CALLITRICHACEAE (C. A. Backer, Heemstede)

1. CALLITRICHACEAE


Delicate, annual or perennial herbs, aquatic and then either entirely submersed, or floating in the upper part, or, in humid localities, not rarely terrestrial and creeping, with slender stems. Leaves opposite, at the summits of floating stems often spuriously rosulate, exstipulate, small, linear, elliptic, oblowl or spatulate, entire, herbaceous, in the Mal. sp. triplenerved. Flowers minute, unisexual, axillary, solitary or rarely one ♀ and one ♂ flower from the same axil, often with 2 caducous, transversal, opposite, tender concave bracts. Calyx and corolla absent. ♂: Stamen 1; filament thin, anther 2-celled, cells bursting lengthwise, the slits becoming confluent at the top. ♀: Ovary sessile or sub sessile, 4-lobed, 4-celled. Ovule solitary in each cell, pendulous from the top of the cavity. Styles 2, free, often long, papillose. Fruit 4-lobed, with longitudinally margined or winged lobes. Testa membranous; endosperm fleshy; embryo terete, straight.

Distr. Only genus in the family, worldwide distributed, not yet known from S. Africa and in various regions scarce, in Malaysia apparently very rare, the only record proving its being indigenous is from the New Guinean highlands. Because of their small size terrestrial forms are easily overlooked.

Ecol. Stagnant or slowly moving fresh water, or, in humid localities, terrestrial, often gregarious.

Notes. The number of recognized species greatly depends on personal conception of specific delimitation, and so varies from few to ± 25. The difficulties are partly due to the inconstancy of the vegetative characters under various ecological conditions. Submerged leaves of several species are narrowly linear with a notched apex as figured in Hegel, Fl. Mitt.-Eur. 5, 1 (1925) f. 1804, as, c. See below under C. verna.

Nomencel. The nomenclature of the species is, if formal typification is applied, very much confused, according to hylander (Uppsala Univ. Årsskr. 1945, no 7, p. 235–236). As samuelsson has shown (Veröff. Geobot. Inst. Rübel 3, 1925, 603–628, fig. 1), the earliest Linnean species C. palustris embraces 5 species. Linné himself split it into two others, one of which is, of course superfluous, and both of which also comprise more than one species. Following samuelsson, the best, at least the most practical, solution is to reject these earlier Linnean names as nomina ambigua, and accept the species as defined or emended by LÖNNROTH in his Uppsala thesis of 1854, as has been done by most subsequent authors.

Syst. There is no unanimity about the systematic position of the genus which is placed in the Geraniáles by engler, and in the Lythrales by hutchinson. C. a. JÖRGENSEN (Jahrb. Wiss. Bot. 64, 1925, 440–442) is of opinion that it represents a reduced sympetalous type.


SAMUELSSON i.c., points attention to the extremely high vegetative polymorphism of this species, due to habitat. There seems to be no necessity to name all these forms.

The Malaysian materials belong to 3 forms, a terrestrial, an aquatic partly emersed, and an aquatic entirely submersed form. The first and the third form differ much in aspect.

Terrestrial form.—Fig. 1.

Minute delicate creeping herb rooting at the base, stem thin, branched, 1–2½ cm long, rather densely leafy. Roots solitary from the lower nodes, thin, rather long. Leaves opposite, not pseudo rosulate, elliptic-oblong-spataulate from a mostly cuneate or contracted, less often obtuse base, rounded at the apex, 1½–2½ cm by 3/4–1½ mm; petioles either passing gradually into the blade (spatulate leaves) or distinctly set off (elliptic leaves), at best 1½ mm long. Flowers in very many leaf-axils, sometimes in one axil only of a pair, mostly however in both axes and then either both of them ♀, or one ♀, the other male (pseudo-male?), subsessile; bracts not found. ♂: Filament erect, thin, at best ½ mm long; anther minute, yellow; cells bursting, but apparently effete; connective slightly produced between the cells. ♀: Fruit much compressed, broadly obovate or subcapitate, distinctly notched, ± 1 mm by 3/4 mm; fruit-lobes rounded at the apex, very narrowly double-winged on the back; wings broadest at the apex (± ½ mm), very thin, pairwise approximate and parallel; the pairs opposite. Styles spreading, very short, at best 1/2 mm, finally deciduous; pericarp translucent. Seeds obliquely ovoid-oblong, rather thick, brown,
finely reticulate-ribbed, fully 3/4 mm long, 1/3 mm broad.

Distr. C. verna, taken in a strict sense, occurs in N. and S. America, throughout Europe, N. Africa, temperate regions of Asia, Queensland, in Malaysia: Java.

Aquatic, partly emersed form.

Much larger than the above described terrestrial form, 10 cm or more long, very much branched, forming dense masses. Leaves spatulate, ± 10 by ± 3 mm (including the long petiole), rounded at the apex, with many sessile, patent, circular shallowly lobed hairs, resembling dots. Stamen of ± 4-5 mm; ovary of 9 as in the above described terrestrial form, but styles much longer (up to 4-5 mm); fruit as in the terrestrial form. Distr. In Malaysia: NE. New Guinea (Morobe District), 2700 m (M. S. CLEMENS 5733, 41125).

Entirely submersed aquatic form (C. papuana MERR. & PERRY, l.c.).

Leaves very narrowly linear with a subcircular apical incision, 1-nerved, up to 15 mm by 1/3-1/2 mm. 9 Flowers unknown. 9 Flowers very shortly pedicelled. Styles divergent, 1 1/2-2 mm long. Almost ripe fruit ± 1 1/2 mm long, ellipsoid-obovoid, slightly longer than broad, slightly notched at the apex, compressed but rather thick; wings along the narrower sides of the fruit, pairwise approximate, parallel, very narrow; seeds oblong. Distr. In Malaysia: Central New Guinea (BRASS 9541).

Ecol. Rooting in shallows of Lake Habema, 3225 m.

Note. Notwithstanding the different aspect of the plant the fruits of this submersed form agree fully with those of C. verna barring the slightly larger dimensions of the former.

Excluded

Callitriche sp. mentioned by Kurz (Nat. Tijd. N.I. 27, 1864, 167) from clear streams in the Menumbing Hills, Banka Island, seems very doubtful, firstly because Kurz's material was sterile and has not been traced in the herbarium, and secondly because all specimens of Callitriche hitherto found in the Malaysian tropics occur at much higher altitudes.