 5–7 × 3–4 mm. Fruit campanulate to conical, (3–)4–7 × 3–4 cm, with distinct ribs; fruiting pedicel 8–10 mm. Seeds dark brown, irregularly orbicular, 12–15 × 8–12 mm, 3–4 mm thick, with very narrow wing. Fl. Jul–Sep, fr. Sep–Nov. $2n = 28$.

Evergreen forests, thickets on mountain slopes; 1000–2300 m. NW and SW Yunnan [NE India].

1a. Fruit (3–)4.5(–6) cm, (1.3–)1.6(–1.85) × as long as broad ..... 4a. var. *macrocarpa*
1b. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.
2a. Corolla 7–9 mm in diam. ..... 4b. var. *clavata*
2b. Corolla 12–15 mm in diam. ..... 4c. var. *grandiflora*

**4a. Hemsleya macrocarpa** var. **macrocarpa**

圆锥果雪胆(原变种) yuan zhui guo xue dan (yuan bian zhong)

*Gomphogyne macrocarpa* Cogniaux in Engler, Pflanzenr. 66(IV. 275. I): 40. 1916; *Hemsleya changningensis* C. Y. Wu & Z. L. Chen; *H. obconica* C. Y. Wu & Z. L. Chen.

Fruit (3–)4.5(–6) cm, (1.3–)1.6(–1.85) × as long as broad.

Evergreen forests; 1000–2200 m. SW Yunnan [NE India].

**4b. Hemsleya macrocarpa** var. **clavata** (C. Y. Wu) D. Z. Li, Syst. Evol. *Hemsleya*, 76. 1993.

棒果雪胆 bang guo xue dan

*Hemsleya clavata* C. Y. Wu, Acta Phytotax. Sin. 23: 124. 1985.

Corolla 7–9 mm in diam. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.

• Broad-leaved forests; 1400–1500 m. SW Yunnan.

**4c. Hemsleya macrocarpa** var. **grandiflora** (C. Y. Wu) D. Z. Li, Syst. Evol. *Hemsleya*, 76. 1993.

大花雪胆 da hua xue dan

*Hemsleya grandiflora* C. Y. Wu, Acta Phytotax. Sin. 23: 130. 1985.

Corolla 12–15 mm in diam. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.

• Thickets on mountain slopes; ca. 2300 m. NW Yunnan.

**5. Hemsleya mitrata** C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 128. 1985.

帽果雪胆 mao guo xue dan

Tuber enlarged. Stem and branchlets stout, sparsely puberulent, ultimately glabrous; stem nodes thickened, densely pubescent. Leaves pedately 5–7-foliolate; petiole 5–8 cm; leaflets lanceolate to elliptic-lanceolate, margin serrate; median leaflets 5–11 × 2.5–4 cm; petiolule 2–5 mm. Plants dioecious. Inflorescence peduncle slightly reflexed, 5–11 cm. Male flowers: buds acute at apex; calyx segments lanceolate, ca. 6 × 3 mm; corolla pale yellow-green, rotate, 10–11 mm, fleshy; segments ± strap-shaped, base with 2 distinct glands. Female flower unknown. Fruit caplike, 4–5 × 3–3.6 cm. Seeds dark brown, broadly ovoid, 12–13 × 9–10 mm, 3–3.5 mm thick, almost unwinged. Fl. Jul–Oct, fr. Sep–Dec.

• Thickets on mountain slopes; 2400–2700 m. SW Yunnan.

**6. Hemsleya panlongqi** A. M. Lu & W. J. Chang, Acta Phytotax. Sin. 21: 183. 1983.

盘龙七 pan long qi

Tuber oblate-spheroid. Branches slender, sulcate-angular, densely pubescent at nodes. Tendrils 2-fid. Leaves pedately 7-foliolate; petiole 2–4 cm; leaflets elliptic-lanceolate to ovate-lanceolate, median leaflets 8–12 × 2–3.5 cm, lateral leaflets smaller, base cuneate, margin serrate, apex acuminate; petiolule 3–6 mm, densely pubescent. Inflorescence peduncle filiform; pedicel linear, 12–15 mm. Male flower unknown. Female flowers: bracts very small, subulate; calyx segments 5, ovate-lanceolate, ca. 10 × 3 mm, apex acuminate; corolla pale yellow to yellow-green, rotate, 15–20 mm in diam.; segments spreading, broadly ovate, ca. 12 × 8 mm; ovary ovoid-globose to narrowly ovoid, 8–11 × 4–6 mm. Fl. Sep.

• Broad-leaved forests; ca. 1800 m. S Sichuan.

**7. Hemsleya dipterygia** Kuang & A. M. Lu, Acta Phytotax. Sin. 20: 88. 1982 [*"dipteriga"*].

翼蛇莲 yi she lian

*Hemsleya cissiformis* C. Y. Wu.

Tuber enlarged. Stem usually thickened at nodes, densely pubescent, ultimately glabrous. Tendrils glabrous. Leaves pedately 5–7-foliolate; petiole 2–6 cm; leaflets broadly lanceolate to rhombic, margin serrate or crenate, median leaflets 7–11 × ca. 2.5 cm, lateral leaflets smaller; petiolule 2–4 mm. Inflorescence peduncle and branches filiform. Male flowers: pedicel 5–10 mm; calyx segments ovate, ca. 7 mm; corolla pale yellow to pale yellow-green, rotate to bowl-shaped, 12–13 mm in diam.; corolla segments spreading, broadly obovate, ca. 8 × 7.5 mm, apex obtuse; filaments less than 1 mm. Female flower unknown. Fruit oblong-claviform or claviform, 4–5.5 × 0.6–1.7 cm, densely pubescent when immature, glabrous when mature, with indistinct ribs. Seeds dark brown, oblong, ca. 14 × 15 mm, 3–4 mm thick. Fl. Jun–Oct, fr. Aug–Nov.

Broad-leaved forests; 100–1500 m. N Guangxi, S Guizhou, C and S Yunnan [N Vietnam].

**8. Hemsleya amabilis** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 206. 1912.

曲莲 qu lian

Tuber oblate-spheroid. Stem and branchlets very slender. Tendrils 8–12 cm. Leaves pedately 5–9-foliolate; petiole 2–4 cm; leaflets lanceolate to narrowly lanceolate, median leaflets 4–5 × 1–1.5 cm. Male flowers dichotomously cymose; peduncle slightly flexuous, 5–15 cm; calyx segments 5, ovate-triangular, 4–5 × ca. 2 mm; corolla pale yellow to pale yellow-green, rotate, 10–12 mm in diam.; segments spreading, broadly obovate, 5–6 × 4–5 mm; filaments ca. 2 mm, exserted. Female flowers in simple dichotomously cymose inflorescence, larger than male flowers, 11–12(–15) mm in diam.; ovary subglobose, 4–5 mm. Fruit spheroid, 12–20 mm; fruiting pedicel filiform, 2–3 mm. Seeds dark brown, broadly ovate-orbicular, 6–8 × 5–7 mm, 3–4 mm thick, unwinged. Fl. Jun–Oct, fr. Aug–Nov. $2n$ = 28*.

• Forests; 1800–3000 m. SW Sichuan, C and W Yunnan.

**9. Hemsleya heterosperma** (Wallich) C. Jeffrey, Kew Bull. 36: 739. 1982.

异子雪胆 yi zi xue dan

*Zanonia heterosperma* Wallich, Pl. Asiat. Rar. 2: 29. 1831; *Alsomitra heterosperma* (Wallich) M. Roemer; *Gomphogyne heterosperma* (Wallich) Kurz.

Tuber unknown. Stem slender, glabrous. Leaves pedately 3–5-foliolate; petiole 3–4 cm, glabrous; leaflets ovate-lanceolate, base attenuate, apex shortly acuminate; median leaflets 5–7 × ca. 1.5 cm; petiolule 3–6 mm. Plants dioecious. Inflorescence compound or simple; peduncle slender, slightly flexuous, glabrous. Male flowers: calyx segments subulate, ca. 1 mm, apex apiculate; corolla pale yellow to pale yellow-green, rotate, 3–4 mm in diam.; segments ovate-lanceolate, ca. 3 × 1 mm, glabrous, apex acuminate; filaments free, ca. 1 mm. Female flowers similar to male flowers; peduncle 5–11 cm; ovary conical. Fruit pale yellow-green, narrowly campanulate or claviform, 12–35 × 6–12 mm, glabrous, with distinct ribs, dehiscent at apex, 3-seeded in each locule. Seeds small, irregularly ovate, ca. 3 × 2 mm, ca. 1 mm thick. Fl. Sep–Oct, fr. Oct–Nov. $2n$ = 28.

Rain forests, evergreen broad-leaved forests; 100–2300 m. Yunnan [Myanmar, Thailand].

**10. Hemsleya lijiangensis** A. M. Lu ex C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 129. 1985.

丽江雪胆 li jiang xue dan

Tuber enlarged. Stem and branchlets filiform, sparsely pubescent, ultimately subglabrous. Tendrils apically 2-fid. Leaves pedately 5–7-foliolate; petiole 2–4 cm; leaflets oblong-lanceolate to narrowly lanceolate; median leaflets 6–12 × 2–2.2 cm; petiolule 2–4 mm. Male flowers: inflorescence peduncle and branchlets flexuous, 4–5 cm, densely pubescent; pedicel filiform; calyx segments 5, spreading, ovate-triangular, ca. 4 × 2 mm, apex acuminate; corolla pale yellow, rotate, 8–10 mm; segments spreading, obovate, ca. 5 × 4 mm; filaments ca. 2 mm. Female flowers solitary or few dichotomously cymose in leaf axils; pedicel 5–30 mm; ovary narrowly campanulate or conical, ca. 3 × 2 mm, densely white punctate. Fruit campanulate to conical, 2.2–4 cm × 13–18 mm. Seeds dark brown, irregularly orbicular, compressed, 4–6 × 4–5 mm, 2–3 mm thick. Fl. Jul–Sep, fr. Aug–Oct.

• Forests; 2000–3000 m. NW Yunnan.

**11. Hemsleya sphaerocarpa** Kuang & A. M. Lu, Acta Phytotax. Sin. 20: 87. 1982.

蛇莲 she lian

Tuber oblate-spheroid. Stem and branchlets slender, nodes densely pubescent. Tendrils 8–24 cm. Leaves pedately 5–9-foliolate; petiole 1.6–4 cm; leaflets oblong-lanceolate to broadly lanceolate; median leaflets 7–16 × 2.5–4 cm. Male flowers in a large dichotomous cyme, 5–25(–45) cm (varying in different subspecies); calyx segments ovate-triangular, ca. 4 × 3 mm; corolla pale yellow-green, bowl-shaped, 7–15 mm in diam.; segments broadly ovate, apex acuminate. Female flowers usually in a short inflorescence; ovary spheroid to ovoid, 3–5 mm. Fruit spheroid to ovoid, 2–3 cm in diam.; fruiting pedicel 1–9 mm, with distinct articulation. Seeds lenticular, 8–9 mm in diam., unwinged. Fl. May–Sep, fr. Jul–Nov. $2n$ = 28*.

• Broad-leaved forests; 400–2400 m. E and NE Guangxi, S and SE Guizhou, S Hunan, SE, SW, and WC Yunnan.

1a. Male inflorescence (14–)20(–44) cm ..... 11b. subsp. *megathyrsa*
1b. Male inflorescence (5–)9(–15) cm.
2a. Corolla (7–)8(–9) mm in diam.; fruiting pedicel 1–2 mm ..... 11c. subsp. *wenshanensis*
2b. Corolla (9–)12(–15) mm in diam.; fruiting pedicel 8–9 mm ..... 11a. subsp. *sphaerocarpa*