

PONTEDERIAACEAE (C. A. Backer, Heemstede)

Halophobous, aquatic or palustrial perennial herbs, rooting in the mud or free-floating. Stem erect or floating, solid, with numerous air-chambers as are the petioles. *Leaves* rosulate or alternate, or solitary at the top of the stem, emersed, floating or submerged, broad or narrow, curvined (when emersed); petioles sheathing at the base. *Flowers* ♀, ephemeral, mostly in racemiform, spiciform, subumbelliform or paniculiform inflorescences which are subtended by 1–2 spathe-like or tubular leaf-sheaths, rarely solitary or pairwise in the leaf-axils. Bracts minute or absent. Flowers often simultaneously or centrifugally expanding. *Perianth* choriphyllous or gamophyllous, 6-merous, actinomorphic or zygomorphic, blue or lilac, rarely yellow, after anthesis marcescent and tightly including the ovary or the fruit. Stamens 6 or 3, rarely 1, on the base, in the tube or in the throat of the perianth, often unequal; filaments free; anthers 2-celled, cells bursting lengthwise, rarely opening by pores. Ovary superior, sessile, 3-celled, with axile placentas or 1-celled with 3 parietal or with 1 apical placenta. Ovules numerous or 1 and then pendulous from the apex of the cell. Style 1; stigma entire or minutely 3-lobed. *Fruit* a 3-valved capsule or indehiscent. Seed(s) longitudinally ribbed. Embryo central, terete, straight, hardly shorter than the copious, mealy endosperm.

Distr. About 8 small genera and ± 25 species, 6 genera confined to the New World, one in Madagascar, one widely distributed in the Old World; in *Malaysia* one native genus, one introduced and abundantly naturalized, and one occasionally cultivated as an ornamental.

Ecol. Inhabitants of fresh water.

Uses. Frequently used as potherbs.

Anat. O. SCHWARTZ in Beih. Bot. Centr. Bl. 42, 1. Abt. (1926) 263–320, 13 fig.

Note. As in many other waterplants the vegetative characters show a rather wide range of variability.

KEY TO THE GENERA

1. Flowers distinctly pedicelled. Perianth actinomorphic, almost choriphyllous. Posterior tepal not with a discoloured blotch. Stamens 6; one mostly longer than the others. Filaments glabrous.
 1. *Monochoria*
1. Flowers sessile. Perianth strongly zygomorphic, very distinctly gamophyllous, posterior segment with a discoloured blotch. Stamens 3 or 6, and then 3 much larger than the others. Filaments, at least those of the longer stamens, hairy.
 2. Tepals 1½ cm long or longer. Stamens 6; anthers dorsifixed. Inflorescences often with more than 10 flowers. Cultivated and often wild 2. *Eichhornia*
 2. Tepals shorter than 1 cm. Stamens 3; anthers basifixed. Inflorescences 2–7-flowered. Exclusively cultivated; not further treated here 3. *Heteranthera (reniformis R. & P.)*

1. MONOCHORIA

PRESL, Rel. Haenk. 1 (1830) 127.—*Gomphima* RAFIN. Fl. Tell. 2 (1836) 10.

Glabrous, palustrial herbs, perennial or under unfavourable circumstances pseudo-annual, with long petioled radical *leaves*, and erect or obliquely erect stems arising from a suberect or creeping root-stock; each stem bearing at its top a single acute, densely curvined leaf, the petiole of which forms a prolongation of the stem. *Flowers* in terminal solitary, subsessile or shortly stalked, centrifugal, short or shortish, racemiform or subumbelliform inflorescences, which at first are hidden within the broad sheath of the cauline leaf, then burst forth, next bend forwards and after anthesis finally become quite deflexed. Inflorescence at the base, opposite the sheath of the floral leaf, with a large bract. Tepals 6, lilac blue with a green median nerve, free almost to the very base, spreading during anthesis, afterwards spirally contorted; 3 inner broader; median nerve of tepals thickened after anthesis.

Stamens 6 on the base of the perianth, subequal, or unequal: 5 with smaller yellow anthers, the sixth with a longer filament mostly provided with a lateral, obliquely erect tooth, its anther mostly larger, blue. All anthers basifixed, opening by a porelike slit. Ovary 3-celled, cells ∞ -ovuled. Style filiform, stigma subentire or minutely 3-lobed. Ripe *capsule* exploding loculicidally into 3 valves which are torn from the pedicel and are flung away together with the many longitudinally ribbed seeds.

Distr. Three *spp.* in the Old World, from NE. Africa to Manchuria southward to S. Australia (*vide infra*), two of which in *Malaysia*.

Ecol. The Malaysian species are decidedly halophobous. They inhabit freshwater pools, ditches, canal-banks, and flooded paddy-fields.

Uses. All parts, barring the roots, frequently eaten as a vegetable.

Notes. Neither the *spp.* nor the sections distinguished by O. SCHWARTZ (*cf.* E. & P. ed. 2, 15a, 1930, 186) agree with my views. In both *M. hastata* and *M. vaginalis* the inflorescence is a pseudo-raceme, which is, specially in *M. hastata*, distinctly abbreviated, but occasionally provided with a manifest main axis. On the other hand *M. cyanea* distinctly differs from the two other *spp.* (except *M. hastata* var. *elata*) by distinctly spaced flowers, by equal anthers, and inappending filaments. Therefore, I propose to divide the genus into two sections, *sect. Eumonochoxia* O. SCHWARTZ (incl. *sect. Deutomonochoria* O. SCHWARTZ) and *sect. Limnostachys* (F.V.M., *pro gen.*) BACKER, *stat. nov.*

KEY TO THE SPECIES

1. Anthers equal. Filaments not provided with an obliquely erect tooth or appendage. **3. *M. cyanea***
1. Anthers unequal, one much larger than the others, its filament provided with a tooth or appendage.
 2. Tillering, with a suberect or oblique, usually very short, rarely longish rootstock; old plants often forming dense tufts, but these tufts free from each other. Leaves of *adult* plants varying from broadly ovate to ovate-oblong from an obtuse, rounded, truncate or cordate but never sagittate or hastate base, up to 12½ cm long, often much smaller; basal lobes, if present, broadly rounded. Racemes 3–25-flowered. Flowers dark blue, mostly simultaneously expanded or nearly so. Pedicels 4–25 mm, rarely up to 40 mm. Perianth 11–15 mm long. Plant 5–50 cm high **1. *M. vaginalis***
 2. Rootstock of older plants well-developed, creeping, branched, so that these plants at last form large groups, the components of which are, or have been, subterraneously connected. Leaves of *adult* plants triangular-ovate, nearly always with a sagittate or hastate, very rarely with a cordate base, 7–25 cm by 4–20 cm; basal lobes divergent, mostly with an acuminate or narrowed apex. Racemes 15–60-flowered. Flowers pale blue, succedaneous in groups, so that the flowering is extended over a few days. Pedicels of the lower flowers 15–30 mm, of the higher 7–20 mm. Perianth 15–18 mm long. Plant 30–100 cm high, generally much more robust than the preceding species **2. *M. hastata***

1. *Monochoria vaginalis* (BURM. f.) PRESL, Rel. Haenk. 1 (1827) 128; HASSK. Pl. Jav. rar. (1848) 106; MIQ. Fl. Ind. Bat. 3 (1859) 548; Sum. (1860) 269; Ann. Mus. L.B. 3 (1867) 143, *incl. var. minor* MIQ.; SOLMS in A.D.C. Mon. Phan. 4 (1883) 524, *incl. var. plantaginea* (ROXB.) SOLMS; RIDL. in FORB. Nat. Wand. (1885) 520; O.K. Rev. Gen. 2 (1891) 718; HOOK. f. Fl. Br. Ind. 6 (1892) 363; KOORD. Minah. (1898) 307; HUB. WINKL. Bot. Jahrb. 44 (1910) 526; KOORD. Exk. Fl. 1 (1911) 283; MERR. Fl. Man. (1912) 141; WISSE, Trop. Natuur 1 (1912) 171, f. 1; MERR. Interpr. Herb. Amb. (1917) 135; MERR. En. Born. (1921) 111; En. Philip. 1 (1922) 200–201, *incl. var. pauciflora* (BL.) MERR.; BACK. Handb. Fl. Jav. 3 (1924) 40; RIDL. Fl. Mal. Pen. 4 (1924) 346; HOCHR. Cand. 2 (1925) 324, *incl. var. genuina*; HEYNE, Nutt. Pl. (1927) 435; BACK. Onkr. Suiker. (1928) 187, Atl. t. 199; OCHSE & BAKH. v. D. Br. Veg. (1931) t. 374, 375; CHERFILS, Fl. gén. I.C. 6 (1934) 818; BURK. C. Prod. 2 (1935) 1489; BACK. Bekn. Fl. Java, em. ed. 10 (1949) fam. 223, p. 2; STEEN. Fl. Sch. Indon. (1949) 135.—*Olus palustre* RUMPH. Herb. Amb. 6 (1750) 178, t. 75, f. 1.—*Pontederia vaginalis* BURM. f. Fl. Ind. (1768) 80; LINNÉ, Mant. 2 (1771) 228; BL. En. Pl. Java (1827) 32; DECNE, Nouv. Ann. Mus. 3 (1834) 362; SPAN. Linnaea 15 (1841) 477; MOR. Syst. Verz. (1845/46)

93; ZOLL. Syst. Verz. (1854) 66.—*Pontederia pauciflora* BL. En. Pl. Java 1 (1827) 32; MOR. Syst. Verz. (1845/46) 93; ZOLL. Syst. Verz. (1854) 66, *incl. var. minor*.—*Pontederia plantaginea* ROXB. Fl. Ind. ed. 2, 2 (1832) 123.—*Gomphima vaginalis* RAFIN. Fl. Tell. 2 (1836) 10.—*Pontederia linearis* HASSK. Flora 25, 2 (1842) Beibl. 1, p. 4; Cat. Bog. (1844) 28.—*Monochoria pauciflora* KUNTH, En. 4 (1843) 135; HASSK. Pl. Jav. Rar. (1848) 111; MIQ. Fl. Ind. Bat. 3 (1859) 549.—*Monochoria plantaginea* KUNTH, En. 4 (1843) 135; RIDL. J. Bot. 63 (1925) Suppl. p. 124.—*Monochoria ovata* KUNTH, l.c. 665; NAVES, Nov. App. (1880) 268.—*Monochoria junghuhniana* HASSK. Flora 35 (1852) 115; also Nat. Tijd. Ned. Ind. 8 (1855) 549.—*Monochoria linearis* MIQ. Fl. Ind. Bat. 3 (1859) 549.

Stems erect or obliquely erect. Leaves extremely variable as to shape and size, when adult mostly 2–12½ cm by ½–10 cm, in very young specimens entirely submerged without a distinct blade; leaf-top acuminate, very acute. Petioles broadly sheathing at the base, very variable as to length. Inflorescences soon deflexed, rather short, sometimes subumbelliform. Flowers of few-flowered inflorescences often unfolding simultaneously and all withering in the afternoon of the same day, of the many-flowered racemes opening centrifugally in



Fig. 1. *Monochoria hastata* (L.) SOLMS. Courtesy Pasuruan Exp. Station.

groups, so that the florescence extends over a few days. Perianth lilac blue. *Capsule* ellipsoid, ± 1 cm long. Seeds oblong, $\pm \frac{5}{6}$ mm long, brown with ± 10 longitudinal, very thin ribs, between the ribs densely and very finely transversely striate.

Distr. SE. Asia to China, Japan and throughout *Malaysia*.

Ecol. From the plains up to ± 1550 m, as well in periodically very dry as in constantly humid regions, in swampy or inundated localities, along ditches, in shallow pools and especially in flooded paddy-fields, where the plant is often one of the commonest weeds, and, after the drying-out of the field, completely dies off, developing anew from seeds in the following inundation-period. In constantly swampy localities it can reach a higher age and attain rather large dimensions, though it never becomes so robust as well-developed specimens of the following species.

Uses. The entire plant, barring the roots, furnishes an excellent vegetable. The juice of the leaves and the roots is used for medicinal purposes.

Vern. Very many local names, the principal ones of which are: *Bengok*, *wewèhan*, *J*, *biah biah*, *S*, *bira biraan*, *Md*, *ètjèng* (with various additions) *M*, *S*. Philippines: *Bigbigdán*, *gabing-uák*, *kalabúa* (Tag.), *gabi-gabi* (Bis.), *hahalung*, *hakhaklung* (If.), *bil-lagut*, *lalapápa* (Ik.), *saksaklung* (Ig.), *saksakong* (Bon.), *lagtáng*, *upi-úpi* (Bik.). Mal. Pen.: *Kélayar*.

Note. Specimens with few-flowered inflorescences and small, often narrow, proportionally long leaves have wrongly been described as varieties or even separate species with one of the epithets *linearis*, *pauciflora* or *plantaginea*. They are either young or feeble, or were collected in deepish water.

See further the note under the following species.

The East Asiatic *M. korsakowii* REGEL and the NE. African *M. africana* (SOLMS) N.E.Br. are in my opinion racial varieties of *M. vaginalis* (BURM. f.) Pr.

2. *Monochoria hastata* (L.) SOLMS in A.D.C. Mon. Phan. 4 (1883) 523; O.K. Rev. Gen. 2 (1891) 718; KOORD. Exk. Fl. 1 (1911) 283; MERR. Fl. Man. (1912) 141; MERR. Sp. Blanc. (1918) 95; En. Born. (1921) 111; BACK. Handb. Fl. Java 3 (1924) 41; Onkr. Suiker. (1928) 186, Atl. t. 198; OCHSE & BAKH. v. d. Br. Veg. (1931) 612, f. 373; BURK. Ec. Prod. 2 (1935) 1489; BACK. Bekn. Fl. Java, em. ed. 10 (1949) fam. 223, p. 2.—*Pontederia hastata* LINNÉ, Sp. Pl. (1753) 288; BURM. f. Fl. Ind. (1768) 80; BLUME, En. Pl. Java 1 (1827) 32; MOR. Syst. Verz. (1845/46) 102; ZOLL. Syst. Verz. (1854) 66.—*Pontederia dilatata* BUCH.-HAM. in SYMES, Emb. Ava (1800) 475, pl.; ANDR. Bot. Rep. 7 (1807) t. 490; ROXB. Fl. Ind. ed. 2, 2 (1832) 123.—*Monochoria hastaeifolia* PRESL, Rel. Haenk. 1 (1827) 128; MIQ. Fl. Ind. Bat. 3 (1859) 548; Sum. (1860) 269; HOOK. f. Fl. Br. Ind. 4 (1892) 362; RENDLE, J. Bot. 39 (1901) 177; GIBBS in J.L.S. Bot. 42 (1911) 166; RIDL. Fl. Mal. Pen. 4 (1924) 344; CHERFILS, Fl. Gén. I.C. 6 (1934) 822.—*Pontederia sagittata* ROXB. Fl. Ind. ed. 2, 2 (1832) 124.—*Pontederia vaginalis*

(non BURM. f.) BLANCO, Fl. Fil. (1837) 255; ed. 2 (1845) 178; ed. 3, 1 (1877) 320, t. 466.—*Monochoria dilatata* KUNTH, En. 4 (1843) 134.—*Monochoria sagittata* KUNTH, l.c.—Fig. 1.

At an advanced age robust herb with erect or obliquely erect stems, up to 125 cm high; rhizome often long and strong, clothed with the remains of old sheaths. Petiole of radical leaves up to 60 cm long, of the floral leaves much shorter, its sheathing base much broadened. Inflorescences erect or suberect, at last horizontal or \pm deflexed, shortly stalked, dense. Pedicels erect or obliquely erect. *Perianth* somewhat lighter blue coloured than that of the preceding species. Filaments white. Top of the style densely patently short-hairy. *Capsule* ellipsoid, ± 1 cm long, Seeds oblong, $\pm \frac{5}{6}$ mm long, brown, with ± 10 very thin longitudinal ribs, between the ribs densely and very finely transversely striate.

Distr. Tropical SE. Asia and throughout *Malaysia*, not yet recorded from the Moluccas & Lesser Sunda Islands.

Ecol. From the plains up to ± 700 m, in and along freshwater pools, on canal banks, on mud-flats in rivers, along irrigation-ditches, sometimes in paddy-fields though there much less frequent than the preceding species, locally often numerous, but, on the whole, much less common than the preceding species.

Uses. Almost all parts of the plant, barring the roots, furnish a relished dish.

Vern. Many local names: *Bèbèngai* (N. Sumatra), *bèngai gondo* (W. Borneo), *bia bia*, *M*, *ètjèng* (with various additions), *M*, *S*, *labu labu kabangan* (Sumatra), *pingo*, *wéwéan*, *bengok*, *J*. Philippines: *Gabi-gabi*, *kosol-kósol*, *payau-páyau* (Bis.), *gabigabihan* (Tag.). Mal. Pen.: *chacha layar*, *kangkong ayer*. Papua: *maoa*.

Note. Herbarium specimens when not collected with the rhizome are difficult to distinguish from *M. vaginalis*, in the few cases they possess broadly rounded basal leaf-lobes instead of the typical acuminate or narrowed ones. Such specimens might be of hybrid origin.

var. elata (RIDL.) BACKER, *stat. nov.*—*Monochoria elata* RIDL. J. Str. Br. R. As. Soc. no 79 (1918) 99; Fl. Mal. Pen. 4 (1924) 345; HOLTUM, M.A.H.A. Mag. 5 (1935) 164, *cum icon*.

Robust, ca $1\frac{1}{2}$ m tall. Leafblades reduced, narrow lanceolate-hastate. Inflorescence elongated, to 12 cm. Anthers 5 mm long, the 6th 8 mm long.

Distr. Lower Siam, in *Malaysia*: Malay Peninsula (Kedah).

Ecol. In rice-fields, fl. Nov. Flowers close at 14.30 hours; the inflorescence lasts several days; flowers pale blue as in *var. hastata*. Recommended for ornamental purpose in shallow water.

Note. A distinct variety, not differing specifically from *M. hastata*, apparently of local distribution. The anthers in *var. hastata* measure mostly 3 mm, the 6th 5 mm.

3. *Monochoria cyanea* (F.v.M.) F.v.M. Fragm. Phyt. Austr. 8 (1872) 44; BAILEY, Queensl. Fl. 5

(1902) 1645; ?CHERFILS in Fl. Gén. I.C. 6 (1934) 824.—*Limnostachys cyanea* F.v.M. Fragm. 1 (1858) 24.—*Monochoria australasica* RIDL. J. Str. Br. R. As. Soc. 79 (1918) 100.

Blade absent or ovate, acuminate, sometimes cordate at the base. Flowers distinctly spaced in a raceme, apparently opening simultaneously. Stamens equal or subequal, filaments without appendages. Stigma with distinctly protruding papillar appendages. Fruit apparently appressed to the rachis. Seeds 2 by 1 mm, barrel-shaped, with 10-12 prominent ribs.

Distr. Trop. Australia, ?continental SE. Asia, might occur in *Malaysia*.

Notes. It is doubtful whether the records of *CHERFILS* from continental SE. Asia are right. *M. australasica* RIDL. belongs to this species; it appears to be a submerged or juvenile form. Seeds appear to be appreciably larger than in the other two species in which they are only 8-10-ribbed. Additional field observations are needed to verify whether *M. cyanea* possesses the same exploding mechanism of the fruit as is found in the two other species.

2. EICHHORNIA

KUNTH, En. 4 (1843) 129.—*Eichhornia* AUCT.

Aquatic herbs of sympodial structure, floating or creeping, rooting from the nodes; components of the sympodium annual or perennial. *Leaves* rosulate or alternate, often long-petioled, broadly ovate-rhomboid or linear-lanceolate. Inflorescence terminal, peduncled, spiciform, 2- to many-flowered, during anthesis erect, afterwards deflexed. *Perianth* zygomorphic or subactinomorphic, lilac blue, often with a yellow blotch, 6-fid, marcescent after anthesis. Stamens inserted in the throat of the corolla or deeper, decurved, unequal, often 3 longer, 3 shorter. Filaments inappendiculate, hairy in the Malaysian species. Anthers inserted near the base. Ovary sessile, 3-celled; cells many-ovuled. Style filiform. *Fruit* (never produced in *Malaysia*; not seen by me) membranous, many-seeded.

Distr. According to SOLMS, 5 spp. in tropical America; one of them naturalized in tropical Asia and elsewhere.

Ecol. Inhabitants of stagnant or slow-moving fresh water, often growing gregariously.

1. *Eichhornia crassipes* (MART.) SOLMS in A.D.C. Mon. Phan. 4 (1883) 527; WIGMAN, Teysmannia 8 (1897) 353; *ibid.* 19 (1908) 621, *cum tab.*; BACK. Ann. J.B.B. Suppl. 3 (1909) 400; KOORD. Exk. Fl. 1 (1911) 284; VAN WELSEME, Trop. Natuur 1 (1912) 2-5, 31, 57-60, *cum tab.*, 62; KOENS, *ibid.* 2 (1913) 14, 96, 111; BEUMÉE, Trop. Natuur 7 (1918) 94; WITKAMP, *ibid.* 8 (1919) 30, 110; *ibid.* 14 (1925) 157; MERR. En. Born. Pl. (1921) 111; En. Philip. 1 (1922) 200; KOORD. Exk. Fl. Atlas (1923) 218, f. 440; BACK. Handb. Fl. Jav. 3 (1924) 42; WITKAMP, Trop. Natuur 14 (1925) 157, *cum tab.*; HEYNE, Nutt. Pl. (1927) 435; BACK. Onkr. Suiker. (1928) 187, Atl. t. 200; RIDLEY, Disp. Pl. (1930) 231; OCHSE & BAKH. V. D. BR. Veg. (1931) 610, t. 372; DE VOOGD, Trop. Natuur 21 (1932) 62, f. 7; CHERFILS. Fl. Gén. I.C. 6 (1934) 826; BURK. Dict. 1 (1935) 891; PENFOUND & EARLE, Ecol. Mon. 18 (1948) 447-472; BACK. Bekn. Fl. Java em. ed. 10 (1949) fam. 223, p. 2; STEEN. Fl. Sch. Indon. (1949) 135; VAAS, Contr. Gen. Agr. Res. Sta. no 120 (1951) 3-59.—*Pontederia crassipes* MART. Nov. Gen. Sp. (1823) 9, t. 4.—*Eichhornia speciosa* KUNTH, En. 4 (1843) 131.—*Heteranthera formosa* MIQ. Linnaea 5 (1843) 61.—*Piaropus crassipes* BRITTON, Ann. N.Y. Ac. Sc. 7 (1893) 241.—Fig. 2-3.

Floating herb with a very short leafy main-stem, sending down a large bunch of long fibrous roots, in very shallow water sometimes rooting in the mud, 30-50 cm high (in flower), rarely higher,

emitting axillary, moderately long stolons the top of which grows out into a new plant, which readily separates from the mother-plant and begins an



Fig. 2. *Eichhornia crassipes* (MART.) SOLMS in Djombang, E. Java (DE VOOGD).



Fig. 3. *Eichhornia crassipes* (MART.) SOLMS at Djombang, E. Java (DE VOOGD).

independent life. *Leaves* radical, rosulate, emerged. Petioles spongy: in young specimens short and very much swollen in or below the middle, in adult ones much longer, up to 30 cm long, tapering almost from the base. *Leafblade* broadly ovate or rhomboid from a shallowly cordate, truncate, rounded or broadly cuneate base, very obtuse, finely and densely curvined, firmly herbaceous, quite glabrous, 7–25 cm long and wide. Inflorescences long-peduncled, peduncle with two closely approximate bracts: lower bract with a long tubular sheath and a small blade, upper bract almost entirely enclosed by the sheath of the lower, for the greater part tubular, apiculate. Flower-bearing axis very angular, up to 15 cm long, often much shorter. *Flowers* per inflorescence 3–35, usually simultaneously expanding and withering, very showy, said to be trimorphous (in Malaysia only a form occurs with 3 very short anterior filaments, the 3 other much longer; stigma at medium height between the anthers of the long and the short filaments). *Perianth-tube* 1½–1¾ cm long, with a green base and a pale top, slightly curved; segments ovate to oblong or obovate, lilac; posterior segment with a bright yellow, blue-bordered median blotch, 3–3¼ cm long; more forward placed segments gradually smaller. Stamens curved; filaments glandular hairy. Style glabrous; stigma hairy. *Fruit* never produced in Malaysia.

Distr. Native of Brazil, introduced and naturalized in several other tropical countries, e.g. SE. Asia, Queensland, Guam, &c., in *Malaysia*: Sumatra, Malay Peninsula, Java, Borneo, Philip-

pines. In 1894 introduced in the Buitenzorg Botanic Gardens, where it thrived exceedingly well and by its exuberant growth soon became a nuisance. Cart-loads of it were thrown in the Tji Liung (river which crosses the Botanical Gardens) and were carried downwards by it to waters in the plains; it was also sent out as an ornamental or as a surface-covering for fishponds. At present spread from the plains up to ± 1600 m. About 1902 it appeared in several places in continental SE. Asia; in the Philippines it was introduced as an ornamental about 1912.

Ecol. Inhabits stagnant or slow-moving fresh water such as broad rivers near their banks, lakes, canals, railway-ditches, morasses, pools, tanks; exceptionally and only temporarily on inundated paddy-fields. By its luxuriant growth and extremely rapid propagation the plant has become locally a very troublesome weed, covering entirely the surface of the water, crowding out all other plants, choking watercourses and greatly hampering water-traffic and fishing. At present it is tried to eradicate this pest by spraying with chemicals (VAAS, *l.c.*). By a sudden rush of rising water, caused by heavy rains, great masses of it may be torn loose, forming, as it were, floating islands, which are carried by rivers to the sea where they immediately die off.

Uses. Besides for the purposes mentioned above the plant is used as a manure and for fattening pigs. Young leaves, petioles and inflorescences are sometimes used as a vegetable.

Vern. Many names. The principal of these are:

Waterhyacinth(h), D, E, *bia bia*, M, *ètjèng* (with various additions), M, S, *gèndot*, S, *ilung ilung*, *mampau*, *mampoh*, *napping*, *béngai gondo* (Born.), *sékar bopong*, *wéwéhan*, *béngok*, J. Mal. Pen.:

kémèling télur, *kéladi bunting*, *bunga jamban*.

Note. The plant often displays gregarious flowering and presents than a very beautiful spectacle. It contains much potash.

Excluded

Monochoria dubia (BL.) MIQ. Fl. Ind. Bat. 3 (1859) 549, based on *Pontederia dubia* BL. En. Pl. Java 1 (1827) 33 = *Hydrocharis dubia* (BL.) BACK. Handb. Fl. Jav. 1 (1925) 64 (Syn. *Hydrocharis asiatica*

MIQ. Fl. Ind. Bat. 3, 1856, 239); cf. also HALLIER f., Nova Guinea 8 (1913) 917; DANDY, J. Bot. 70 (1932) 328.