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MOLLUGINACEAE

P.S. Short

Herbs or sometimes small shrubs, occasionally succulent. *Leaves* opposite or whorled or alternate, simple, entire; stipules present or absent. *Flowers* usually small and inconspicuous, usually bisexual, actinomorphic, solitary in the axils or in cymose inflorescences. *Perianth* segments commonly 5, persistent, free or sometimes connate at the base, imbricate, sometimes distinct sepaloid and petaloid segments developed. *Staminodes* absent or present and petaloid, small and usually free. *Stamens* (2) 5–10 (or more), filaments distinct or basally connate; anthers tetrasporangiate and dithecal, opening by longitudinal slits. *Gynoecium* usually of 2–5 carpels united to form a compound, superior ovary, the ovary multilocular below but divisions not extending throughout; ovules 1–many in each locule, placentation axile; styles usually as many as locules. *Fruit* dry, usually a capsule, indehiscent or opening loculicidally or by transverse slits. *Seeds* sometimes with a caruncle, embryo curved around a starchy perisperm, true endosperm absent.

Cronquist (1981) indicated that the family consists of about 13 genera and nearly 100 species, most of which occur in subtropical and tropical regions of the world. Three genera and eight species are found in the N.T.

The family is often included in the Aizoaceae, while both molecular and morphological analyses also place it near families such as the Amaranthaceae, Cactaceae, Caryophyllaceae, Nyctaginaceae, Phytolaccaceae and Portulacaceae.

Macarthuria is, following Cronquist's classification, retained here but if Mabberley (2008) is followed then *Macarthuria* is placed in the family Limeaceae.

Taxonomic references: Backer (1951); Cronquist (1981); Endress & Bittrich (1993); Lepschi (1996); Nee (2004); Hassan *et al.* (2005); Mabberley (2008).

1	Subshrub or shrub; stem leaves alternate; petals present	**Macarthuria**
1:	Herbs; stem leaves opposite or seemingly whorled; petals absent	**2**
2	Seeds with a caruncle terminating in a filiform appendage	**Glinus**
2:	Seeds lacking a caruncle	**Mollugo**

GLINUS L.

Herbs, annual or perennial. *Leaves* with those at the base in a rosette; cauline leaves opposite, alternate or spuriously whorled, all leaves entire or obscurely dentate, petiolate; stipules small and falling. *Flowers* axillary, clustered, pedicellate or subsessile. *Perianth* segments (tepals) 5, herbaceous but with scarious and often with white margins, often of unequal length, free. *Petals* absent. *Staminodes* usually present, external to stamens and fewer in number, petaloid, subulate or bifid. *Stamens* 3–20, free or fascicled, filaments filiform. *Ovary* with 3–5 locules, ovules few to many per locule. *Styles* 3–5, erect, spreading or recurved, persistent. *Fruit* a 3–5-valved, membranous, loculicidal capsule. *Seeds* with a white caruncle with a slender appendage around the periphery of the seed.

Widespread, mostly tropical or subtropical genus, with *c.* six species. Four species occur in Australia and all are in the N.T., with two or possibly three in the D.R.

The genus is sometimes included, as section *Glinus*, in *Mollugo*.

Taxonomic references: Fosberg (1995); Short (2002); Endress & Bittrich (1993).

1	Young branchlets with an indumentum of stellate hairs	**G. lotoides**
1:	Young branchlets glabrous or with simple hairs	**2**

2	Flowers sessile, single and axillary; stamens 2 per flower	**G. sessiliflorus**
2:	Flowers all or mostly on distinct pedicels and normally several in an inflorescence; stamens 3 or more	**3**
3	Stamens 3–5 per flower; perianth segments 3–4.5 mm long	**G. oppositifolius**
3:	Stamens 15–20 per flower; perianth segments 6–7 mm long	**G. orygioides**

G. lotoides L.

Mollugo lotoides (L.) Kuntze
M. glinus A. Rich.
M. hirta Thunb.

Annual or perennial *herbs* with stem and branches prostrate to ascending and to 10–40 cm long, with conspicuous indumentum of stellate hairs. *Cauline leaves* barely petiolate or with stellate-hairy petioles to *c.* 1 cm long, the lamina mostly very widely obovate to obovate, 8–23 mm long, 7–14 mm wide, margins entire, both surfaces greyish-green and with a moderate to dense indumentum of stellate hairs. *Flowers c.* 3–8 in axillary clusters, near-sessile or on stellate-hairy pedicels to *c.* 5 mm long. *Perianth* segments 6–7 mm long, externally stellate-hairy but internally glabrous, 1 or 2 segments thin and entirely herbaceous, remaining segments with scarious margins. *Stamens c.* 10–15, some staminodes also present. *Ovary* glabrous. *Styles* 5, 1–1.5 mm long. *Capsule* 4.5–6 mm long, 5-valved, 4–6 mm long, enclosed within the perianth. *Seeds* subreniform, *c.* 0.4 mm long, shiny reddish-brown, with lines of tubercles. *Flowering & fruiting*: throughout the year.

Fig. 1 (*Cowie 3263*); Pl. 1 (*Cowie 12469*).

Southern Europe, Africa, southern and south-east Asia, Australia (all mainland States) and America. Widespread throughout the N.T. and found in an array of habitats, including the margins of waterholes and on black soil plains. In the D.R. it occurs on floodplains and billabongs associated with the Adelaide and Reynolds rivers.

G. oppositifolius (L.) A. DC.

Mollugo oppositifolia L.
M. spergula L.

Annual *herbs* with stem and branches usually prostrate and to *c.* 50 cm long, glabrous or with simple, white, curled hairs especially on young growth. *Cauline leaves* not or barely petiolate but tapering gradually to the base, elliptic, ovate or obovate, 10–35 mm long, 4–13 mm wide, margins entire or obscurely dentate, glabrous or with curled simple hairs. *Flowers c.* 3–10 in axillary clusters, pedicels 2–7 mm long. *Perianth* segments 3–4.5 mm long, greenish but for scarious margins, glabrous or with a few scattered hairs. *Stamens* 3–5. *Ovary* glabrous. *Styles* 3 or 4, less than 0.5 mm long. *Capsule* 2.5–3.5 mm long, 3–4-valved, enclosed within the perianth. *Seeds* subreniform, *c.* 0.5 mm long, shiny reddish-brown, with lines of tubercles. *Flowering & fruiting*: throughout the year.

Fig. 1 (unvouchered); Pl. 2 (*Stuckey 443*).

Europe (?), Africa, Asia and Australia (all mainland States). Widespread in the N.T. in a variety of habitats, *e.g.* coastal *Melaleuca* swamps, depressions in *Eucalyptus* woodland, dry river beds and floodplains.

G. orygioides F. Muell.

Mollugo orygioides (F. Muell.) F. Muell. ex Benth.

Perennial, fleshy *herbs* with spreading branches to *c.* 30 cm long, mostly glabrous but with simple, white, curled hairs especially on young growth. *Cauline leaves* tapering gradually or somewhat abruptly to the base or with indistinct petioles to *c.* 3 mm long; lamina obovate or elliptic, 7–20 mm long, 3–13 mm wide, margins entire, glabrous or with a few curled simple hairs. *Flowers* 3–6 in axillary or terminal clusters, pedicels 4–7 mm long. *Perianth* segments 5–7 mm long, dimorphic; outer 2 segments *c.* 2.5 mm wide, greenish and with very narrow scarious margins; inner segments *c.* 5 mm wide, with a narrow greenish midrib and broad, white or pinkish scarious margins, glabrous. *Stamens c.* 25. *Ovary* glabrous. *Styles* 3, 2 mm long. *Capsule* 4–5 mm long, 3-valved, enclosed within the perianth. *Seeds* subreniform, 1–1.2 mm long, shiny, dark red, with lines of tubercles visible but individual tubercles not always pronounced. *Flowering & fruiting*: Mar., May, Sept.

Inland Australia (W.A., N.T., S.A., Qld, N.S.W.). The few N.T. specimens are all from clay flats below *c.* 19° S.

G. sessiliflorus P.S. Short

Annual *herbs* with prostrate stems to *c.* 12 cm long, with simple, white, straight to somewhat curled, spreading hairs scattered to dense on young growth. *Leaves* shortly to manifestly petiolate; petiole *c.* 0.5–11 mm long; lamina mostly circular to elliptic or very widely obovate to obovate,

occasionally oblanceolate, 1–15 mm long, 0.8–5 mm wide, margins entire, with simple hairs as on branches. *Flowers* single, axillary, sessile. *Perianth* segments elliptic to narrowly elliptic or obovate, 1.9–3 mm long, 0.6–1.1 mm wide, 2 or 3 segments mainly herbaceous but others with pronounced, whitish, scarious margins, the herbaceous parts of all segments sparsely to manifestly hairy. *Stamens* 2. *Ovary* glabrous, trilocular. *Styles* 3, sessile or almost so. *Capsule* 1.6–3 mm long, 3-valved, enclosed within the perianth. *Seeds* subreniform, 0.33–0.4 mm long, shiny reddish-brown, smooth or tuberculate; with a white caruncle with a slender appendage around the periphery of the seed. *Flowering & fruiting*: June–Dec.

Fig. 1 (*Michell 2504*).

Not known from the D.R. but possibly in the region. Currently known from a billabong at Nourlangie Rock, from open grassland on the fringe of the floodplain at Ja Ja, and a drainage depression in the Edith River area.

MACARTHURIA Hügel ex Endl.

Perennial *herbs* or *shrubs*, glabrous or hairy; stems terete. *Leaves* basal to cauline, alternate, sessile or on short petioles, sometimes reduced to scales. *Flowers* pedicellate, 1–many in cymose, lateral or terminal inflorescences. *Perianth* of sepals and petals or (not N.T.) petals absent. *Sepals* 5, free. *Petals* 5, free. *Staminodes* absent. *Stamens* 8, inserted on a staminal ring. *Ovary* 3-locular, usually 1 ovule per locule. *Style* 3-branched. *Fruit* a loculicidal capsule. *Seeds* carunculate.

Genus of about ten species, all endemic to Australia.

Taxonomic reference: Lepschi (1996).

M. vertex Lepschi

M. apetala auct. non Harv.
M. ephedroides auct. non C.T. White
M. sp. A, Rye *in* Wheeler *et al.* (1992), *Fl. Kimberley*, p. 140

Subshrub or shrub with prostrate to erect branches, 15–100 (200) cm tall, glabrous or with short, rigid hairs mostly 0.1–0.2 mm but in some specimens 0.3 mm long. *Stem* and branches terete, angular, slender, often greenish or glaucous. *Leaves* decreasing in size along the branches, sessile or obscurely petiolate, basal leaves of young plants with the lamina linear-oblanceolate or spathulate, to 55 mm long, 5 mm wide but the cauline leaves of both young and old plants mostly linear, 2–20 mm long, 0.3–0.5 mm wide. *Cymes* of 1–6 flowers at the apex of the flowering branches. *Bracts* triangular, 0.5–1.3 mm long, herbaceous, brown. *Pedicels* 0.5–6 mm long. *Sepals* ovate to narrowly ovate or obovate, 1.9–4.8 mm long, 0.5–2.5 mm wide, mostly herbaceous but sometimes with narrow scarious margins, outer surface glabrous or hairy. *Petals* elliptic to narrowly elliptic or oblanceolate, *c.* 2.5 mm long, *c.* 0.6 mm wide, white or creamy. *Staminal ring c.* ⅓ the length of the ovary. *Style* branches *c.* 0.4 mm long. *Capsule* ovoid or ellipsoid, 2–3.5 mm long. *Seeds* broadly comma-shaped, 1.5–2 mm long, shiny, felty-black, tuberculate, with a conspicuous, whitish or translucent, somewhat papery caruncle. *Flowering & fruiting*: throughout the year.

Pl. 3 (unvouchered).

Northern Australia (W.A., N.T.) from the Kimberley to eastern Arnhem Land. In the N.T. north of *c.* 16° S and seemingly confined to the sandstone country, growing on escarpments in heathland, woodland or *Triodia* communities and also in sandy, alluvial soils at the base of escarpments. It has not been recorded for the D.R.

A variable species, at least in regard to indumentum, and possibly requiring further study.

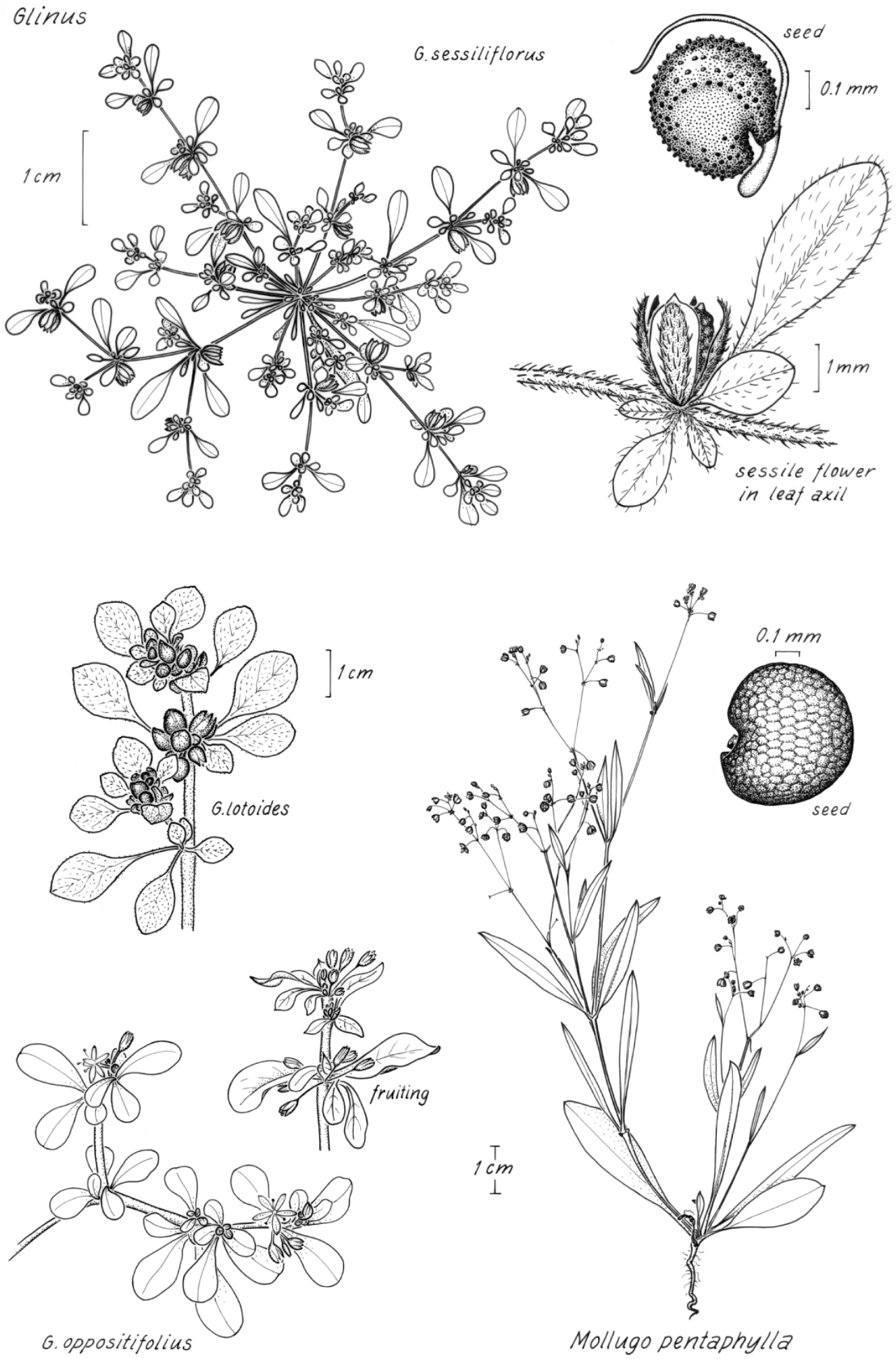
Glinus
G. sessiliflorus
1 cm
seed
0.1 mm
1 mm
sessile flower
in leaf axil
1 cm
G. lotoides
G. oppositifolius
fruiting
0.1 mm
seed
1 cm
Mollugo pentaphylla

Fig. 1

MOLLUGO L.

Herbs, annual or perennial under favourable conditions, glabrous. *Leaves* caducous and radical and also cauline; cauline leaves opposite, whorled or in fascicles, entire; stipules caducous. *Flowers* single or in pedunculate inflorescences. *Perianth* segments (tepals) 5, imbricate in bud, free, mostly green but with scarious margins. *Petals* absent. *Staminodes* absent. *Stamens* 3–5, shorter than the tepals, free. *Ovary* with 3 locules, ovules many. *Stigmas* 3, sessile or on short styles. *Fruit* a 3-valved, thin-walled, loculicidal capsule. *Seeds* lacking a caruncle and appendage.

Cosmopolitan genus with *c.* 35 species. Three species in the N.T. but only *M. pentaphylla* in the D.R.

Taxonomic reference: Endress & Bittrich (1993).

1	Perennial herb or subshrub; stigmas on styles 1.5–1.7 mm long; capsule manifestly 3-lobed	**M. molluginis**
1:	Annual or ephemeral herb; stigmas sessile or nearly so; capsule 3-locular but not manifestly lobed	**2**
2	Leaves sessile, cauline leaves linear, 5–15 mm long, 0.2–1 mm; flowers 1–5 per leaf whorl	**M. cerviana**
2:	Leaves sessile or shortly petiolate, cauline leaves narrowly elliptic or lanceolate, 10–65 mm long, 1–12 mm wide; flowers axillary or terminal in pseudo-racemose inflorescences	***M. pentaphylla**

M. cerviana (L.) Ser.

Pharnaceum cerviana L.

Annual or ephemeral *herb* 3–18 cm tall, glabrous, branches slender and often pinkish. *Leaves* 5–13 per whorl, sessile, mostly linear, 5–15 mm long, 0.2–1 mm, in some large plants basal leaves linear-oblanceolate, all leaves greenish or somewhat glaucous, apically blunt or with a very small, soft mucro. *Flowers* 1–5 per leaf whorl, each on a slender pedicel (3) 8–17 mm long. *Perianth* segments obovate, 1.6–2.7 mm long, 0.8–1.3 mm wide, the midrib green and venation usually evident, margins scarious, whitish. *Stamens* 5, slightly shorter than perianth segments. *Stigmas* sessile. *Capsule* ellipsoid, 1.8–2.6 mm long, enclosed or almost so within the perianth. *Seeds* subreniform, longest axis 0.35–0.4 mm, brown. *Flowering & fruiting*: mostly Dec.–May.

Wide-spread in the Old World (Australia: W.A., N.T., S.A., Qld, N.S.W.) and common in the N.T. below *c.* 19° S. In a wide range of habitats, from sandy creek beds to cracking clay plains and saline sand on the edge of lakes.

M. molluginis (F. Muell.) Druce

Trigastrotheca molluginea F. Muell.
M. trigastrotheca F. Muell., *nom. illeg.*

Perennial *herb*, somewhat sprawling and cushion-like to erect, branches to 20 cm long. *Leaves* 2 or 3 per fascicle, sessile, linear or linear-elliptic or linear-oblanceolate, 15–45 mm long, 1–2.5 mm wide, glabrous, acute. *Flowers* in 1 or more bracteate inflorescences per leaf whorl. *Perianth* segments elliptic or ovate, 3–4.3 mm long, 1.6–2 mm wide, midrib greenish, the margins broad, scarious and white. *Stamens* 5, 2–3.5 mm long, basally broadly dilated. *Stigmas* on styles 1.5–1.7 mm long. *Capsule* 2–3 mm long, manifestly 3-lobed. *Seeds* subreniform, longest axis 1–1.2 mm, dark red-brown, minutely papillate. *Flowering & fruiting*: Jan.–Oct.

Australia (W.A., N.T.). In the N.T. found between *c.* 17° and 21° S and west of *c.* 134° E. Common in sandy soils and frequently associated with *Triodia* but also recorded from woodland on laterite hills and from granitic soils.

***M. pentaphylla** L.

M. stricta L.

Annual *herb*, branches angular, ascending to erect, to 35 cm long, glabrous, green or reddish-brown. *Leaves* 2–7 per whorl, sessile or shortly petiolate, mostly narrowly elliptic or lanceolate, at least the basal ones sometimes obovate to oblanceolate, all leaves 10–65 mm long, 1–12 mm wide, 1-nerved, the nerve raised on the lower surface, apically rounded to acute and with a small mucro. *Flowers* axillary or terminal in pseudo-racemose inflorescences, pedicels 1.5–7 mm long. *Perianth* segments elliptic, ovate or somewhat circular, 1.5–1.8 mm long, 0.8–1 mm wide, the midrib green, margins scarious, white or pinkish. *Stamens* 3–5. *Stigmas* sessile or almost so. *Capsule* subglobular, *c.* 2 mm long, enclosed or almost so within the perianth.

Seeds c. 10, reniform, longest axis 0.5–0.6 mm, smooth to finely tuberculate, dark reddish-brown. *Flowering & fruiting*: Sept.–May.

Fig. 1 (*Brennan 1007*; *Short 4785*); Pl. 4 (unvouchered).

India to China, Japan, Fiji and Australia (N.T., Qld).

Commonly treated in Australian checklists (*e.g.* Hnatiuk 1990; Henderson 1993; Dunlop *et al.* 1995) as a native species. However, it was not treated by Bentham in *Flora australiensis* and appears to have been first recorded for Australia in the 1880s, with Bailey (1900, as *M. stricta*) making reference to a Queensland record in Mueller's *Second Systematic Census of Australian Plants*. Ewart & Davies (1917) did not record the species for the N.T. and the earliest record at DNA for its presence is of a specimen collected from the Darwin area in 1961. It is still only known in the Top End, having been collected from disturbed sites such as gardens and roadside verges in the Darwin area, on the Tiwi Islands, at a campsite at Nourlangie, and at Murgenella. Such evidence indicates that it may be an introduced species.

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Pl. 1 *Glinus lotoides* (Photo: B.M. Stuckey)

Pl. 2 *Glinus oppositifolius* (Photos: B.M. Stuckey)

Pl. 3 *Macarthuria vertex* (Photo: B.M. Stuckey)

Pl. 4 *Mollugo pentaphylla* (Photo: B.M. Stuckey)