CACTACEAE

仙人掌科 xian ren zhang ke

Li Zhenyu (李振宇)\(^1\); Nigel P. Taylor\(^2\)

Fleshy perennials, shrubs, trees or vines, terrestrial or epiphytic. Stems jointed, terete, globose, flattened, or fluted, mostly leafless and variously spiny. Leaves alternate, flat or subulate to terete, vestigial, or entirely absent; spines, glochids (easily detached, small, bristlike spines), and flowers always arising from cushionlike, axillary areoles (modified short shoots). Flowers solitary, sessile, rarely clustered and stalked (in Pereskia), bisexual, rarely unisexual, actinomorphic or occasionally zygomorphic. Receptacle tube (hypanthium or perianth tube) absent or short to elongate, naked or invested with leaflike bracts, scales, areoles, and hairs, bristles, or spines; perianth segments usually numerous, in a sepaloid to petaloid series. Stamens numerous, variously inserted in throat and tube; anthers 2-loculed, dehiscing longitudinally. Ovary (pericarpel) inferior, rarely superior, 1-loculed, with 3 to many parietal (rarely basal) placetas; ovules usually numerous; style 1; stigmas 2 to numerous, papillate, rarely 2-fid. Fruit juicy or dry, naked, scaly, hairy, bristly, or spiny, indehiscent or dehiscent, when juicy then pulp derived from often deliquescent funicles (except in Pereskia). Seeds usually numerous, often arillate or strophilal; embryo curved or rarely straight; endosperm present or absent; cotyledons reduced or vestigial, rarely leaflike.

About 110 genera and more than 1000 species: temperate and tropical America; *Rhapisalis baccifera* (J. S. Mueller) Stearn native in tropical Africa, Madagascar, Comoros, Mascarenes, and Sri Lanka; some species of other genera now extensively naturalized in the Old World through human agency; more than 60 genera and 600 species cultivated as ornamentals or hedges in China, of which four genera and seven species more or less naturalized.


1a. Plants terrestrial; stems not producing aerial roots; leaves present; flowers diurnal, rotate, without elongated tube; ovary (pericarpel) superior to inferior.

2a. Areoles without glochids; leaves broad and flat, pinnately nerved, ± persistent; flowers solitary or in inflorescences, mostly stalked; ovary (pericarpel) superior to inferior; seeds black, not arillate ........................................... 1. *Pereskia*

2b. Areoles with glochids; leaves usually small, terete to subulate, nerveless, caducous; flowers solitary, sessile; ovary (pericarpel) inferior; seeds encased in a white, bony aril ........................................... 2. *Opuntia*

1b. Plants epiphytic, climbing, or scrambling; stems often producing aerial roots; leaves absent; flowers nocturnal, funnelform or salverform, with elongated tube; ovary (pericarpel) inferior.

3a. Branches usually 3-winged or angled, rigid, with short spines or rarely spineless ........................................... 3. *Hylocereus*

3b. Branches usually flattened, leaflike, with a stout midrib, soft, spineless ........................................... 4. *Epiphyllum*

1. **PERESKIA** Miller, Gard. Dict. Abr., ed. 4. 1754.

**木麒麟属 mu qi lin shu**

Shrubs or climbers, or trees to 20 m tall. Branches terete, slightly fleshy when young; areoles with spines; glochids absent. Leaves somewhat fleshy, sessile or petiolate, broad, flat, pinnately veined, estipulate. Flowers solitary, or in fasciculate, sub-corymbose, racemose or paniculate inflorescences, stalked or sessile. Receptacle not produced into a tube beyond ovary, with numerous, ± leafy, often persistent scales. Perianth multiseriate; segments free, spreading or rotate, white to red, magenta or orange. Stamens numerous, inserted at base of perianth. Ovary (pericarpel) superior to inferior; placetas basal or parietal. Fruit globose, pear-shaped, or obovoid, fleshy, with or without scattered, leaflike scales. Seeds 2 to numerous; testa glossy black, brittle.

Seventeen species: tropical and subtropical America; five species cultivated as ornamentals in China, of which one species escaped from cultivation.

1. **Pereskia aculeata** Miller, Gard. Dict., ed. 8, *Pereskia* No. 1. 1768.

**木麒麟 mu qi lin**


Shrubs, at first erect, later clambering, 3–10 m tall. Areoles cushionlike and to 15 mm in diam. on trunk, 1.5–2 mm in diam. on twigs. Spines 1–3 per areole, on main branches acicular and straight, 1–4(–8) cm, on young branches additionally with 2 short, broadly based, recurved spines for climbing. Petiole 3–7 mm; leaf blade green or abaxially purplish, ovate, elliptic, or obovate, 4.5–7(–10) × 1.5–5 cm, glabrous, base cuneate to rounded, margin entire, apex shortly acuminate or acute; lateral veins 4–7. Flowers 3–4 cm in diam., fragrant (diosmin); pedicel 5–10 mm. Sepaloids pale green, ovate or obovate. Petaloids white to pale yellow, obovate to spatulate, 15–20 × 6–8 mm, margin entire, apex acute to truncate. Filaments white or

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1. Opuntia dillenii (Ker Gawler) Haworth, Suppl. Pl. Succ. 79. 1819.

仙人掌 xian ren zhang

*Cactus dillenii* Ker Gawler, Bot. Reg. 3: t. 255. 1818; *Opuntia stricta* (Haworth) Haworth var. dillenii (Ker Gawler) L. Benson.

Shrubs sprawling or erect, 1–3 m tall. Trunk absent or short. Larger, terminal joints green to gray-green, obovate or elliptic-ovobate to suborbicular, 10–35×40) × 7.5–20(–25) cm. Areoles 2–9 mm in diam. Spines 1–12(–20) per areole on most areoles, spreading, yellow, ± brown banded or mottled, subulate, straight or curved, stout, usually flattened at base; petaloids lemon-yellow; stigmas 5–7 mm long; stamens 5–7 mm, bright yellow to orange; filaments and anthers red ...................... 4. *O. cochenillifera*

2. Opuntia ficus-indica (Linnaeus) Miller, Gard. Dict., ed. 8, Opuntia No. 2. 1768.

梨果仙人掌 li guo xian ren zhang


Shrubs erect or small trees, 1.5–5 m tall. Trunk (when present) terete. Joints dull green or grayish green, broadly to narrowly obovate, elliptic, or oblong, 20×60–70 cm, thick. Areoles usually narrowly elliptic, 2–4.5 mm. Spines usually absent, sometimes 1–6 per areole, spreading or deflexed, bristle-like or acicular, 0.3–3.2 cm, basally flattened; glochids yellow, early deciduous. Leaves conic, 3–4 mm, early deciduous. Flowers 5–8 cm in diam. Sepaloid yellow with reddish green center, broadly ovate or obovate, to 2 cm, margin entire or denticulate, apex truncate or acute, mucronate. Petaloids spreading, yellow to orange, obovate to oblong-ovobate, 2.5–3.5 × 1.5–2 cm, margin entire or erose, apex rounded, truncate, mucronate, or emarginate. Filaments yellowish, ca. 6 mm; anthers yellow, 1.2–1.5 mm. Style greenish, ca. 15 mm; stigmas (6–)7–10, cream, 3–4 mm. Fruit yellow, orange, or purplish, 5–10 × 4–9 cm, umbilicous low and concave. Seeds gray or tan, elliptic-ovobate, 4.5–3.6–4.5 × 3.4 mm. Fl. May–Jun.

Hot dry valleys, rocks; 600–2900 m. W Guangxi, SW Guizhou, SW Sichuan, SE Xizang, Yunnan [of cultivated origin in Mexico ca. 9000 years ago; widely introduced as a hedge or for its edible young joints and fruit; naturalized in tropical and subtropical regions].

This species was first introduced to China in 1645.

单刺仙人掌  dan ci xian ren zhang

*Cactus monacanthos* Willdenow, Enum. Pl. Suppl. 33. 1814; *C. indicus* Roxburgh.

Shrubs or treelike, 1.3–4 m tall. Trunk (when present) terete. Larger, terminal joints glossy green, obovate, narrowly so, obovate-oblong, oblong, or oblong-elliptic, 10–30 × 7.5–12.5 cm, thin, narrowed basally, margin undulate toward apex. Areoles 3–5 mm in diam. Spines sparse on joint 1 or 2 (or 3) per areole, but on main trunk to 12 per areole, erect or spreading, grayish, dark brown tipped, acicular, 1–7.5 cm; glochids brownish, 2–3 mm. Leaves conic, 2–4 mm, deciduous. Flowers 5–7.5 cm in diam. Sepaloids with red midrib and yellow margin, obovate or broadly ovate, 0.8–2.5 × 0.8–1.5 cm, apex rounded or emarginate. Petaloids spreading, yellow to orange, or obovate to oblong-ovate, 2.3–4 × 1.2–3 cm, margin subentire, apex rounded, or mucrurate. Filaments greenish, ca. 12 mm; anthers pale yellow, ca. 1 mm. Style greenish, 1.2–2 cm; stigma 6–10, cream, 4.5–6 mm. Fruit reddish purple, obovate, 5–7.5 × 4–5 cm, umbilicus slightly depressed. Seeds light tan, irregularly elliptic, ca. 4 × 3 mm. Fl. Apr–Aug.

This species was first recorded in China in 1625.

When describing *Opuntia monacantha*, Haworth based the name on a plant from Barbados, where only *O. dilenii* is currently recorded as native. Haworth’s name has now been neotyped to maintain its use in the sense employed here and is the earliest name consistently applied to this widely introduced plant, which is native to SE South America.

Haworth cited *Cactus monacanthos* Willdenow 1814 in synonymy with a “?,” but this indication of doubt rules out Willdenow’s unpublishable name as a potential basionym for that of Haworth. An earlier name formerly and widely applied to *O. monacantha* is *O. vulgaris* Miller. This confused name has now been typified to become a synonym of *O. ficus-indica* (Linnaeus) Miller (see Leuenberger, *Taxon* 42: 419–429).


胭脂掌 yan zhi zhang


Shrubs or small trees, 2–4 m tall. Trunk (when present) terete. Large joints green, elliptic to narrowly obovate, 8–40(–50) × 5–7.5(–15) cm, thick, margin entire, base and apex rounded. Areoles ca. 2 mm in diam. Spines usually absent, when present: 1–3 per areole, spreading, grayish tan, acicular, 3–9 mm; glochids early deciduous. Leaves conic, 3–4 mm, early deciduous. Flowers 1.2–1.5 cm in diam., erect. Sepaloids with brilliant red or green midrib, largest ones ovate-deltoid, 5–12 × 6–9 mm, margin entire, apex acute. Petaloids bright red, ovate to obovate, 1.3–1.5 × 0.6–1 cm, margin entire or undulate, apex rounded or acute. Filaments pink, 3–4 cm; anthers pink, ca. 1.5 mm. Style pink, 4–4.5 cm; stigma 6–8, greenish, ca. 3 mm. Fruit red, ellipsoid, 3–5 × 2.5–3 cm, umbilicus developed but not conspicuous. Seeds gray or tannish, thickened discoid, ca. 3 mm in diam. Fl. Jul–Feb.

Slopes; low altitudes. S Guangdong, Guangxi, Hainan [native to Mexico; widely introduced and escaped in tropical regions].

This species was first introduced to China in 1901. Some authorities now recognize this species in the genus *Nopalea*, as distinct from *Opuntia*, based on pollen-morphological differences.

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量天尺属 liang tian chi shu


Plants climbing, scrambling, or epiphytic. Stems branched, usually 3-winged or -angled, margins often horny, often producing numerous aerial roots. Areoles spaced far apart in notches along wings or angles. Spines short or rarely absent. Leaves absent. Flowers 25–30 × 15–34 cm. Receptacle tube funnelform. Sepaloids with red midrib and yellow margin, obovate or broadly ovate, 0.8–2.5 × 0.8–1.5 cm, apex rounded or emarginate. Petaloids spreading, yellow to orange, or obovate to oblong-ovate, 2.3–4 × 1.2–3 cm, margin subentire, apex rounded, or mucrurate. Filaments cream, 5–7.5 cm; anthers linear, ca. 4.5 mm. Style cream, 14–20 cm, stout; stigmas 6–8, greenish, ca. 3 mm. Fruit red, ellipsoid, 3–5 × 2.5–3 cm, umbilicus developed but not conspicuous. Seeds gray or tannish, thickened discoid, ca. 3 mm in diam. Fl. Jul–Feb.

Slopes; sea level to 2000 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [native to Argentina, Brazil, Paraguay, and Uruguay; widely introduced and naturalized in tropical and subtropical regions].

This species was first recorded in China in 1625.

When describing *Opuntia monacantha*, Haworth based the name on a plant from Barbados, where only *O. dillenii* is currently recorded as native. Haworth’s name has now been neotyped to maintain its use in the sense employed here and is the earliest name consistently applied to this widely introduced plant, which is native to SE South America.

This confused name has now been typified to become a synonym of *Opuntia*, based on pollen-morphological differences.
CACTACEAE

Trees, rocks, maritime scrub; sea level to 300 m. S Fujian, S Guangdong, SW Guangxi, Hainan, Taiwan [perhaps native to Mexico and Central America; widely introduced and escaped in tropical Asia, E Australia, and South America].

This species was first introduced to China in 1645. It is usually cultivated as a hedge, or for its edible fruit. The flower is often eaten in a vegetable soup in S Guangdong.


*Phyllocactus* Link, nom. illeg. superfl.

Plants mostly epiphytic. Old stems woody at base, often terete; branches usually flattened and leaflike, or 3-winged, with stout midrib, margins crenate, coarsely serrate, or lacerate, sometimes horny. Areoles seated between crenations of stem margins, woolly when young, setose in juvenile growth. Leaves and spines absent. Flowers nocturnal, borne in lateral areoles, solitary, sessile, funnelform or salverform, usually large. Receptacle tube elongate, with scattered scales. Perianth spreading to rotate; segments usually linear-lanceolate. Petaloids white; outer ones often recurved, sometimes cream or pinkish. Stamens numerous; filaments inserted in receptacle tube and perianth throat; anthers exerted. Placentas parietal; style elongate; stigmas numerous, exerted, linear. Fruit green, red, or purplish, globose to cylindric, usually fleshy, with low ridges bearing scales, usually splitting along one side when ripe. Seeds numerous, ovate-reniform; testa glossy black, minutely wrinkled or spotted.

About 13 species: tropical America; four species cultivated in China as ornamentals, of which one species occasionally escaped from cultivation in tropical areas.


*昙花* tan hua

*Cereus oxypetalus* Candolle, Prodr. 3: 470. 1828; *Phyllocactus oxypetalus* (Candolle) Link ex Walpers.

Shrubs epiphytic, freely branched, 2–6 m tall, with aerial roots. Old stems and basal extension shoots terete, to 2 m or more, woody; branches numerous, dark green, laterally flattened, leaflike, lanceolate to oblanceolate, 15–100 × 5–12 cm, glabrous, base cuneate, attenuate, or stalked, margin undulate to deeply crenate, apex acute to acuminate; midrib 2–6 mm wide, stout. Areoles small, spineless. Flowers nocturnal, fragrant, funnelform, 25–30 × 10–27 cm. Receptacle tube 13–18 cm, base green, 4–9 mm in diam., slightly angled, with triangular to lanceolate scales 3–10 mm. Sepaloids often recurved, pale green or pinkish red, linear to oblanceolate. Petaloids white, oblanceolate to obovate, 7–10 × 3–4.5 cm. Filaments white, 2.5–5 mm; anthers cream, 3–3.5 mm. Style white, 20–22 cm; stigmas 15–20, cream, narrowly linear, 1.6–1.8 mm. Fruit rare, purplish red, oblong, ca. 16 × 5.7 cm. Seed 2–2.5 × ca. 1.5 mm. Fl. Jun–Oct.

Escaped from cultivation in tropical areas; 1000–1200 m. S Yunnan (Jinghong) [native to Mexico and Guatemala; widely introduced elsewhere as an ornamental].

This species was first introduced to China in 1645, and the naturalized plant was first recorded in Jinghong, Yunnan, in 1936. The mucilaginous flower is often eaten in a vegetable soup.