

59. MANIHOT Miller, Gard. Dict. Abr., ed. 4. 1754.

木薯属 mu shu shu

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*Janipha* Kunth; *Mandioca* Link; *Manihotoides* D. J. Rogers & Appan.

Trees, shrubs, or herbs, monoecious (rarely dioecious), sometimes with fleshy root-tubers; stems and branches with prominently large leaf scars; latex white; indumentum absent. Leaves alternate; stipules small, usually caducous; petioles long, apex glandular or stipellate; leaf blade usually palmately lobed or dissected, sometimes uppermost subentire. Inflorescences terminal or pseudoaxillary, mostly racemose-paniculate, usually bisexual, with long peduncles; flowers apetalous. Male flowers: calyx synsepalous; sepals 5, imbricate, petaloid; disk intrastaminal, usually 10-lobed; stamens 8–15, in 2 series; filaments free, delicate; anthers 2-locular, longitudinally dehiscent, connectives hairy at apex; pistillode small or absent. Female flowers: sepals 5, free or connate, sometimes deciduous; disk annular, sometimes with staminodes; ovary 3(or 5)-locular; ovules 1 per locule; styles short, free, mostly multifid or lacerate (rarely bifid); stigmas broad. Fruit a capsule, 3-valved; columella often persistent. Seeds carunculate; testa dry, crustaceous; endosperm fleshy; cotyledon broad and flat.

About 60 species: tropics of the Americas, mostly from Brazil, also widely cultivated in tropical regions; two species (introduced) in China.

- 1a. Leaf blade peltate with petiole inserted at least 5 mm from margin, lobes obovate to elliptic; male calyx glabrous inside; fruits without wings ..... 1. *M. glaziovii*  
1b. Leaf blade peltate with petiole inserted less than 5 mm from margin, lobes oblanceolate to narrowly elliptic; male calyx hairy inside; fruits with 6 longitudinal wings ..... 2. *M. esculenta*

1. **Manihot glaziovii** Müller Argoviensis in Martius, Fl. Bras. 11(2): 446. 1874.

木薯胶 mu shu jiao

*Manihot carthaginensis* (Jacquin) Müller Argoviensis subsp. *glaziovii* (Müller Argoviensis) Allem.

Trees or shrubs, up to 14 m tall; bark strongly peeling glossy brown, latex abundant; branches herbaceous, glabrous. Stipules lanceolate, 4–6 mm, gray-green, lacinate; petiole 4–25 cm, with many longitudinal grooves, peltate, inserted at least 5 mm from margin; leaf blade palmately 3–7-lobed, 10–30 ×

15–25 cm, papery or membranous, lobes obovate, elliptic, rhomboid, or spatulate, 7–10 × 3.5–7 cm, margins entire, apex acute to shortly acuminate. Panicles 7–9 cm; bracts lanceolate, ca. 2.5 mm. Male flowers: calyx 9–11 mm, 5-lobed, lobes oblong, ca. 5 × 2–3 mm, apex obtuse, glabrous inside; disk shallowly cupular, 10-lobed, glabrous; anthers oblong, ca. 2.5 mm. Female flowers: calyx 10–11 mm, 5-lobed; ovary ellipsoidal, glabrous. Capsules subglobose or globose, ca. 2 cm in diam., warty, wingless, rugose. Seeds depressed-ovoid, ca. 1.5 cm, with shallow brown spot-stripes. Fl. Sep–Oct, fr. Nov–Dec.

Cultivated. S Guangdong, Guangxi, Hainan [native to Brazil; widely cultivated in tropical Africa, Asia, and elsewhere].

*Manihot glaziovii*, the Ceará rubber tree, is grown as a source of rubber. It has become naturalized in some parts of the world and is considered to be a potentially invasive weed.

2. **Manihot esculenta** Crantz, Inst. Rei Herb. 1: 167. 1766.

木薯 mu shu

*Jatropha manihot* Linnaeus, Sp. Pl. 2: 1007. 1753; *Janipha aipi* (Pohl) J. Presl; *J. manihot* (Linnaeus) Kunth; *Jatropha stipulata* Vellozo; *Mandioca aipi* (Pohl) Link; *M. dulcis* Parodi; *M. utilissima* (Pohl) Link; *Manihot aipi* Pohl; *M. edulis* A. Richard; *M. utilissima* Pohl.

Erect shrubs 1.5–5 m tall; root tubers terete. Stipules triangular-lanceolate, 5–7 mm, entire or with 1 or 2 bristly segments; petiole 6–35 cm, slightly peltate, inserted less than 5 mm from margin; leaf blade palmately 3–9-lobed, 5–20 cm, lobes oblanceolate to narrowly elliptic, 8–18 × 1.5–4 cm, apex acu-

Fl. China 11: 275–276. 2008.

minate, entire; lateral veins 5–15. Racemes terminal or axillary, 5–8 cm; bracts oblong-lanceolate; pedicels 4–6 mm. Male flowers: calyx ca. 7 mm, purple-red, divided to or over middle, lobes long ovate, 3–4 × ca. 2.5 mm, hairy inside; stamens 6–7 mm; anthers white pubescent at apex. Female flowers: calyx ca. 10 mm, lobes oblong-lanceolate, ca. 8 × 3 mm; ovary ovoid, longitudinally 6-angled; stigmas recurved, plaited. Capsule ellipsoidal, 1.5–1.8 × 1–1.5 cm, longitudinally 6-winged, scabrous. Seeds slightly triangular, ca. 1 cm; testa crustaceous, smooth, with spot-stripes. Fl. Sep–Nov.

Widely cultivated. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [native to Brazil; cultivated throughout the tropics].

The root tubers yield tapioca and are a staple crop in many areas of the tropics. They contain hydrocyanic acid and may cause death if eaten raw; they become edible after thorough soaking in water and cooking.

Fl. China 11: 275–276. 2008.