

HYDROCARYACEAE (C. G. G. J. van Steenis, Buitenzorg)

. 1. TRAPA

LINNÉ, Sp.Pl. 1 (1753) 120; MIQ. Fl. Ind. Bat. I, 1 (1855) 635; ANON. Tijdschr. Nijv. & Landb. 30 (1877) 97–100; BOERL. Handl. 1, 2 (1890) 561; VORDERMAN, Teysm. 6 (1895) 313–321; ANON. TROPENPFL. (1905) 703; WIGMAN, Teysm. 22 (1911) 547; WEBSTER, Philip. Agr. Rev. 6 (1913) 138, t. 12; FLEROFF, Bull. Jard. Bot. Rep. Russ. 24 (1925) 13; GAMS, Pfl. Areale I, 3 (1927) 39; OCHSE, Ind. Vrucht. (1927) 98; HEYNE, Nutt. Pl. (1927) 1206; BURK. Dict. Ec. Prod. Mal. Pen. 2 (1935) 2173; BACKER, Bekn. Fl. Java 4 a (1942) no 75, p. 11.

Floating aquatic herbs with dimorphic *leaves*, submerged ones opposite pinnatifid rootlike, apical ones in a rosette, rhomboid, dentate, with spongy often inflated petiole, arranged in leaf-mosaic; stipules 4–8, minute. *Flowers* bisexual, small, solitary, axillary, short-pedicelled, 4-merous, white or lilac. Petals imbricate. Disk present. Ovary half-inferior with 1 style and 2–4 persistent sepals turning often to thorns or horns. *Fruit* mostly 1-celled, 1-seeded, shell bone-hard; thorns after withering often set with barbs at the apex. Seed often producing 2–5 free germ-stalks.

Distr. Several species in the Old World, but not known from Australia.

Ecol. *Trapa* is very rare and was for the first time reported in 1877 in Java. It is surely a component of the old lowland eutrophous swamp flora such as is preserved in the Danoe swamp (Bantam).

Use. The fat-containing kernels of *T. bicornis* are highly nutritious and are eaten in West Java but not on a scale comparable to that of several parts of Asia, where it is a staple food.

Notes. Sometimes included in the *Onagraceae* or *Halorrhagaceae*. The names are those given by H. GLÜCK in sched. *Herb. Bog*. There is little agreement about the specific distinctions in the genus *Trapa*.

KEY TO THE SPECIES

1. Fruit triangular to 4 cm high, 7–8 cm broad with 2 large horns. Leaves green . . . 1. *T. bicornis*
1. Fruit tetrahedral, 1–1½ cm high, thorns 4, dagger-like, often unequal. Leaves spotted black at the base 2. *T. maximowiczii*

1. *Trapa bicornis* OSBECK var. *cochinchinensis* (LOUR.) GLÜCK.—OSBECK, Dagb. Ostind. Resa (1757) 191; LINNÉ f. Suppl. (1781) 128; VORDERMAN l.c. 313; MERR. Comm. Lour. (1935) 290; HEYNE, Nutt. Pl. (1927) 1206; OCHSE, l.c. f. 47.—*T. cochinchinensis* LOUR. Fl. Coch. (1790) 108; BACKER, Ann. J.B.B. Suppl. 3 (1910) 418.—*T. chinensis* LOUR. l.c.—Fig. 1f.

Leaves green, petiole 9–20 cm long, blade 5–7 by 6–9 cm. *Flowers* white. Horns of the fruit very blunt, straight or subcurved, their lateral surfaces bluntly irregularly ribbed.

Distr. Native of Asia, in *Malaysia*: introduced probably by the Chinese, cultivated mostly near Batavia by the Chinese. In Batavia markets fruits are offered for sale of a variety with black sharp-pointed curved points suggesting buffalo horns often referred to as *T. bispinosa* ROXB.; these fruits are imported apparently directly from China (Teysm. 4, p. 499; WEBSTER l.c. fig.).

Vern. *Lengkat*, *lengkong*, *ling*, *lingkok*, *chin*, *kerendan* (Batavia), *calthrop(s)*, *Chinese water chestnut* (Engl.), *waterroot* (Dutch).

Notes. Already in 1879–80, the Colon. Museum, Haarlem, received fruits of *T. bicornis* from Atjeh sent by Mr J. SCHAAR (cf. Tijd. Ned. Mij t. Bev. Nijv. for 1880).

2. *Trapa maximowiczii* KORSHINSKY, Act. Hort. Petrop. 12 (1892) 336; DE VOOGD, Trop. Natuur, 21

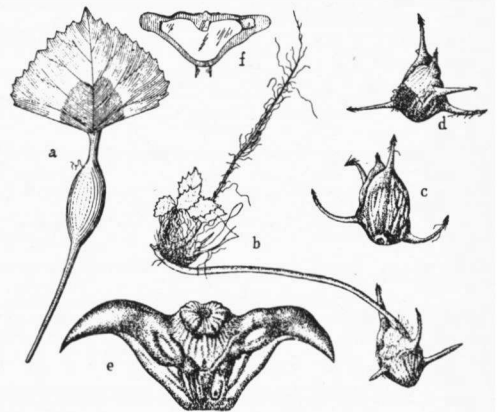


Fig. 1. *Trapa maximowiczii* KORSH. a. leaf, b. germinating fruit, c, d. fruits.—e. *Trapa bispinosa* ROXB. (edible, imported fruits on the market at Batavia).—f. *Trapa bicornis* OSB. var. *cochinchinensis* (LOUR.) GLÜCK (edible, cultivated locally), in section, $\times \frac{1}{2}$.

(1932) 62, 63, f. 9.—*T. quadrispinosa* auct. non ROXB.; VORDERMAN *l.c.*; Trop. Natuur 9 (1920) 73, f.; HEYNE *l.c.* 1207; OCHSE *l.c.* fig. 48.—Fig. 1.

Leaf blade towards the base black-brown or with 2 dark spots, 2½–4 by 3½–5½ cm, petiole 5–15 cm. Corolla pale lilac, anthers yellow. Fruit tipped by the conical hardened style. Thorns straight or curved often unequal, their apex barbed, surface of the fruit smooth, not ribbed.

Distr. SE. Asia, rare but certainly native in Malaysia: W.-NW. Java (from Indramaju to Bantam, e.g. Danu swamp (ANON. (1877), *l.c.*; VORDERMAN, *l.c.*) and S. Sumatra (Palembang Res., Lake Teloko, near Kaju Agung).

Ecol. Swamps and ponds, disappearing under anthropogenic influence.

Vern. *Salekat, salaikat, M.*

Notes. Possibly one of the forms of *T. natans* L. s. ampl.