

## 10. CALYSTEGIA R. Brown, Prodr. 483. 1810, nom. cons.

打碗花属 da wan hua shu

Fang Rhui-cheng<sup>1</sup>; Richard K. Brummitt<sup>2</sup>

Herbs prostrate or erect to twining to several meters tall, rhizomatous [or woody at base]. Leaves sessile to petiolate, oblong to hastate or sagittate [or rarely pedate]. Inflorescences axillary, 1-flowered [or few-flowered] cymes; bracteoles 2, sepal-like, inserted immediately below calyx, ovate and sometimes saccate, enclosing calyx [or remote from calyx and subulate or leaf-shaped], persistent. Sepals subequal, persistent. Corolla white, pink [or pale yellow], funnelform, with 5 distinct midpetaline bands, glabrous. Stamens included, equal. Pollen globose, pantoporate, not spiny. Ovary 1-loculed, 4-ovuled. Style 1, included in corolla; stigmas 2, clavate. Capsule globose, glabrous, indehiscent. Seeds 4, smooth or minutely tuberculate.

Approximately 70 intergrading subspecific taxa which can be arbitrarily combined into about 25 species: mostly temperate but sparingly extending to the tropics; six species in China.

Nearly all taxa in *Calystegia* intergrade geographically into neighboring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. Almost half of the genus is endemic in California, U.S.A., and the exceptions noted in the generic description in brackets [ ] all refer to the Californian endemics. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically.

- 1a. Leaves reniform; bracteoles ca. as long as or shorter than sepals; plants of seashores ..... 1. *C. soldanella*
- 1b. Leaves not reniform; bracteoles longer than sepals; plants mostly of inland habitats.
  - 2a. Corolla 2–3.5 cm; leaves with abruptly spreading, usually acutely 2-angled lobes ..... 2. *C. hederacea*
  - 2b. Corolla 4–7 cm; leaves unlobed to distinctly lobed with lobes entire to occasionally acutely 2-angled.
    - 3a. Plants trailing or suberect to climbing; leaves oblong to narrowly triangular with lobes seldom more than 1/3 length of midvein, if present at all; corolla pink.
    - 4a. Stems appressed pubescent to villous; petiole usually less than 1.2 cm and less than 1/4 length of leaf blade; leaves without basal lobes to shortly hastate at base ..... 3. *C. pellita*

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- 4b. Stems glabrous to pubescent; petiole usually more than 1.2 cm and 1/5–2/3 as long as midvein; leaves distinctly lobed at base ..... 4. *C. pubescens*
- 3b. Plants climbing; leaves triangular with lobes 1/3–1/2 length of midvein; corolla pink or white.
  - 5a. Corolla pink; leaf sinus with divergent sides ..... 5. *C. sepium*
  - 5b. Corolla usually white; leaf sinus with parallel sides ..... 6. *C. silvatica*

**1. *Calystegia soldanella*** (Linnaeus) R. Brown, Prodr. 483. 1810.

Islands), Korea, Russia; Africa, Asia, Australia, Europe, North America, Pacific Islands, South America].

肾叶打碗花 shen ye da wan hua

*Convolvulus soldanellus* Linnaeus, Sp. Pl. 1: 159. 1753; *Calystegia reniformis* R. Brown; *C. soldanelloides* Makino; *Convolvulus asarifolius* Salisbury; *C. maritimus* Lamarck; *C. reniformis* (R. Brown) Poiret.

Plants glabrous. Stems prostrate, to 1 m, scarcely twining or not. Petiole longer than leaf blade; leaf blade reniform, slightly fleshy, sinus divergent or shortly parallel sided, apex rounded to emarginate, sometimes mucronate. Lower peduncles usually exceeding leaves, upper peduncles often shorter; bracteoles ovate to nearly circular, usually shorter than calyx, apex obtuse or retuse. Corolla pink, 3–5(–5.5) cm. Stamens (1.8–)2.1–2.7(–3) cm; anthers (3–)4–5.5(–6) mm. Fl. May–Jul, fr. Jul–Sep.  $2n = 22$ .

Sandy seashores, coastal dunes; sea level. Fujian, Hebei, Jiangsu, Liaoning, Shandong, Taiwan, Zhejiang [Japan (including Ryukyu

**2. *Calystegia hederacea*** Wallich in Roxburgh, Fl. Ind. 2: 94. 1824.

打碗花 da wan hua

*Calystegia abyssinica* Engler; *C. acetosifolia* (Turczaninow) Turczaninow, *C. hederacea* Wallich var. *elongata* Liou & Ling; *Convolvulus acetosifolius* Turczaninow; *C. calystegioides* Choisy; *C. wallichianus* Sprengel; *Volvulus hederaceus* (Wallich) Kuntze.

Plants glabrous. Stems erect when young, later shoots prostrate or twining, to 1 m. Petiole 1–5 cm; leaf blade sagittate, triangular to narrowly triangular, 2–8 × 2–7 cm including lobes; lobes abruptly spreading, with 2 (or 3) acute angles, sinus with divergent sides. Lower peduncles exceeding leaves, upper peduncles shorter; bracteoles ± ovate, 0.7–1.4(–1.8) cm × (4–)6–10(–12) mm, flat, apex acute to ± obtuse. Corolla pale pink or occasionally whitish or purplish,

2–3.5 cm. Stamens 1.1–1.6(–1.9) cm; anthers 3–4 mm. Fl. Mar-Sep, fr. Jun-Sep.  $2n = 22, 30$ .

Fields, wasteland, roadsides, river banks, often on sandy soils; 100–3500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, India, Japan, Korea, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Russia, Tajikistan; NE Africa, rarely introduced in North America].

Only one collection has ever been made in Africa, from Ethiopia, and only two or three collections have been seen from North America.

**3. *Calystegia pellita* (Ledebour) G. Don, Gen. Hist. 4: 296. 1837.**

藤长苗 *teng chang miao*

Plants appressed pubescent to villous. Stems prostrate to weakly climbing, or  $\pm$  erect, to 1 m. Petiole 1–12 mm; leaf blade narrowly triangular to oblong,  $3-7 \times$  as long as wide, unlobed to slightly hastate or with short lobes less than 1/4 length of midvein, sparsely pubescent to villous. Peduncle not exceeding leaves, pubescent; bracteoles  $1.3-2.4 \times 1-1.8$  cm, apex acute to obtuse. Corolla pink, 4.4–5.5 cm. Stamens 2.5–3.3 cm; anthers 5(–6) mm.  $2n = 22$ .

Grassy places, mountain slopes, sometimes a weed of cultivation; 300–700(–1700) m. Anhui, Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, ?Nei Mongol, Shandong [Korea, ?Mongolia, Russia].

- 1a. Leaves 0.8–2 cm wide,  $4-7 \times$  as long as wide; major lateral veins 4–9 pairs  
..... 3b. subsp. *longifolia*
- 1b. Leaves 1.5–3 mm wide,  $3-4 \times$  as long as wide; major lateral veins 3–5 pairs.
  - 2a. Stems prostrate to weakly climbing leaves mostly narrowly triangular, base truncate to slightly hastate or weakly lobed ..... 3a. subsp. *pellita*
  - 2b. Stems  $\pm$  erect; leaves broadly oblong, base truncate ..... 3c. subsp. *stricta*

**3a. *Calystegia pellita* subsp. *pellita***

藤长苗 (原变种) *teng chang miao (yuan bian zhong)*

*Convolvulus pellitus* Ledebour, Fl. Altaic. 1: 223. 1829; *Calystegia dahurica* (Herbert) Choisy; *C. dahurica* var. *pellita* (Ledebour) Choisy; *Convolvulus dahuricus* Herbert.

Stems prostrate to weakly climbing. Leaves mostly narrowly triangular, 1.5–3 cm wide, ca.  $3 \times$  as long as wide, base truncate to slightly hastate or weakly lobed; major lateral veins 3–5 per side.

Heilongjiang, ?Nei Mongol [?Mongolia, Russia].

A seldom-collected taxon with very few collections from China; most collections are from eastern Russia from Irkutskaya to Primorsk. One early specimen at Kew, labelled “Gehol, Chine/ Mongolie Orientale, *Abbé David*,” cannot be placed with certainty in the provincial scheme for modern China. In 1955, the former province of

Jehol was divided among Hebei, Liaoning, and Nei Mongol and it is unclear to which of these provinces the *Abbé David* specimen should correctly be referred. Based on our very limited knowledge of this subspecies range, one would expect it to occur in Nei Mongol, and this province has been listed with a question mark. More collections are needed for this taxon.

**3b. *Calystegia pellita* subsp. *longifolia* Brummitt, Kew Bull. 35: 331. 1980.**

长叶藤长苗 *chang ye teng chang miao*

Stems prostrate to weakly climbing. Leaves oblong, mostly 0.8–2 cm wide,  $4-7 \times$  as long as wide, base rounded to weakly hastate; major lateral veins 4–9 pairs. Fl. Jun-Aug, fr. Aug-Sep.

Mountains, stream banks, cultivated land. Anhui, Hebei, Jiangsu, Jilin, Liaoning, Shandong [Korea].

This is the plant referred to as *Calystegia subvolubilis* by Liou and Ling (Fl. Ill. Nord Chine p. 21, t. 6. 1931).

**3c. *Calystegia pellita* subsp. *stricta* Brummitt, Kew Bull. 35: 331. 1980.**

直立藤长苗 *zhi li teng chang miao*

Stems  $\pm$  erect, with crowded leaves. Leaves broadly oblong, 1.5–2.5 cm wide,  $3-4 \times$  as long as wide, base truncate; major lateral veins 3 or 4 per side. Fl. Jun-Jul.

Mountains. Jilin [N Korea, E Russia].

**4. *Calystegia pubescens* Lindley, J. Hort. Soc. London 1: 70. 1846.**

柔毛大碗花 *rou mao da wan hua*

*Calystegia dahurica* f. *anestia* (Fernald) Hara; *C. japonica* Choisy; *C. japonica* f. *albiflora* (Makino) Hara; *C. japonica* var. *albiflora* Makino; *Convolvulus pellitus* Ledebour f. *anestius* Fernald; *Volvulus japonicus* (Thunberg) Farwell var. *pubescens* (Lindley) Farwell.

Stems trailing or usually climbing, to several meters tall, glabrous to sparsely pubescent. Petiole 1–6 cm; leaf blade narrowly triangular to oblong, glabrous to sparsely pubescent,  $\pm$  parallel sided at middle, weakly to strongly lobed at base but lobes not more than 1/3 length of midvein. Peduncles not exceeding leaf, glabrous or pubescent toward base; bracteoles  $1.5-2.1(-2.4) \times 0.8-1.4$  cm, usually glabrous and obtuse. Corolla pink or rarely white, 4.2–6.7 cm. Stamens 2.4–3.2 cm; anthers 4.5–6 mm. Fl. Aug.  $2n = 22$ .

Waste places, grassy or shrubby hillsides, sometimes a weed of cultivation. Beijing Shi, Heilongjiang, Hebei, Hubei, Jiangsu, ?Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea; double-flowered form introduced in Europe and North America].

The name *Calystegia pubescens* was given to a double-flowered form cultivated in Britain that is now naturalized in Europe and North America, which was originally collected near Shanghai. Normal-flowered plants from this area were referred by Liou and Ling (Fl. Ill. Nord Chine p. 27. 1931) as *C. japonica* Choisy, but *C. pubescens* is the earlier name. In North America, *Calystegia pubescens* is commonly introduced and has often been misidentified

as *C. hederacea* Wallich.

Plants intermediate between *Calystegia pubescens* and *C. hederacea*, from Japan, where they probably are sympatric, have been named as *Convolvulus japonicus* Thunberg (= *Calystegia sepium* var. *japonica* (Thunberg) Makino, non *Calystegia japonica* Choisy). Their status is in doubt.

**5. *Calystegia sepium* (Linnaeus) R. Brown subsp. *spectabilis*** Brummitt, J. Linn. Soc., Bot. 64: 73. 1971.

欧旋花 ou xuan hua

*Calystegia dahurica* (Herbert) G. Don; ?*Calystegia sepium* (Linnaeus) R. Brown var. *integrifolia* Liou & Ling; *Convolvulus dahuricus* Herbert.

Stems climbing to several meters tall, glabrous or pubescent. Petiole 2–8 cm; leaf blade ± triangular with basal lobes 1/3–1/2 as long as the midvein, glabrous to sparsely pubescent; sinus with divergent sides. Peduncles not exceeding leaf; bracteoles to 3 × 2.2 cm, keeled to somewhat saccate at base and slightly overlapping, apex acute to ± obtuse. Corolla pink, (4.5–)5.5–6.5 cm. Stamens (2.2–)2.5–3 cm; anthers 5.5–6.5 mm. Fl. Jun–Aug, fr. Sep.

Waste places, river banks. Beijing Shi, ?Heilongjiang, Jilin, Liaoning, ?Tianjin Shi [Japan, ?Korea, Russia; introduced in N Europe].

*Calystegia sepium* is a widespread and highly polymorphic species with a number of subspecies recognized in temperate parts of the northern and southern hemispheres.

*Calystegia sepium* subsp. *spectabilis* was described from a plant naturalized in northern Europe, the native provenance of which is uncertain. The relationships of this to the plants from China and northern Russia, and also to *C. pulchra* Brummitt & Heywood, which was also described from a plant naturalized in northern Europe, are uncertain. The material from China and adjacent Russia is relatively uniform. It has larger and more inflated bracteoles and larger flowers than most subspecies of *C. sepium*, in this respect coming close to *C. silvatica* (Kitaibel) Grisebach, but it is apparently always pink flowered. A similarity to *C. sepium* subsp. *appalachiana* Brummitt, from the eastern U.S.A., should also be noted.

*Calystegia sepium* subsp. *spectabilis* intergrades into *C. pubescens* in N Korea and N Japan, and intermediates with *C. pellita* (Ledebour) G. Don are found in N China.

*Calystegia dahurica* (Herbert) G. Don is probably referable here, but the provenance of the original plant is unknown. No type specimen has been traced, and the name can only be typified by a rather inadequate original illustration.

**6. *Calystegia silvatica* (Kitaibel) Grisebach subsp. *orientalis*** Brummitt, Kew Bull. 35: 332. 1980.

鼓子花 gu zi hua

Stems climbing to several meters tall, glabrous. Petiole 2–8 cm; leaf blade ± triangular with basal lobes 1/3–1/2 as long as midvein, glabrous; sinus with parallel sides. Peduncles sometimes paired in leaf axils, not exceeding leaf; bracteoles ± overlapping each other, saccate, apex ± acute to ± obtuse. Corolla white or rarely pinkish, 4.3–6(–7.2) cm; stamens 2.3–3.3 cm; anthers (2.5–)3–5(–5.5) mm.

• Roadsides, fields, streamsides, forest margins; 100–2600 m. Anhui, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang.

This subspecies could be equally referred to *Calystegia sepium*. It shows a marked affinity with *C. silvatica* subsp. *fraterniflora* (Mackenzie & Bush) Brummitt (C and E U.S.A.) in its often paired peduncles, the flower buds drying blackish in herbarium specimens, and the parallel-sided leaf sinus. It differs from European *C. silvatica* subsp. *silvatica* in having more acute and less overlapping bracteoles, and usually shorter corollas, stamens, and anthers.

