

## 15. IPOMOEAE Linnaeus, Sp. Pl. 1: 159. 1753.

番薯属 fan shu shu

*Calonyction* Choisy; *Exogonium* Choisy; *Mina* Llave & Lexarza; *Pharbitis* Choisy; *Quamoclit* Miller.

Herbs or shrubs, often twining, sometimes prostrate, erect, or floating. Leaves petiolate, entire, lobed, or divided. Inflorescences mostly axillary, cymose, 1- to many flowered, rarely paniculate; bracts various. Flowers small to large. Sepals persistent, equal to unequal, ± enlarged in fruit. Corolla variously colored, rarely yellow, funnelform, campanulate, or salverform; limb 5-lobed to entire, midpetaline bands well defined. Stamens included or exserted; filaments filiform, usually unequal, dilated and pubescent basally; anthers ovate or linear, longitudinally dehiscent, not twisted; pollen globular, pantoporate, finely spiny. Disc ringlike. Ovary 2–4-loculed, 4- or 6-ovuled. Style 1, filiform, included or exserted; stigma capitate, or 2- or 3-globulose. Capsule globose or ovoid, 4- or 6-valved. Seeds 4(–6) or fewer, glabrous or pubescent.

Approximately 500 species: widely distributed in tropical to warm temperate regions, especially of North and South America; 29 species in China.

The following are cultivated in China and may escape from gardens in the south: *Ipomoea quamoclit* Linnaeus (= *Quamoclit pennata* (Desrousseaux) Bojer), *I. hederifolia* Linnaeus (widely misidentified as *Quamoclit coccinea* (Linnaeus) Moench or *I. coccinea* Linnaeus), *I. ×sloteri* (House) van Ooststroom (= *Quamoclit ×sloteri* House), and *I. tricolor* Cavanilles. These have been included in the key to species and given no further treatment.

*Ipomoea fulvicoma* Hance was originally described from Hong Kong, but no material of the species was available for study. *Ipomoea lancunosa* Linnaeus was reported from Zhejiang by Chiu et al. (Acta Bot. Yunnan. 16: 231–234. 1994), but its occurrence has not been verified by us, and the species has not been included here.

The generic concept for *Ipomoea* in this flora differs from that followed in the Fl. Reipubl. Popularis Sin. in that *Pharbitis*, *Calonyction*, *Quamoclit*, and *Mina* are recognized as infrageneric taxa, following D. F. Austin (Taxon 28: 359–361. 1979; emended, 29: 501–502. 1980) and most other twentieth century floras. In any case, cultivated species including those referable to *Quamoclit* and *Mina* that were treated in the Fl. Reipubl. Popularis Sin. account are mostly omitted in the Flora of China.

- 1a. Sepals distinctly awned at or below apex; corolla salverform with a long narrow tube; stamens and pistil mostly exserted.
  - 2a. Corolla longer than 4.5 cm, white or purplish; outer sepals 5–12 mm (excluding awn), inner sepals 7–15 mm (excluding awn).
    - 3a. Corolla white, tube slightly widened apically or not, 7–12 cm; stamens and style exserted ..... 21. *I. alba*
    - 3b. Corolla purplish, tube distinctly widened apically, 3–6 cm; stamens and style scarcely exserted or not ..... 22. *I. turbinata*
  - 2b. Corolla 3–4.5 cm, scarlet, rarely pure white; outer sepals 2–4.5 mm (excluding awn), inner sepals 3–6 mm (excluding awn).
    - 4a. Leaves cordate, entire, angled, or palmately lobed, not pinnately parted ..... *I. hederifolia*
    - 4b. Leaves linear-lanceolate, linear, or filiform, pinnately parted.
      - 5a. Leaf segments ca. 3–7 on either side of midvein, linear or linear-lanceolate ..... *I. ×sloteri*
      - 5b. Leaf segments more numerous, linear or filiform ..... *I. quamoclit*
- 1b. Sepals rounded to acuminate, emarginate, or mucronulate but never awned at or near apex; corolla mostly funnelform, or campanulate, sometimes salverform; stamens and pistil mostly included, sometimes exserted.
  - 6a. Corolla ca. 10 cm or longer, salverform with a long and narrow tube, white or with greenish midpetaline bands; seeds long pubescent at least on margin; plants large twiners.
    - 7a. Stamens inserted near mouth of corolla tube; sepals subequal or outer sepals slightly longer than inner sepals ..... 29. *I. aculeata*
    - 7b. Stamens inserted near base of corolla tube; sepals equal or outer 2 shorter than inner ones ..... 28. *I. violacea*
  - 6b. Corolla usually less than 10 cm, funnelform or campanulate, rarely salverform and then not longer than ca. 7 cm; seeds pubescent or glabrous; plants large to small twiners, or prostrate or erect.
    - 8a. Sepals hairy abaxially or with fimbriate or ciliate margin.
      - 9a. Peduncles very short ( $\leq 1.5$  cm) or absent; corolla to 1.9 cm.
        - 10a. Herbs erect to decumbent; leaf blade cuneate and attenuate basally ..... 4. *I. polymorpha*
        - 10b. Herbs twining or prostrate; leaf blade cordate basally.
          - 11a. Ovary and capsule pubescent; pedicel absent or very short, to 3 mm; outer sepals linear-acuminate from an ovate base; corolla pink or purplish, 7–9 mm ..... 1. *I. eriocarpa*
          - 11b. Ovary and capsule glabrous; pedicel 8–15 mm; outer 3 sepals deltate-lanceolate, base auriculate; corolla white, 12–19 mm ..... 2. *I. biflora*
      - 9b. Peduncles mostly longer, well developed; corolla mostly longer than 2 cm.
        - 12a. Flowers clustered at peduncle apex (capitate), subtended by 1 or more involucrate bracts.

- 13a. Leaves palmately divided nearly to base; bracts oblong; outer sepals lanceolate, apex acute; corolla funneliform, white ..... 9. *I. pes-tigridis*
- 13b. Leaves entire; bracts navicular; outer sepals elliptic-spatulate, apex obtuse; corolla salverform, pink or purple ..... 10. *I. pileata*
- 12b. Flowers clustered at apex of peduncle or not, not distinctly involucrate.
  - 14a. Sepals 4–5 mm or less ..... 14. *I. obscura*
  - 14b. Sepals ca. 5 mm or longer.
    - 15a. Erect shrubs or scandent subshrubs; sepals elliptic or ovate to circular, apex rounded, obtuse, or emarginate.
      - 16a. Sepals 13–15 mm, apex obtuse or emarginate; corolla 5.5–6.5 cm; scandent subshrubs; leaves ovate-cordate, lateral veins ca. 14 pairs ..... 26. *I. soluta*
      - 16b. Sepals 5–6 mm, apex rounded; corolla 7–9 cm; erect shrubs; leaves ovate or ovate-oblong, lateral veins 7–9 pairs ..... 27. *I. carnea*
    - 15b. Twiners or prostrate; sepals narrower, apex usually acute or acuminate, rarely obtuse.
      - 17a. Sepals long attenuate, or long and linear-acuminate apically, herbaceous; corolla bluish aging to pinkish.
        - 18a. Outer sepals lanceolate basally, with a long linear acumen, spreading hirsute basally ..... 7. *I. nil*
        - 18b. Outer sepals lanceolate to broadly lanceolate basally, long and gradually attenuate apically, appressed hairy ..... 8. *I. indica*
      - 17b. Sepals acute, acuminate, or obtuse apically, mucronulate or not, not long attenuate, herbaceous, membranous, or leathery; corolla reddish, purplish, lilac to pink, or white.
        - 19a. Outer sepals 5–10 mm, mucronulate, glabrous to pilose abaxially, margin ciliate or fimbriate; corolla 1.5–4 cm.
          - 20a. Plants with subterranean tubers; stems mostly prostrate, rarely twining, rooting at nodes, thick ..... 11. *I. batatas*
          - 20b. Plants without tubers; stems mostly twining, thinner ..... 12. *I. triloba*
        - 19b. Outer sepals 10–16 mm, not mucronulate, purplish bristly or hirsute abaxially, margin neither ciliate nor fimbriate; corolla 5–7 cm.
          - 21a. Plants ± purplish or blackish bristly on stems, petioles, inflorescences, and abaxial side of sepals; leaves deeply 3–7-lobed, lobe margin undulate-serrate ..... 23. *I. setosa*
          - 21b. Plants ± hirsute; leaves entire or shallowly 3-lobed, lobe margin entire.
            - 22a. Plants densely yellowish hirsute; stamens less than 6 mm, filaments glabrous basally; ovary 2-loculed; stigma 2-lobed ..... 5. *I. hirtifolia*
            - 22b. Plants short pubescent mixed with longer retrorse hirsute hairs; stamens unequal, longest stamens reaching middle of corolla tube, filaments pubescent basally; ovary 3-loculed; stigma 3-lobed ..... 6. *I. purpurea*
    - 8b. Sepals glabrous, sometimes muricate or dentate on veins.
      - 23a. Outer sepals with 3 dentate keels ..... 3. *I. fimbriosepala*
      - 23b. Outer sepals not keeled or dentate.
        - 24a. Sepals ca. 1.4 cm or longer.
          - 25a. Sepals subequal, gradually linear-acuminate apically ..... 8. *I. indica*
          - 25b. Sepals unequal, outer sepals rounded-obtuse apically, inner sepals acute apically ..... 20. *I. wangii*
        - 24b. Sepals less than 1.4 cm.
          - 26a. Leaves palmately lobed to palmately compound.
            - 27a. Leaves palmately parted to base; pseudostipules (small leaves of axillary shoot) often present ..... 19. *I. cairica*
            - 27b. Leaves palmately lobed to or mostly below middle, but not to base; pseudostipules absent.
              - 28a. Stems twining; sepals rounded or obtuse apically, not mucronulate.
                - 29a. Sepals ± equal or outer 2 shorter, ± circular, broadly elliptic, occasionally oblong, concave; corolla funneliform ..... 24. *I. mauritiana*
                - 29b. Sepals unequal, outer 2 longer, ovate to oblong, ± flat; corolla

- ± salverform ..... 23. *I. setosa*
- 28b. Stems prostrate, rooting at nodes; inner sepals oblong to elliptic-oblong, distinctly mucronulate.
  - 30a. Leaves herbaceous, thin, middle lobe acute or subacute; corolla pink, purple, or white; subterranean tubers present; plants cultivated, occasionally escaping ..... 11. *I. batatas*
  - 30b. Leaves fleshy, middle lobe obtuse or emarginate; corolla white with a pale yellow tube and a dark red center; without subterranean tubers; plants of sandy seashores ..... 18. *I. imperati*
- 26b. Leaves not palmately divided.
  - 31a. Plants large, woody, glabrous twiners; flowers in axillary panicles, fundamental units cymose ..... 25. *I. sumatrana*
  - 31b. Plants smaller, mostly herbaceous twiners, or prostrate plants, glabrous or pubescent; flowers in few- to several-flowered axillary cymes, or solitary in leaf axils.
    - 32a. Corolla ± salverform ..... 16. *I. marginata*
    - 32b. Corolla funnelform to campanulate.
      - 33a. Corolla to 2.5 cm ..... 14. *I. obscura*
      - 33b. Corolla ca. 3 cm or longer.
        - 34a. Plants of marshy places or aquatic, often cultivated for food (stems and leaves eaten); stems usually repent and rooting, or floating, thick, fistulose ..... 15. *I. aquatica*
        - 34b. Plants terrestrial; stems twining or repent.
          - 35a. Stems mostly (or at least partly) twining.
            - 36a. Sepals distinctly mucronulate, outer concave; corolla pink or pink-purple, with a darker center ..... 13. *I. littoralis*
            - 36b. Sepals without a mucro, outer flat; corolla blue, with a paler or white center ..... *I. tricolor*
          - 35b. Stems prostrate or trailing, mostly rooting at nodes, rarely twining, usually thick.
            - 37a. Leaves herbaceous, attenuate toward acute or obtuse apex; plants with subterranean tubers, cultivated for edible tubers ..... 11. *I. batatas*
            - 37b. Leaves ± leathery or fleshy, apex mostly obtuse to broadly rounded, or emarginate; plants without subterranean tubers.
              - 38a. Corolla white or yellowish, with a dark red center; leaves linear, lanceolate, oblong, or ovate (often on the same plant), apex obtuse or emarginate ..... 18. *I. imperati*
              - 38b. Corolla purple or reddish purple; leaves ± reniform, circular, elliptic, ovate or quadrangular to oblong, apex deeply 2-lobed or emarginate ..... 17. *I. pes-caprae*

### 1. *Ipomoea eriocarpa* R. Brown, Prodr. 484. 1810.

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*Convolvulus eriocarpus* (R. Brown) Sprengel; *C. hispidus* Vahl; *C. sessiliflorus* (Roth) Sprengel; *Ipomoea hispida* (Vahl) Roemer & Schultes; *I. horsefieldiana* Blume; *I. sessiliflora* Roth.

Herbs annual, twining or prostrate, with ± retrorsely or spreading hispid axial parts. Stems 1–2 m. Petiole 1.5–6.5 cm; leaf blade lanceolate-ovate or oblong-ovate, 3–9 × 1.5–3.5 cm, base cordate, margin entire, apex long attenuate, sometimes acute, appressed hispid; lateral veins 6 or 7 pairs. Cymes axillary, sessile or nearly so, usually 1–3-flowered; bracts linear-lanceolate, 3–8 mm, abaxially pilose. Pedicel very short or absent. Sepals ovate, ± equal, 7–9 mm, abaxially densely hirsute, apex linear-acuminate; inner sepals slightly

narrower. Corolla pink or purplish, rarely white, campanulate, 7–9 mm, midpetaline bands densely hirsute outside; limb triangular-lobed. Stamens included. Ovary hirsute, 2-loculed, 4-ovuled. Stigma capitate, 2-lobed. Capsule ± globose, 5–6 mm in diam., spreading hirsute, apiculate. Seeds gray-brown, 2.5–4 mm, glabrous, minutely reticulate.  $2n = 30$ .

Thickets, grassy slopes, open places, floodplains; 500–1100 m. Sichuan, Yunnan [Cambodia, India, Indonesia, Kashmir, Laos, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia].

### 2. *Ipomoea biflora* (Linnaeus) Persoon, Syn. Pl. 1: 183. 1805.

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*Convolvulus biflorus* Linnaeus, Sp. Pl. ed. 2., App. 1668.

1763; *Aniseia biflora* (Linnaeus) Choisy; *A. calycina* (Roxburgh) Choisy; *C. calycinus* Roxburgh; *C. hardwickii* Sprengel; *C. plebeius* (R. Brown) Sprengel; *C. ser* Sprengel; *C. sinensis* Desrousseaux; *Ipomoea calycina* (Roxburgh) Bentham ex C. B. Clarke; *I. cynanchifolia* C. B. Clarke, p.p.; *I. hardwickii* (Sprengel) Hemsley; *I. plebeia* R. Brown; *I. sinensis* (Desrousseaux) Choisy; *I. timorensis* Blume.

Herbs annual, scandent or twining, with ± grayish hirsute axial parts. Stems 1–2 m. Petiole 1.5–8 cm; leaf blade cordate or deltate-cordate, 4–9.5 × 3–7 cm, hirsute-villous, base cordate, margin entire, rarely slightly 3-lobed, apex acuminate; lateral veins 6 or 7 pairs. Inflorescences 1–3-flowered; peduncle (0–)3–15 mm; outer 3 bracts linear-lanceolate, small. Pedicel 0.8–1.5 cm. Sepals slightly enlarged in fruit; outer 3 deltate-lanceolate, 8–10 × 4–5 mm, abaxially grayish hirsute-villous, ciliate, adaxially subglabrous, base auriculate; inner 2 linear-lanceolate, ca. as long as or longer than outer 3. Corolla white, narrowly campanulate, 1.2–1.9 cm; limb shallowly lobed, midpetaline bands pubescent. Stamens ca. 3 mm; anthers ovoid-deltoid, base sagittate. Ovary conical, glabrous. Capsule ± globose, ca. 9 mm in diam., glabrous. Seeds ovoid-trigonous, ca. 4 mm, puberulent to tomentellous, margin sometimes white woolly.

Valleys, mountain slopes, roadsides, forests, usually in dry places; 200–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Taiwan, Yunnan [India, Indonesia, Japan (Ryukyu Islands), ?Myanmar, Vietnam; E Africa, N Australia].

The taxonomy of the cordate-sepaled, small-flowered ipomoeas in China needs further study. The Fl. Reipubl. Popularis Sin. account differs from other twentieth century floras in recognizing one, *Aniseia biflora*, instead of two species. The Chinese taxon has pantoporate, spinulose pollen grains, however, which indicates that it is a species of *Ipomoea*. The five known neotropical species of *Aniseia* all have nonspinulose, colporate pollen grains. The two issues not resolved in this account are whether one or two species should be recognized in China, and what names are to be applied to them.

Twentieth century floras for Africa, Asia, and Malesia recognize two species of small-flowered *Ipomoea* with cordate sepals: *I. plebeia* and *I. sinensis*. Several authors have pointed out that the original description of the Linnaean *Convolvulus biflorus* is ambiguous, and in the absence of any type specimen (at the herbaria LINN or S), they have reduced *C. biflorus* to the synonymy of Robert Brown's clearly defined and typified *I. plebeia*. Chinese specimens called *I. (Aniseia) biflora* come very near to what has been called *I. plebeia* in contemporary African and Malesian floras.

*Ipomoea sinensis*, which occurs through much of the Old World tropics, is distinguished primarily by having peduncles to 4.5 cm long. The Fl. Reipubl. Popularis Sin. placed it in synonymy of *Aniseia biflora*. For the time being, the epithet *biflora*, which is well established in the Chinese literature, is here maintained to a single highly variable taxon defined much as in the Fl. Reipubl. Popularis Sin. A careful study of the entire complex of cordate-sepaled *Ipomoea* needs to be undertaken, however, to sort out the identities and nomenclature for the taxa involved.

The whole plant has several medicinal uses.

### 3. *Ipomoea fimbriosepala* Choisy in A. de Candolle, Prodr. 9: 359. 1845.

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*Aniseia hastata* Meissner; *A. stenantha* (Dunn) Ling ex

R. C. Fang & S. H. Huang; *A. stenantha* var. *macrostephana* Y. H. Zhang; *Ipomoea setifera* Poiret var. *fimbriosepala* (Choisy) Fosberg; *I. stenantha* Dunn.

Herbs twining, with glabrous or hirsute axial parts. Stems glabrous or nodes hirsute. Petiole 1–5 cm, sometimes minutely tuberculate; leaf blade cordate-sagittate to narrowly hastate, 5–12 × 1–6 cm, glabrous, apex acuminate, mucronulate; lateral veins 5 or 6 pairs. Inflorescences axillary, 1- to few flowered; peduncle 5(–9) cm or shorter; bracts 2, ± ovate, 0.5–1.5 cm, glabrous. Pedicel angular, 1.3–3.5 cm. Sepals unequal; outer 3 larger, attenuate-ovate to lanceolate, 1.5–2.2 cm, margin incurved, apex mucronate, strongly 3-keeled abaxially, keels toothed basally, glabrous. Corolla purplish to red, with a darker center, narrowly funneliform, 2.5–4 cm, glabrous. Stamens included; filaments pilose below middle. Ovary conical, glabrous. Style filiform, ca. 5 mm; stigma capitate, 2-lobed. Capsule pale brown outside, whitish inside, ovoid to globose, 1–1.5 cm. Seeds black-brown, ovoid, ca. 5 mm, densely tomentellous.

Grasslands. Fujian, Guangdong, Zhejiang [New Guinea; Africa, North America (Mexico), Pacific Islands, South America].

*Ipomoea fimbriosepala* is very similar in all respects to *I. setifera* Poiret, which is reported to have corollas 6–7 cm long and wider leaves. Chinese specimens come nearer to the descriptions for the former species. Fosberg (Smithsonian Contr. Bot. 36: 24. 1977) reduced *I. fimbriosepala* to a variety of *I. setifera*, but Austin (Fl. Venezuela 8(3): 159. 1982) maintained it as a distinct species. *Ipomoea stenantha* is placed here in the synonymy of *I. fimbriosepala* for the first time.

### 4. *Ipomoea polymorpha* Roemer & Schultes, Syst. Veg. 4: 254. 1819.

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*Convolvulus defloratus* Choisy; *C. nolaniflorus* Zippelius ex Spanoghe; *C. robertianus* Sprengel; *Ipomoea heterophylla* R. Brown; *I. pumila* Spanoghe; *I. tashiroi* Matsumura.

Herbs annual. Stems erect to decumbent, simple or branched basally, 8–60 cm; branchlets densely pilose, ± glabrescent. Petiole 0.5–7 mm, sparsely pilose; leaf blade entire, coarsely dentate, or irregularly pinnatifid with few segments, usually 3-cleft; middle segment linear-lanceolate, 2–2.5 cm × 2–3 mm; lateral segments broadly linear, 4–8 × 1–2 mm, sparsely pilose and ciliate, base cuneate and attenuate. Flowers solitary, axillary; bracts linear, 1–2 cm, villous. Peduncles and pedicels very short or absent. Sepals with a distinct midvein, 8–10 mm, pubescent, apex long acuminate; outer ovate-lanceolate, entire or with 1 or 2 teeth at margin; inner ones lanceolate. Corolla red-purple or rarely white, tubular-funneliform, ca. 1.3 cm, glabrous. Stamens included. Ovary and style glabrous. Capsule enclosed in calyx, globose, ca. 5 mm, 2-loculed, 4-valved. Seeds ca. 3 mm, gray-brown tomentellous.

Grasslands, sandy seashores; below 100 m. Hainan, Taiwan [Cambodia, ?India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, New Guinea, Philippines, Vietnam; Africa, NE Australia].

### 5. *Ipomoea hirtifolia* R. C. Fang & S. H. Huang, Fl. Xizang. 4: 28. 1985.

粗毛薯藤 cu mao shu teng

Herbs twining, with ± densely yellowish hirsute axial parts. Stems sparsely retrorse hirsute. Petiole 3–4 cm; leaf blade cordate, 4.5–5.5 × 3.5–4 cm, yellowish hirsute, apex acuminate. Inflorescences axillary, 1–5-flowered; peduncles ca. as long as petioles; bracts lanceolate, 7–10 mm. Pedicel ca. 1.5 cm. Sepals lanceolate-ovate, subequal, ca. 1.5 cm, abaxially sparsely hirsute, apex acuminate. Corolla reddish purple, funnelform, ca. 5 cm, glabrous outside. Stamens included, very short; filaments glabrous basally; anthers ellipsoid, ca. 4 mm. Disc ringlike. Pistil included; ovary conical, acuminate, 2-loculed, 4-ovulate. Style filiform; stigma 2-globose. Fruit unknown. Fl. Jul.

- Growing over shrubs in a valley; ca. 2100 m. Xizang (Gyirong Xian).

Seemingly distinguished from other species of *Ipomoea* by the dense, yellowish hirsute indumentum on all vegetative parts and short glabrous filaments. The fruits of this species are as yet unknown, and when they are discovered it may prove that this is actually an *Argyreia*. A number of yellowish hirsute species of *Argyreia* with purple-red flowers are known from the Indian subcontinent and northern Myanmar that could well range into Xizang. Only further collections will illuminate the true generic relationships of this species.

**6. *Ipomoea purpurea* (Linnaeus) Roth, Bot. Abb. 27. 1787.**

圆叶牵牛 yuan ye qian niu

*Convolvulus purpureus* Linnaeus, Sp. Pl. ed. 2. 1: 219. 1762; *Ipomoea chonetii* H. Léveillé; *I. hispida* Zuccarini; *Pharbitis hispida* Choisy; *P. purpurea* (Linnaeus) Voigt.

Herbs annual, twining; axial parts short pubescent and long retrorse hirsute. Stems 2–3 m. Petiole 2–12 cm; leaf blade circular-ovate or broadly ovate, 4–18 × 3.5–16.5 cm, ± strigose, base cordate, margin entire or ± 3-lobed, apex acute or ± abruptly acuminate. Inflorescences 1–5-flowered; peduncle 4–12 cm; bracts linear, 6–7 mm, spreading hirsute. Pedicel recurved before and after anthesis, 1.2–1.5 cm. Sepals subequal, 1.1–1.6 cm, spreading hirsute abaxially in basal 1/2; outer 3 oblong, apex acuminate; inner 2 linear-lanceolate. Corolla red, reddish purple, or blue-purple, with a fading to white center, funnelform, 4–6 cm, glabrous. Stamens included, unequal; filaments pubescent basally. Pistil included; ovary glabrous, 3-loculed. Stigma 3-lobed. Capsule subglobose, 9–10 mm in diam., 3-valved. Seeds black or straw colored, ovoid-trigonous, glabrous or hilum sparsely pilose.  $2n = 30, 32$ .

Waysides, hedges, fields; 0–2800 m, cultivated or escaped. Most provinces of China [Indonesia, Nepal, Pakistan, Philippines, Sri Lanka; native of North and South America, introduced and naturalized worldwide].

The seeds are used medicinally.

**7. *Ipomoea nil* (Linnaeus) Roth, Catal. Bot. 1: 36. 1797.**

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*Convolvulus nil* Linnaeus, Sp. Pl. ed. 2. 1: 219. 1762;

*C. hederaceus* Linnaeus; *Ipomoea hederacea* (Linnaeus) Jacquin; *I. nil* var. *setosa* (Blume) Boerlage; *I. scabra* Forsskål; *I. setosa* Blume; *I. trichocalyx* Steudel; *I. vaniotiana* H. Léveillé; *Pharbitis nil* (Linnaeus) Choisy.

Herbs annual, twining, with retrorsely hirsute axial parts. Stems 2–5 m. Petiole 2–15 cm; leaf blade broadly ovate or nearly circular, 4–15 × 4.5–14 cm, hirtellous, base cordate, margin entire or ± 3- (or 5)-lobed, apex acuminate. Inflorescences axillary, 1- to few flowered; peduncle 1.5–18.5 cm; bracts linear or filiform, 5–8 mm, spreading hirtellous. Pedicel 2–7 mm. Sepals lanceolate, ± equal, 1–2.5 cm, abaxially spreading hirsute, subglabrous apically, with a linear acumen, hairs swollen based. Corolla pale to bright blue with whitish tube, fading to pinkish in age, funnelform, 5–6(–8) cm, glabrous. Stamens included, unequal. Pistil included; ovary glabrous, 3-loculed. Stigma 3-lobed. Capsule straw colored, ovoid to ± globose, 8–10 mm in diam., glabrous. Seeds black, ovoid-trigonous, 5–6 mm, gray puberulent.  $2n = 30^*$ .

Thickets on mountain slopes, waysides, fields, hedges; 0–1600 m. Cultivated or escaped. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [?Japan (Ryukyu Islands), Kashmir, Myanmar, Nepal, New Guinea, Pakistan, Sri Lanka, Thailand; native of South America, now nearly circumtropical].

The seeds have a number of local medicinal uses.

**8. *Ipomoea indica* (J. Burman) Merrill, Interpr. Herb. Amboin. 445. 1917.**

变色牵牛 bian se qian niu

*Convolvulus indicus* J. Burman, Index Univ. Herb. Amb. 7: 6. 1755; *C. acuminatus* Vahl; *C. congestus* (R. Brown) Sprengel; *Ipomoea acuminata* (Vahl) Roemer & Schultes; *I. amoena* Blume; *I. cataractae* Endlicher; *I. cathartica* Poiret; *I. congesta* R. Brown; *I. insularis* (Choisy) Steudel; *I. kiuninsularis* Masamune; *I. learii* Paxton; *I. mutabilis* Lindley; *Parasitipomoea formosana* Hayata; *Pharbitis acuminata* (Vahl) Choisy; *P. acuminata* var. *congesta* (R. Brown) Choisy; *P. cathartica* (Poiret) Choisy; *P. indica* (J. Burman) R. C. Fang; *P. insularis* Choisy; *P. learii* (Paxton) Lindley.

Herbs twining or sometimes prostrate, with ± densely retrorse pilose axial parts. Stems 3–6 m, sometimes rooting at nodes. Petiole 2–18 cm; leaf blade ovate or circular, 5–15 × 3.5–14 cm, abaxially densely short, soft, pubescent, adaxially ± sparsely pubescent, base cordate, margin entire or ± 3-lobed, apex acuminate or abruptly acuminate. Inflorescences dense umbellate cymes, several flowered; peduncle 4–20 cm; bracts linear, sometimes lanceolate. Pedicel 2–5(–8) mm. Sepals subequal, 1.4–2.2 cm, gradually linear-acuminate apically, glabrous to appressed pilose; outer 3 lanceolate to broadly lanceolate; inner 2 narrowly lanceolate. Corolla bright blue or bluish purple, aging reddish purple or red, with a paler center, funnelform, 5–8 cm, glabrous. Stamens included. Pistil included; ovary glabrous. Stigma 3-lobed. Capsule ± globose, 1–1.3 cm in diam. Seeds ca. 5 mm.  $2n = 30^*$ .

Coastal habitats, moist forests, weedy; 0–500 m. Guangdong, Nanhai Zhudao, Taiwan [Indonesia, Japan, Malaysia, Myanmar, New Guinea, Pakistan, Philippines, Sri Lanka; Pacific Islands, native of South America, now circumtropical as a cultivated and naturalized plant].

Fosberg (Bot. Not. 129: 35–38. 1976) has sorted out the complicated nomenclature for this pantropical species and established that *Ipomoea indica* is the correct name for it.

**9. *Ipomoea pes-tigridis* Linnaeus, Sp. Pl. 1: 162. 1753.**

虎掌藤 hu zhang teng

*Convolvulus pes-tigridis* (Linnaeus) Sprengel; *Ipomoea capitellata* Choisy; *I. hepaticifolia* Linnaeus.

Herbs annual, twining, with spreading hispid axial parts. Stems 0.5–3 m. Petiole 2–8 cm; leaf blade circular or transversely elliptic in outline, 2–10 × 3–13 cm, palmately deeply divided; segments (3–)5–9, elliptic or oblong, tapered at both ends, densely pubescent, apex mucronate. Inflorescences capitate, few flowered; peduncle 4–11 cm; bracts hirsute; outer involucral bracts oblong to linear-oblong, 2–2.5 cm; inner bracts smaller. Pedicel obsolete. Sepals lanceolate, slightly unequal, 1–1.4 cm, hirsute on both sides. Corolla white, funnelform, 3–4 cm, midpetaline bands sparsely pubescent. Stamens included; filaments glabrous. Pistil included; ovary 2-loculed, glabrous. Stigma 2-lobed. Capsule ovoid, ca. 7 mm, 4-valved. Seeds ellipsoid, ca. 4 mm, gray tomentellous.  $2n = 28, 30$ .

Hedges, roadsides, seashores; 0–400 m. Guangdong, S Guangxi, Hainan, Taiwan, S Yunnan [Cambodia, Indonesia, Kashmir, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific Islands].

**10. *Ipomoea pileata* Roxburgh, Fl. Ind. 2: 94. 1824.**

帽苞薯藤 mao bao shu teng

*Convolvulus pileatus* (Roxburgh) Sprengel.

Herbs annual, twining, with ± densely retrorse hispid-pilose axial parts. Stems 1–2 m. Petiole 1.5–6 cm; leaf blade cordate-ovate, 2.5–9 × 2.5–7.5 cm, pilose, more densely so abaxially, base cordate, margin entire, apex acuminate or attenuate. Inflorescences capitate, few to several flowered; peduncle 1.5–7 cm; involucral bracts navicular, tapered at both ends, 2.7–5.5 cm, outside densely pubescent, inside long hirtellous; bracteoles oblong-spatulate, much smaller, villous. Sepals subequal, 8–10 mm; outer 3 elliptic-spatulate; inner 2 narrower, lanceolate, villous, apex obtuse. Corolla pink or purple, salverform, 2.5–3 cm; tube cylindric; limb with deltate lobes, midpetaline bands pilose. Stamens inserted near middle of corolla tube. Ovary glabrous. Capsule ± globose, 5–6 mm in diam. Seeds dark brown, 3–4 mm, glabrous or short pubescent.

Edges of forests, clearings on mountain slopes, roadsides, grasslands; 100–1000 m. Guangdong, Guangxi, Hainan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Philippines, Sri Lanka, Thailand, Vietnam; Africa].

**11. *Ipomoea batatas* (Linnaeus) Lamarck, Encycl. 2: 465.**

1793.

番薯 fan shu

*Convolvulus batatas* Linnaeus, Sp. Pl. 1: 154. 1753; *Batatas edulis* (Thunberg ex Murray) Choisy; *C. candidans* Solander ex Sims; *C. edulis* Thunberg ex Murray; *Ipomoea batatas* var. *edulis* (Thunberg ex Murray) Makino; *I. batatas* var. *lobata* Gagnepain & Courchet; *I. edulis* (Thunberg ex Murray) Makino; *I. fastigiata* Sweet.

Herbs annual, with ellipsoid, fusiform, or elongated subterranean tubers; sap milky; axial parts glabrous or pilose. Stems prostrate or ascending, rarely twining, green or purplish, much branched, rooting at nodes. Petiole 2.5–20 cm; leaf blade broadly ovate to circular, 4–13 × 3–13 cm, margin entire or palmately 3–5(–7)-lobed, herbaceous; lobes broadly ovate to linear-lanceolate, sparsely pilose or glabrous. Inflorescences 1- or 3–7-flowered; peduncle 2–10.5 cm, stout, angular; bracts early deciduous, lanceolate, 2–4 mm. Pedicel 2–10 mm. Sepals oblong or elliptic, ± unequal, glabrous or pilose abaxially, margin ciliate, apex acute, mucronulate, outer 2 sepals 7–10 mm, inner 3 sepals 8–11 mm. Corolla pink, white, pale purple to purple, with a darker center, campanulate to funneliform, 3–4 cm, glabrous. Stamens included. Pistil included; ovary pubescent or glabrous. Capsule rarely produced, ovoid or depressed globose. Seeds glabrous.  $2n = 84, 90^*$ .

Cultivated throughout China, sometimes persisting from cultivation, but doubtfully naturalized [Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, North America, Pacific Islands, South America, cultivated worldwide].

*Ipomoea batatas* is a productive and adaptable crop. Its tubers are an important source of food, starch, and raw material for producing alcohol. The stems and leaves can be used as livestock forage. In ancient Chinese texts, the name now used for “sweet potato” refers to *Dioscorea alata* Linnaeus, and not this species.

**12. *Ipomoea triloba* Linnaeus, Sp. Pl. 1: 161. 1753.**

三裂叶薯 shan lie ye shu

*Batatas triloba* (Linnaeus) Choisy; *Convolvulus trilobus* (Linnaeus) Desrousseaux; *Ipomoea blancoi* Choisy.

Herbs annual. Stems twining or prostrate, glabrous or nodes sparsely pubescent. Petiole 2.5–6 cm, glabrous, sometimes tuberculate; leaf blade broadly ovate to circular in outline, 2.5–7 × 2–6 cm, glabrous or sparsely pilose, base cordate, margin entire or coarsely dentate to deeply 3-lobed. Inflorescences dense umbellate cymes, 1- to several flowered; peduncle 2.5–5.5 cm, glabrous, angular, verruculose distally; bracts lanceolate-oblong, minute. Pedicel 5–7 mm, ± angular, glabrous, verruculose. Sepals slightly unequal, 5–8 mm, glabrous or sparsely pilose abaxially, margin fimbriate, apex obtuse or acute, mucronulate; outer 2 oblong, slightly shorter; inner 3 elliptic-oblong. Corolla pink or pale purple, funnelform, 1.5–2 cm, glabrous; limb obtusely 5-lobed. Stamens included. Pistil included; ovary pubescent. Stigma 2-lobed. Capsule ± globular, 5–6 mm, bristly pubescent, apiculate, 2-loculed, 4-valved. Seeds dark brown, ca. 3.5 mm, glabrous.  $2n = 30$ .

Roadsides or fields; 0–800 m. Anhui, Guangdong, S Shaanxi,

Taiwan, Zhejiang [Indonesia, Japan (Ryukyu Islands), Malaysia, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; North America (native to the West Indies), Pacific Islands, now a circumtropical weed].

**13. *Ipomoea littoralis* (Linnaeus) Blume, Bijdr. 713. 1825.**

南沙薯藤 nan sha shu teng

*Convolvulus littoralis* Linnaeus, Syst. Nat. (ed. 10) 924. 1759; *C. denticulatus* Desrousseaux; *Ipomoea denticulata* (Desrousseaux) Choisy, non R. Brown.

Herbs perennial. Stems prostrate, rooting at nodes, or twining, slender, mostly glabrous. Petiole 0.5–7 cm; leaf blade ovate to oblong, occasionally circular or reniform, 1–10 × 1–7.5 cm, glabrous or nearly so, base cordate, margin entire or minutely undulate to angular, or ± 3-lobed, apex acute, obtuse or emarginate, mucronulate. Inflorescences usually 1-(less often few) flowered; peduncle 0.1–3 cm; bracts early deciduous, 1–2 mm. Pedicel 1–4 cm, glabrous. Sepals unequal, glabrous; outer 2 concave, oblong-elliptic, 6–10 mm, apex acute to obtuse; inner 3 elliptic to nearly circular, 0.8–1.2 cm. Corolla pink or pink-purple, with a darker center, funnelform, 3–4.5 cm, glabrous. Stamens included; filaments unequal, glandular pubescent on basal 1/2. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule depressed-globose, ca. 9 mm in diam. Seeds black, ovoid, 3.5–4 mm, glabrous.  $2n = 30, 60$ .

Sandy seashores, coastal thickets, forest floors; 0–100 m. Nanhai Zhudao, Taiwan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Pacific Islands].

Long confused with *Ipomoea gracilis* R. Brown, a distinct species that is endemic to Australia; the nomenclature, distribution, and ethnobotanical significance of *I. littoralis* have been discussed by Austin (Econ. Bot. 45: 251–256. 1991).

According to Xing et al. (Guizhou 14: 151–156. 1994) and Huang et al. (Taiwania 39: 1–26. 1994), *Ipomoea gracilis* R. Brown occurs on the South China Sea Islands (Nanhai Zhudao); however, material was not available for study. It is likely that the plants collected belong to *I. littoralis*, and not *I. gracilis*.

**14. *Ipomoea obscura* (Linnaeus) Ker Gawler, Bot. Reg. 3: t. 239. 1817.**

小心叶薯 xiao xin ye shu

*Convolvulus obscurus* Linnaeus, Sp. Pl. ed. 2., 2: 220. 1762; *Ipomoea insuavis* Blume; *I. luteola* R. Brown.

Herbs twining; axial parts glabrous, spreading pubescent, or almost woolly. Stems thinly angular, 1–2 m. Petiole 1.5–3.5 cm; leaf blade cordate-circular or ovate, occasionally reniform, 2–8 × 1.6–8 cm, glabrous or sparsely pilose, base cordate, margin entire or minutely undulate, apex attenuate, acute. Inflorescences 1–3-flowered; peduncle almost filiform, 1.4–4 cm; bracts subulate, ca. 1.5 mm. Pedicel 0.8–2 cm, subglabrous, thickened and recurved in fruit distally. Sepals reflexed in fruit, elliptic-ovate, subequal, 4–5 mm, glabrous or ± pubescent, mucronulate, outer ones whitish margined. Corolla white or pale yellow, with darker midpetaline bands and a purple center, funnelform, 2–2.5 cm. Stamens included; filaments very unequal. Pistil included; ovary glabrous.

Stigma 2-lobed. Capsule conical-ovoid or ± globose, 6–8 mm in diam., apiculate. Seeds black-brown, 4–5 mm, densely gray-brown tomentellous.  $2n = 30$ .

Weedy in thickets, open forests, sandy places, seashores; 0–1600 m. Guangdong, Hainan, Nanhai Zhudao, Taiwan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, ?Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; E Africa, N Australia, Pacific Islands].

**15. *Ipomoea aquatica* Forsskål, Fl. Aegypt.-Arab. 44. 1775.**

蕹菜 weng cai

*Convolvulus repens* Vahl; *Ipomoea repens* Roth; *I. reptans* Poiret; *I. subdentata* Miquel.

Herbs annual, terrestrial and repent or floating; axial parts glabrous. Stems terete, thick, hollow, rooting at nodes. Petiole 3–14 cm, glabrous; leaf blade variable, ovate, ovate-lanceolate, oblong, or lanceolate, 3.5–17 × 0.9–8.5 cm, glabrous or rarely pilose, base cordate, sagittate or hastate, occasionally truncate, margin entire or undulate, apex acute or acuminate. Inflorescences 1–3(–5)-flowered; peduncle 1.5–9 cm, base pubescent; bracts squamiform, 1.5–2 mm. Pedicel 1.5–5 cm. Sepals subequal, glabrous; outer 2 ovate-oblong, 7–8 mm, margin whitish, thin, apex obtuse, mucronulate; inner 3 ovate-elliptic, ca. 8 mm. Corolla white, pink, or lilac, with a darker center, funnelform, 3.5–5 cm, glabrous. Stamens unequal, included. Pistil included; ovary conical, glabrous. Stigma 2-lobed. Capsule ovoid to globose, ca. 1 cm in diam., woody, tardily dehiscent or ?indehiscent. Seeds densely grayish pubescent, sometimes glabrous.  $2n = 30^*$ .

Marshy habitats: ditches, ponds, rice paddies, waste areas. C to S China, native and cultivated [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific Islands, South America].

Commonly cultivated as a pot herb, *Ipomoea aquatica* is adapted to a warm, moist climate and cannot survive frost. Several races are recognized (without formal taxonomic designation) based on growing conditions (terrestrial vs. aquatic) and plant and flower color (greenish plants with white flowers vs. purplish tinged plants with lilac flowers). The plants have minor medicinal uses and also are used for forage.

**16. *Ipomoea marginata* (Desrousseaux) Verdcourt, Kew Bull. 42: 658. 1987.**

毛茎薯 mao jing shu

*Convolvulus marginatus* Desrousseaux in Lamarck, Encycl. Meth. 3: 558. 1792; *C. verrucosus* (Blume) D. Dietrich; *Ipomoea sepiaria* Koenig ex Roxburgh; *I. subtrilobans* Miquel; *I. verrucosa* Blume.

Herbs perennial, with a stout root and spreading hirsute or glabrous axial parts. Stems twining or prostrate, 1–3 m. Petiole 1–3 cm, sometimes minutely tuberculate; leaf blade often purple or purple spotted, elliptic-ovate or reniform to circular, apical leaves sometimes sagittate or hastate, 2–6 × 2–5 cm, glabrous, ciliolate marginally, base deeply cordate or hastate, margin entire or minutely undulate, apex attenuate or ± abruptly acuminate. Inflorescences few to several

flowered; peduncle 2–8 cm, thick, often applanate, verruculose distally; bracts persistent, ovate or oblong, ca. 2 mm. Pedicel 5–6 mm, sparsely verruculose. Sepals ovate or elliptic-oblong, equal or inner 3 longer, 4–7 mm, glabrous, apex obtuse; outer 2 verruculose, margin thinner. Corolla white or purple, with a darker center, ± salverform, 2.5–4 cm; lobes 5, apiculate. Stamens included. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule depressed-globose, 6–7 mm, glabrous. Seeds pale grayish white tomentellous, margin often with longer cobwebby hairs.

Coastal or saline soils, thickets, grasslands, fields and waste areas. Hainan, Taiwan [India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, ?Pakistan, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Pacific Islands].

*Ipomoea marginata* has often been misidentified as *I. maxima* (Linnaeus f.) Sweet.

**17. *Ipomoea pes-caprae* (Linnaeus) R. Brown in Tuckey, Narr. Exped. Zaire 477. 1818.**

厚藤 hou teng

*Convolvulus pes-caprae* Linnaeus, Sp. Pl. 1: 159. 1753; *C. bilobatus* Roxburgh; *C. brasiliensis* Linnaeus; *C. maritimus* Desrousseaux; *Ipomoea biloba* Forsskål; *I. brasiliensis* (Linnaeus) G. Meyer; *I. brasiliensis* (Linnaeus) Sweet; *I. maritima* (Desrousseaux) R. Brown; *I. pes-caprae* var. *emarginata* H. Hallier; *I. pes-caprae* subsp. *brasiliensis* (Linnaeus) Ooststroom.

Herbs perennial, glabrous, with a thick tap root. Stems 5–30 m, prostrate, sometimes twining, rooting at nodes. Petiole 2–10 cm; leaf blade ovate, elliptic, circular, reniform or ± quadrate to oblong, 3.5–9 × 3–10 cm, rather thick, 2-glandular abaxially, base broadly cuneate, truncate, or shallowly cordate, margin entire, apex emarginate or deeply 2-lobed, mucronulate. Inflorescences 1- to several flowered; peduncle stout, 4–14 cm; bracts early deciduous, broadly deltate, 3–3.5 mm. Pedicel 2–2.5 cm. Sepals unequal, ± leathery, glabrous, apex obtuse, mucronulate; outer 2 ovate to elliptic, 5–8 mm, wider; inner 3 nearly circular and concave, 7–11 mm. Corolla purple or reddish purple, with a darker center, funneliform, 4–5 cm. Stamens included. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule ± globular, 1.1–1.7 cm, glabrous, leathery. Seeds black, trigonous-globose, 7–8 mm, densely brownish tomentose.  $2n = 30^*$ .

Sandy seashores, open fields near seashores; 0–100 m. Fujian, Hainan, Taiwan, Zhejiang [Cambodia, Indonesia, Japan including Ryukyu Islands, Malaysia, Myanmar, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Australia, North America, Pacific Islands, South America; pantropical littoral species].

According to Xing et al. (Guiahaia 14: 151–156. 1994), *Ipomoea pes-caprae* occurs on the South China Sea Islands (Nanhai Zhudao), but no material was available for this account.

Although van Ooststroom (Blumea 3: 532–539. 1940) recognized two subspecies based on the depth of apical lobing of the leaf blades, none is accepted here. The change in growing conditions can produce variation in leaf lobing on the same plant.

Useful as a medicinal plant (for treating colds, arthritis, and back pain), forage crop, and as a sand binder in coastal areas.

**18. *Ipomoea imperati* (Vahl) Grisebach, Cat. Pl. Cub. 203. 1866.**

假厚藤 jia hou teng

*Convolvulus imperati* Vahl, Symb. Bot. 1: 17. 1790; *Batatas acetosifolia* (Vahl) Choisy; *B. littoralis* (Linnaeus) Choisy; *Convolvulus acetosifolius* Vahl; *C. littoralis* Linnaeus; *C. sinuatus* Petagna; *C. stoloniferus* Cirillo; *Ipomoea acetosifolia* (Vahl) Roemer & Schultes; *I. carnea* R. Brown; *I. littoralis* (Linnaeus) Boissier; *I. stolonifera* (Cirillo) J. F. Gmelin.

Herbs perennial, glabrous. Stems trailing, to 5 m, rooting at nodes. Petiole 0.5–4.5 cm; leaf blade variable, often linear, lanceolate, oblong, or ovate on same plant, 1.5–3 × 0.8–2 cm, rather fleshy, base truncate or shallowly cordate, margin entire, undulate, or 3–5-lobed; middle lobe ovate to oblong, lateral lobes smaller, apex obtuse or emarginate to 2-lobed. Flowers usually solitary, occasionally 2 or 3 together; peduncle ca. 2 cm; bracts deltate, ca. 2 mm. Pedicel 0.7–1.5 cm, stout. Sepals oblong, unequal, ± leathery, glabrous, apex obtuse or acute, mucronulate; outer 2 sepals 7–11 mm; inner ones to 1.5 cm. Corolla white, with a pale yellow tube and a dark red center, funneliform, 3.5–4 cm, glabrous. Stamens included. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule ± globose, ca. 1 cm, smooth, glabrous. Seeds ca. 8 mm, tomentose, margin with longer hairs.  $2n = 30$ .

Coastal sandy beaches, dunes, grasslands; 0–100 m. Fujian, Guangdong, S Guangxi, Hainan, Taiwan [Indonesia, Japan (Ogasawara and Ryukyu Islands), Malaysia, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Europe, North America, Pacific Islands; a pantropical and warm temperate littoral species].

La Valva and Sabato (Taxon 32: 110–114. 1983) have established that *Ipomoea stolonifera* (Cirillo) J. F. Gmelin, the name by which this species has long been known, is illegitimate, because it is based on the same type as the earlier *Convolvulus sinuatus* Petagna. Unfortunately, the latter epithet cannot be taken up in *Ipomoea* because of the later *I. sinuata* Ortega.

**19. *Ipomoea cairica* (Linnaeus) Sweet, Hort. Brit., ed. 1, 287. 1827.**

五爪金龙 wu zhao jin long

Herbs perennial, twining, with a tuberous root; axial parts ?glabrous. Stems to 5 m, thinly angular, ± tuberculate or smooth. Petiole 2–8 cm, base with leafy pseudostipules; leaf blade palmately 5-parted to base; lobes entire or minutely undulate, apex acute or obtuse, mucronulate, basal pair usually again lobed or parted; middle lobe larger, ovate, ovate-lanceolate, or elliptic, (2.5)–4–5 × (0.5)–2–2.5 cm. Inflorescences 1- or several flowered; peduncle 2–8 cm; bracts and bracteoles early deciduous, squamiform, small. Pedicel 0.5–2 cm, sometimes verruculose. Sepals unequal; outer 2 sepals 4–6.5 mm; inner ones 5–9 mm, glabrous, abaxially ± verruculose, margin paler, scarious. Corolla pink, purple, or reddish purple, with a darker center, rarely white, funneliform, (2.5)–5–7 cm. Stamens included, unequal. Ovary glabrous. Stigma 2-lobed. Capsule ± globose, ca. 1 cm. Seeds black, ca. 5 mm, densely tomentose, margin with longer hairs.  $2n = 30^*$ .

Origin unknown, now distributed nearly pantropically: Africa, Asia, Pacific Islands, South America.

- 1a. Middle lobe of leaf blade  $4\text{--}5 \times 2\text{--}2.5$  cm;  
corolla  $5\text{--}7$  cm ..... 19a. var. *cairica*  
1b. Middle lobe of leaf blade  $2.5\text{--}3.3 \times 0.5\text{--}1$  cm;  
corolla  $2.5\text{--}3.5$  cm ..... 19b. var. *gracillima*

**19a. *Ipomoea cairica* var. *cairica***

五爪金龙 (原变种) wu zhao jin long (yuan bian zhong)

*Convolvulus cairicus* Linnaeus, Syst. Nat. (ed. 10) 2: 922. 1759; *C. tuberculatus* Desrousseaux; *Ipomoea palmata* Forsskål; *I. stipulacea* Jacquin; *I. tuberculata* (Desrousseaux) Roemer & Schultes.

Middle lobe of leaf  $4\text{--}5 \times 2\text{--}2.5$  cm. Corolla  $5\text{--}7$  cm.

Thickets, roadsides, waste places, cultivated areas, sunny meadows in lowlands; 100–600 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Pacific Islands, South America].

The entire plant is used for treating external infections.

**19b. *Ipomoea cairica* var. *gracillima*** (Collett & Hemsley) C. Y. Wu, Rep. Stud. Pl. Trop. Subtrop. Yunnan 1: 120. 1965.

纤细五爪金龙 qian xi wu zhao jin long

*Ipomoea palmata* Forsskål var. *gracillima* Collett & Hemsley, J. Linn. Soc., Bot. 31: 97. 1890; *I. gracillima* (Collett & Hemsley) Prain.

Middle lobe of leaf  $2.5\text{--}3.3 \times 0.5\text{--}1$  cm. Corolla  $2.5\text{--}3.5$  cm.

Stony grassy slopes, sunny mountainsides; 1700–2000 m. NW Yunnan [Myanmar].

**20. *Ipomoea wangii*** C. Y. Wu, Rep. Stud. Pl. Trop. Subtrop. Yunnan 1: 118. 1965.

大萼山土瓜 da e shan tu gua

Herbs climbing, glabrous. Stems terete, thinly angular. Petiole 4.5–9 cm; leaf blade circular-cordate,  $6\text{--}14 \times 4\text{--}10$  cm, base narrowly cordate, entire, apex abruptly acuminate; lateral veins 6 or 7 pairs, arcuate ascending. Inflorescences few flowered; peduncle 1–2 cm. Pedicel 2–3 cm, thickened apically. Sepals narrowly ovate, unequal, glabrous; outer ones  $1.5\text{--}1.7 \times 1\text{--}1.2$  cm, apex rounded-obtuse; inner ones  $1.7\text{--}1.9$  cm, apex acute. Corolla funnelform, ca. 7.7 cm, glabrous. Stamens included. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule unknown. Fl. Nov.

• Thickets, waysides; ca. 900 m. Yunnan.

**21. *Ipomoea alba*** Linnaeus, Sp. Pl. 1: 161. 1753.

月光花 yue guang hua

*Calonyction aculeatum* (Linnaeus) House; *C. aculeatum* var. *lobatum* (H. Hallier) C. Y. Wu; *C. album* (Linnaeus) House; *C. bona-nox* (Linnaeus) Bojer; *C. bona-nox* var. *lobata* H. Hallier; *C. speciosum* Choisy; *Convolvulus aculeatus* Linnaeus; *Ipomoea aculeata* (Linnaeus) Kuntze; *I. aculeata* var. *bona-nox* (Linnaeus) Kuntze; *I. bona-nox* Linnaeus.

Herbs annual or perennial, twining, usually glabrous, rarely puberulent. Stems to 10 m, terete, smooth or with soft prickles, sap milky. Petiole 5–20 cm; leaf blade ovate to ± circular in outline,  $10\text{--}20 \times 5\text{--}16$  cm, base cordate, margin entire, angular to 3-lobed, apex acuminate, mucronulate. Inflorescences helicoid cymes, rarely dichasial, 1- to several flowered; peduncle stout, terete, 1–24 cm; bracts early deciduous, small. Pedicel 7–15 cm, clavate distally, enlarged in fruit. Flowers nocturnal, fragrant. Sepals elliptic to ovate, ± leathery, glabrous; outer 3 sepals 5–12 mm, apex with a stout spreading awn 4–9 mm; inner 2 sepals 7–15 mm, mucronate. Corolla white, with greenish bands, salverform; tube 7–12 cm, ca. 5 mm in diam.; limb 7–12 cm in diam., shallowly 5-undulate. Stamens exserted; filaments inserted in apical 1/2 of corolla tube, glabrous; anthers sagittate basally. Pistil exserted; ovary narrowly conical, glabrous. Stigma 2-lobed. Capsule ovoid, 2.5–3 cm, apiculate. Seeds white, brown, or black, ca.  $10 \times 7\text{--}8$  mm, glabrous.  $2n = 28^*, 30^*, 38^*$ .

Wet forests, watercourses, disturbed areas, cultivated and also naturalized sporadically. Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [naturalized in Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand; Pacific Islands, native in North and South America].

The whole plant is used in treating snakebite.

**22. *Ipomoea turbinata*** Lagasca, Gen. Pl. 10. 1816.

丁香茄 ding xiang qie

*Calonyction longiflorum* Hasskarl; *C. muricatum* (Linnaeus) G. Don; *C. speciosum* Choisy var. *muricatum* (Linnaeus) Choisy; *Convolvulus colubrinus* Blanco; *C. muricatus* Linnaeus; *Ipomoea bona-nox* Linnaeus var. *purpurascens* Ker Gawler; *I. muricata* (Linnaeus) Jacquin.

Herbs annual, twining; axial parts often tuberculate, glabrous or nearly so; sap milky. Stems 2–10 m. Petiole 4–12 cm; leaf blade cordate,  $7\text{--}18 \times 6.5\text{--}15$  cm, base cordate, margin entire, apex acute or caudate-acuminate. Inflorescences 1- to few flowered; peduncle 3–6 cm; bracts oblong, ca. 8 mm, scarious. Pedicel 1–2 cm, thicker apically, much thickened in fruit. Flowers nocturnal. Sepals oblong to ovate, ± equal, fleshy, glabrous, distinctly enlarged in fruit and eventually reflexed; outer 2 sepals 6–8 mm, apex attenuate into a thick, suberect awn ca. 4 mm; inner 3 sepals 7–8 mm, apex obtuse or emarginate, awn shorter. Corolla pale purple, salverform, 5–7.5 cm; tube 3–6 cm, flaring apically; limb funneliform to rotate, 3–5 cm in diam., shallowly 5-lobed. Stamens slightly exserted or not; filaments inserted in apical part of corolla tube, base sparsely short pubescent; anthers large, base cordate. Pistil slightly exserted or not; ovary glabrous. Stigma 2-lobed. Capsule ovoid, 1.8–2 cm, mucronate. Seeds black, trigonous, 9–10 mm, glabrous.  $2n =$

30.

Thickets, floodlands; 600–1200 m. Cultivated in Henan, Hubei, Hunan, escaped in S Yunnan [India, Indonesia, Japan, Kashmir, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Vietnam; Africa, North America, South America].

Gunn (Brittonia 24: 150–168. 1972) discussed the nomenclature of *Ipomoea turbinata*, which was treated in Fl. Reipubl. Popularis Sin. as *Calonyction muricatum*, presented evidence refuting the generic status for *Calonyction*, and recognized the latter as a section of *Ipomoea*.

Gunn reported that the young seeds, fruits, and thickened pedicels of *Ipomoea turbinata* are eaten as a vegetable in China and Sri Lanka, and the species is cultivated in India for its edible pedicels or as an ornamental for its nocturnal flowers. In China, the leaves are used in treating stomachaches and the seeds for treating trauma.

**23. *Ipomoea setosa* Ker Gawler, Bot. Reg. 4: t. 335. 1818.**

刺毛月光花 ci mao yue guang hua

*Batatas setosa* (Ker Gawler) Lindley; *Calonyction pavonii* (Choisy) H. Hallier; *C. setosum* (Ker Gawler) H. Hallier; *Convolvulus setosus* (Ker Gawler) Sprengel; *Ipomoea pavonii* Choisy; *I. setosa* Ker Gawler var. *pavonii* (Choisy) House.

Herbs annual, twining; axial parts with swollen-based purplish bristles. Stems to 5 m. Petiole 8–15 cm; leaf blade ± circular to broadly ovate in outline, 10–20 cm, 3–7-lobed; margin of lobes undulate-serrate, apex acuminate. Inflorescences 3–12-flowered; peduncle to 20 cm. Pedicel ± clavate, not distinct from calyx base. Flowers nocturnal. Sepals ovate to oblong, unequal, 1–1.4 cm, apex obtuse; outer 2 longer, glabrous or abaxially purplish bristly as stems. Corolla bright purplish to pink, ± salverform; tube 5–6 cm, 4–5 mm in diam. basally, 1–1.2 cm apically; limb 5.5–7 cm in diam., 5-lobed. Stamens included; anthers cordate basally. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule ± globose or depressed globose, 1.5–2 cm in diam. Seeds oblong, brown woolly.  $2n = 30$ .

Dense forests or thickets in valleys; 1000–1300 m. Cultivated and sparingly escaped in Guangdong, S Yunnan [North America (Jamaica, Mexico), South America].

**24. *Ipomoea mauritiana* Jacquin, Collectanea 4: 216. 1791.**

七爪龙 qi zhao long

Herbs perennial, twining, with glabrous or minutely muricate axial parts. Roots tuberous. Stems to 10 m, thinly angular. Petiole 3–11 cm; leaf blade circular in outline, 7–18 × 7–22 cm, usually palmately 5–7-divided to or beyond middle, rarely entire or shallowly lobed; segments lanceolate or elliptic, glabrous or sparsely pubescent along midvein, entire or irregularly undulate, apex acuminate or acute, mucronulate. Inflorescences few to many flowered; peduncle 2.5–20 cm; bracts early deciduous. Pedicel 0.9–2.2 cm. Sepals ± circular, oblong to broadly elliptic, concave, equal or outer 2 shorter, 7–12 mm, glabrous, apex obtuse. Corolla pink or reddish purple, with a darker center, funnelform, 5–6 cm; limb 5–7 cm in diam., undulate. Stamens included. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule ovoid, 1.2–1.4 cm. Seeds dark brown, ca. 6 mm, woolly-sericeous

with long, easily detached hairs.  $2n = 30$ .

Waste places, dwarf forests near seashores, thickets, montane forests, streamsides; 0–1100 m. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Cambodia, Indonesia, Japan (Ogasawara and Ryukyu Islands), Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Pacific Islands].

The origin of *Ipomoea mauritiana* is unknown, but it may be in tropical America, where the nearest relatives occur.

*Ipomoea mauritiana* has often been misidentified as *I. digitata* (Linnaeus) Linnaeus, a West Indian endemic that does not occur in Asia.

The leaves and roots are used externally to treat tuberculosis and for the treatment of external and breast infections.

**25. *Ipomoea sumatrana* (Miquel) van Ooststroom, Blumea 3: 571. 1940.**

海南薯 hai nan shu

*Letsomia sumatrana* Miquel, Fl. Ned. Ind., Suppl. 560. 1860; *Ipomoea rotundisepala* Hayata; *I. staphylina* Roemer & Schultes var. *malayana* Prain.

Climbers woody, with glabrous, sometimes verruculose axial parts. Stems twining or prostrate, to 20 m. Petiole 4.5–10 cm, scabrous; leaf blade broadly ovate, (3.5)–8–16 × (4)–7–13 cm, ± leathery, abaxially often pubescent, adaxially subglabrous, base shallowly cordate to truncate, margin entire, apex obtuse, acute, or short acuminate; lateral veins usually 11–14 pairs, prominent abaxially. Inflorescences paniculate, fundamentally cymose, 10–15 cm; peduncle 3–13 cm; basal bracts leafy; bracteoles early deciduous, ovate, 1–1.5 mm. Pedicel 7–10 mm. Sepals slightly unequal, glabrous; outer 2 broadly ovate, 3.5–5 mm, apex obtuse; inner 3 ± circular, 4.5–6 mm, apex broadly rounded or emarginate. Corolla lilac or greenish white, with a reddish purple tube inside, tubular-funnelform, 3–3.5 cm, glabrous. Stamens included, unequal; filaments inserted ca. 1.5 mm above base of corolla. Ovary conical, glabrous. Stigma 2-lobed. Capsule ovoid, 8–9 mm, apex ± acute. Seeds black-brown, ca. 4 mm, hilum with a tuft of long sericeous hairs.

Dense forests or thickets in valleys; 100–900 m. SE Guangxi, Hainan, Taiwan, S Yunnan [Indonesia, Laos, Malaysia, ?Myanmar, Thailand].

*Ipomoea sumatrana* was treated in Fl. Reipubl. Popularis Sin. as *I. staphylina* Roemer & Schultes. The latter is a very closely related Indian species. Ooststroom (l.c. 572) recognized both species and separated *I. sumatrana* by having thicker leaf blades with 11–14 pairs of lateral veins, tubular-funnelform corollas 3–3.5 cm, and filaments inserted ca. 1.5 mm above corolla base, and *I. staphylina* by having thinner leaf blades with 7–8(–11) pairs of lateral veins, broadly funnelform to campanulate corollas ca. 2 cm, and filaments inserted ca. 2.5 mm above corolla base. The Chinese material agree much more closely with *I. sumatrana*. It is possible that *I. staphylina* occurs in SW China, but no specimens have been seen in herbaria outside of China.

**26. *Ipomoea soluta* Kerr var. *alba* C. Y. Wu, Rep. Stud. Pl. Trop. Subtrop. Yunnan 1: 122. 1965.**

白大花千斤藤 bai da hua qian jin teng

Subshrubs, scandent. Stems gray, terete, verruculose-lenticellate. Petiole 6.5–9 cm, densely puberulent; leaf blade ovate-cordate, 16–17 × 13–15 cm, abaxially pubescent, adaxially subglabrous, base cordate, margin entire; lateral veins ca. 14 pairs. Inflorescences several flowered; peduncle stout, shorter than petiole, densely puberulent; bracts early deciduous. Pedicel stout, 0.7–1.3 cm, densely pubescent. Sepals slightly unequal, ± leathery, abaxially densely pubescent; outer 2 elliptic, 1.3–1.4 cm, apex obtuse; inner 3 elliptic to nearly circular, 1.4–1.5 cm, apex emarginate. Corolla white, broadly funnelform, 5.5–6.5 cm; tube gradually narrowed toward base; limb shallowly 5-lobed; lobes semicircular. Stamens slightly unequal; filaments dilated basally, puberulent. Ovary narrowly conical. Stigma 2-lobed. Capsule unknown. Fl. Feb.

- Thickets on dry mountain slopes. Yunnan.

*Ipomoea soluta* var. *soluta*, which is distributed in India, Laos, Myanmar, and Thailand, is distinguished from var. *alba* by having purple instead of white corollas.

27. ***Ipomoea carnea*** Jacquin subsp. ***fistulosa*** (Martius ex Choisy) D. F. Austin, Taxon 26: 237. 1977.

树牛干 shu qian niu

*Ipomoea fistulosa* Martius ex Choisy in A. de Candolle, Prodr. 9: 349. 1845; *Batatas crassicaulis* Benthham; *I. crassicaulis* (Benthham) B. L. Robinson.

Shrubs, 1–3 m; axial parts puberulent, later glabrescent; sap milky. Branches terete or angular, stout, becoming sparsely lenticellate with age. Petiole 2.5–15 cm; leaf blade ovate or ovate-oblong, 6–25 × 4–17 cm, densely puberulent or adaxially subglabrous, base cordate or truncate, margin entire, apex acuminate, mucronulate; midvein 2-glandular abaxially at base, lateral veins 7–9 pairs. Inflorescences few to several flowered; peduncle stout, 5–10 cm; bracts early deciduous, ovate. Pedicel 1–1.5 cm. Sepals ovate or nearly circular, broadly rounded, abaxially puberulent, equal or inner ones longer, 5–6 mm. Corolla lilac or pink, darker inside, funnelform, 7–9 cm; tube and midpetaline bands mealy outside. Stamens included; filaments unequal; anthers linear, base sagittate. Pistil included; ovary puberulent. Style base puberulent; stigma 2-lobed. Capsule pale brown, ovoid, 1.5–2 cm, 4-valved, apiculate. Seeds black, ca. 1 cm, brown sericeous-pubescent.  $2n = 30$ .

Guangxi, Hainan, Taiwan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Myanmar, Nepal, New Guinea, Pakistan, Sri Lanka, Thailand; North America, Pacific Islands, South America].

*Ipomoea carnea*, which is native of tropical America, is cultivated in many parts of Asia and has become widely naturalized. The ± erect, shrubby subsp. *fistulosa* is preferred in cultivation, whereas subsp. *carnea*, which is more viny, is seldom seen outside its native range in Central and South America.

28. ***Ipomoea violacea*** Linnaeus, Sp. Pl. 1: 161. 1753.

管花薯 guan hua shu

*Calonyction grandiflorum* (Jacquin) Choisy; *C. jacquinii*

G. Don; *C. tuba* (Schlechtendal) Colla; *Convolvulus grandiflorus* Jacquin; *Convolvulus tuba* Schlechtendal; *Ipomoea glaberrima* Bojer ex Bouton; *I. grandiflora* (Jacquin) H. Hallier; *I. longiflora* R. Brown; *I. macrantha* Roemer & Schultes; *I. tuba* (Schlechtendal) G. Don.

Plants perennial, woody, twining, glabrous. Stems to 5 m, often longitudinally wrinkled. Petiole 3.5–11 cm; leaf blade circular or ovate, 5–16 × 5–14 cm, base deeply cordate; lobes rounded or rarely angular, apex acuminate, mucronulate; lateral veins 7 or 8 pairs. Inflorescences 1- to few flowered; peduncle often 2.5–4.5(–7) cm. Pedicel 1.5–3 cm, thickened and clavate in fruit. Flowers nocturnal. Sepals ± circular, equal or outer 2 shorter, 1.5–2.5 cm, thinly leathery, apex obtuse or emarginate, mucronulate, enlarged in fruit and reflexed. Corolla white, with green midpetaline bands, salverform, 9–12 cm; limb 8–10 cm in diam. Stamens included; filaments inserted near base of corolla tube. Pistil included; ovary glabrous. Stigma 2-lobed. Capsule pale brown, ovoid to ± globose, 2–2.5 cm, glabrous. Seeds black, 1–1.2 cm, densely short tomentose, edges with ca. 3 mm long sericeous hairs.  $2n = 30$ .

Beaches, seaside thickets, edges of brackish rivers and lagoons; near sea level to 100 m. Guangdong, Hainan, Nanhai Zhudao, Taiwan [Indonesia, Japan, Malaysia, New Guinea, Philippines, Sri Lanka, Thailand; Africa, N Australia, North America, Pacific Islands, South America].

29. ***Ipomoea aculeata*** Blume var. ***mollissima*** (Zollinger) H. Hallier ex van Ooststroom, Blumea 3: 574. 1940.

夜花薯藤 ye hua shu teng

*Calonyction mollissimum* Zollinger, Syst. Verz. 2: 128, 131. 1854; *C. mollissimum* var. *glabrior* Miquel; *Ipomoea mollissima* (Zollinger) H. Hallier; *I. mollissima* var. *glabrior* (Miquel) Boerlage; *I. yomae* Kurz.

Plants perennial, woody, twining, occasionally prostrate, pubescent, glabrescent. Stems terete or angular, smooth or with small hooks. Petiole slender, 3–10 cm; leaf blade ovate to circular, 5–14 × 3–10 cm, pubescent or subglabrous, base cordate, margin entire, undulate, or acutely angled, apex long acuminate, mucronulate. Inflorescences 1- to few flowered; peduncle 4–15 mm. Pedicel 0.7–1.5 cm, sometimes angular, thicker distally, clavate in fruit, to 2 cm, recurved. Flowers nocturnal. Sepals slightly unequal, outer 2 longer, 1.2–1.8 cm, enlarged in fruit, broadly elliptic to circular, thinly leathery, apex rounded to emarginate, mucronulate. Corolla white, greenish outside, salverform, 12–17 cm; limb 8–10 cm in diam. Stamens minutely exserted; filaments inserted near mouth of tube, ca. 2 mm, base pubescent. Pistil slightly exserted; ovary glabrous. Stigma 2-lobed. Capsule at first enclosed by sepals that later reflex, ovoid, ca. 1.5 cm, apiculate, 4-valved. Seeds 6–8 mm, densely gray-brown woolly. Fl. Sep-Oct, fr. Sep-Oct.

Thickets, forests, roadsides; 0–1200 m. Hainan [Indonesia, Myanmar, Philippines, Thailand].

