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# ARISTOLOCHIACEAE

*C.P. Mangion & I.D. Cowie*

*Herbs*, shrubs or vines, glabrous or with simple eglandular hairs, those with woody stems mostly with broad medullary rays, sap not obvious; roots in herbaceous taxa often tuberous. *Leaves* alternate, simple, entire or lobed, often cordate, palmately nerved, petiolate, sometimes pellucid punctate, aromatic; stipules absent. *Flowers* bisexual, actinomorphic or zygomorphic, solitary, racemose or in fascicles, terminal or axillary, with or without bracts. *Calyx* usually enlarged and petaloid, basally tubular or campanulate and with a limb which is symmetrically 3-lobed or unilateral and entire or unilateral and lobed, often highly coloured and malodorous. *Petals* usually absent or sometimes well developed (not Australia). *Stamens* 4 to many, usually 6 or more in 1 or 2 series around the apex of the ovary or adnate to the stylar column and forming a gynostegium; filaments short, thick, free or scarcely distinguished from the column; anthers tetrasporangiate and dithecal, opening extrorsely by dorsal slits, free or united with style; pollen subspherical and inaperturate. *Gynoecium* of 4–6 carpels forming a superior or inferior ovary; ovary 4–6-locular, with parietal or axile placentas, the styles united into a single column; stigma 3–many-lobed; ovules numerous in 2 series in each locule, anatropous, horizontal or pendulous. *Fruit* a capsule, often opening from the base upward or less often indehiscent. *Seeds* numerous, usually flat, with copious hard or fleshy endosperm and minute embryo.

A mostly tropical and subtropical family with some species in temperate regions. Up to 15 genera and 450–600 species recognised worldwide, with *Aristolochia* and *Pararistolochia* in Australia but only the former in the N.T. *Pararistolochia* is sometimes treated as a synonym of *Aristolochia*.

The Aristolochiaceae have co-evolved with swallowtail butterflies (Papilionidae), with the butterfly larvae feeding exclusively on members of the family. Larvae tolerate the aristolochic acids produced by the plants, but the poisonous chemicals deter predators. Flowers are often pollinated by flies.

Taxonomic references: Cronquist (1981); Matthew (1983); Ding Hou (1984); Verdcourt (1986); Huber (1993); González (2004).

## ARISTOLOCHIA L.

Erect, twining *herbs* or shrubs, at least with perennial rootstock. *Leaves* entire or 3-lobed, sometimes cordate, 3–7-nerved from base, sometimes with an undeveloped axillary stipule-like leaf. *Flowers* irregular, axillary, solitary or in fascicles or racemes, with coloured perianth adnate to ovary below, elongate-tubular, variously bent, usually inflated at base around the style, hairy inside, narrowed at the throat; limb open, recurved or entire, or 3–6-lobed outside of the D.R. *Stamens* usually 6 or more; anthers sessile in a row adnate to the style or dorsal side of the stigma. *Ovary* inferior, usually 6-locular; style short, 3–6-lobed at apex. *Capsule* dehiscent along septa, with 6 valves or splitting through the placentas. *Seeds* compressed, mostly winged all round or thick with an elaiosome.

Depending on circumscription, estimated to have 120–450 species, most of which occur in tropical and subtropical regions. Nine species, four of which are naturalised, occur in Australia. The two native and one naturalised species found in the N.T. are treated here.

Some species of *Aristolochia* are used for medicinal purposes but misuse can cause renal failure and even death.

Taxonomic references: Verdcourt (1986); Parsons (1996); Huber (1993); González (2004); Ross & Halford (2007).

- |    |   |                    |
|----|---|--------------------|
| 1  | Twining climber to tree tops; flowers rarely solitary, leaves obovate-oblong .... | * <b>A. indica</b> |
| 1: | Erect herbs or short climbers; flowers solitary, leaves oblong to linear .....    | <b>2</b>           |

- 2 Leaves linear to linear-lanceolate and never cordate at the base, basal lobes absent; petioles less than 5 mm long ..... **A. holtzei**
- 2: Leaves oblong or lyrate to linear but if linear then cordate with rounded basal lobes; petioles more than 7 mm long ..... **A. pubera**

**A. holtzei** F. Muell.

*A. thozetii* var. *angustissima* Benth.

*Herb* to c. 50 cm tall with perennial rootstock and annual aerial parts, stems usually erect, resprouting and flowering after fire. *Leaves* linear to linear-lanceolate, 40–150 mm long; petioles up to 5 mm long. *Flowers* solitary, axillary; pedicels 10–55 mm long but in mature flowers not easily distinguished from the ovary. *Perianth* variously coloured pale green, cream, purplish and brown, outer surface glabrous, 20–50 mm long including the lip, constricted below the oblique utricle, slender and cylindrical above it; lip linear, twisted, as long or shorter than the tube. *Capsule* stipitate, obovoid to globular, variable in size c. (5) 9–15 mm wide, 15–30 mm long. *Seeds* many, triangular, to 4 mm long, the convex surface tuberculate. *Flowering*. Apr.–Dec. *Fruiting*. June–Apr.

Fig. 1 (*Egan 2520*); Pl. 1 (*Cowie 10635*); Pl. 2 (unvouchered).

Australia (N.T., Qld). In the N.T. recorded from Kakadu N.P. and the immediate Darwin area. Growing in eucalypt woodland and remnant disturbed areas on a variety of soils.

\***A. indica** L.

Twining *vine* reaching tree tops. *Leaves* obovate-oblong with acuminate tips, 55–140 mm long, (15) 20–55 mm wide, glabrous or rarely with sparse hairs. *Flowers* in 1–many-flowered racemes; pedicels and immature ovary together up to 40 mm long. *Perianth tube* with 1 lip. *Corolla* to 55 mm long, cream to purplish-brown. *Stamens* 6. *Ovary* thin to 25 mm long. *Style* to 3 mm. *Stigmatic lobes* 6, erect. *Capsule* ribbed, to 50 mm long, dehiscent. *Seeds* many, triangular, winged, c. 7 mm long. *Flowering*. Nov.–May. *Fruiting*. Feb.–May. **Birth Wort.**

Fig. 1 (*Mangion 125*); Pl. 3 (unvouchered).

Occurs from Sri Lanka and India to south-east Asia and Australia (N.T.). In the N.T. it has only been found at Channel Island in Darwin Harbour where it grows in disturbed vine thicket. Plant numbers seem to have decreased in the last ten years. It was probably introduced for medicinal purposes when a leprosarium operated on the island.

**A. pubera** R. Br.

*A. nauseifolia* Michael J. Parsons

*A. strictiflora* Duch.

*A. thozetii* F. Muell.

Prostrate or twining *herb* with a perennial rootstock and annual aerial parts, pubescent to almost glabrous. *Leaves* varying from obovate, lyrate or oblong to linear but if linear with a cordate base with rounded lobes; petioles (5) 10–20 mm long. *Flowers* solitary, axillary; pedicels 2.5–5.5 mm long, at the time of flowering the pedicel not easily distinguished from the ovary. *Perianth* from cream to dark brown, the outer surface pubescent or glabrous, 20–50 mm long including the lip, shortly constricted below the oblique utricle, slender and cylindrical above it; lip linear, straight or slightly twisted, about as long as the tube. *Style* broadly hemispherical, with 6 short narrow erect stigmatic lobes, surrounded at the base by a ring of gland-like horizontal lobes, immediately above the sessile anthers. *Capsule* stipitate, obovoid-globular, variable in size c. 9–15 mm wide, 2–3 mm long. *Seeds* many, triangular, up to 4 mm long, the convex surface tuberculate. *Flowering*. Dec.–May. *Fruiting*. Feb.–July.

Fig. 1 (*Brennan 2417*; *Hinz*, D149584; *Maconochie 2222*; *Russell-Smith 4845*); Pl. 4 (*Cowie 12852*).

Australia (N.T., Qld, N.S.W.). In the N.T. occurring in Kakadu N.P. and eastern Arnhem Land. Recorded in the D.R. from Mary River N.P.

Two leaf forms can be recognised in the N.T. collections. One has linear to sagitate or hastate leaves mostly with an acute apex, the other broader, oblong to pandurate leaves with an obtuse apex, both with rounded basal lobes. Although these two leaf forms have been recognised as distinct species, *i.e.* as *A. thozetii* and *A. pubera* respectively (Ross & Halford 2007), they are here treated as synonymous. In the N.T., plants with both forms commonly co-occur in small, mixed populations of a few dozen plants or more in one habitat and their ranges are largely sympatric. From collections, it seems that mixed populations outnumber those with a single leaf form. Moreover, within a population the forms appear to flower and fruit concurrently and no morphological characters other than leaf shape

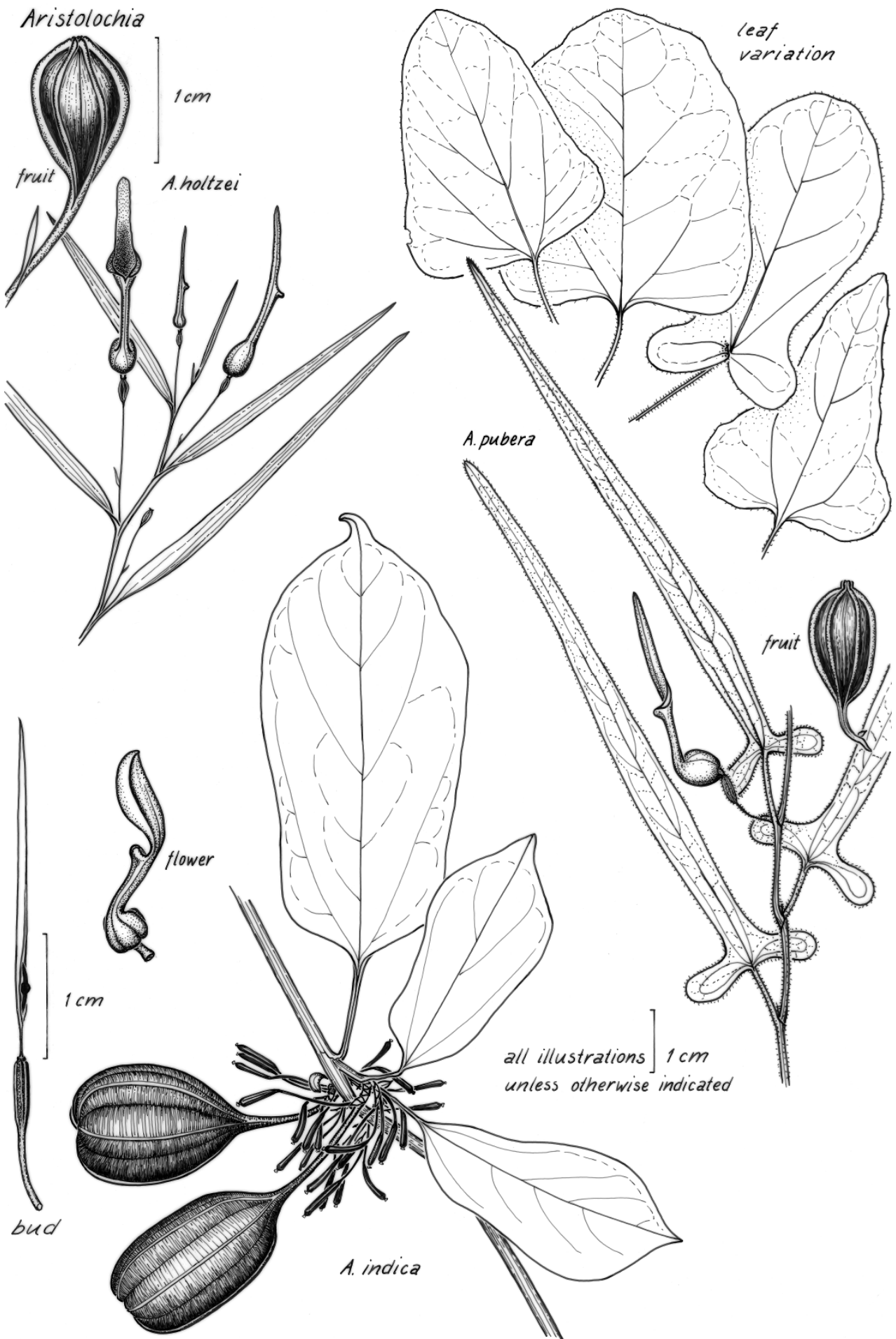


Fig. 1

were found to separate the taxa. While a number of other possible differences (twining herb, not creeping or erect herb; rootstock perennial, not specified for *A. pubera*; calyx mostly glabrous outside, not sparsely pubescent outside; utricle subglobose, not globose; limb oblong, not linguiform; seeds cordate-ovate, not triangular) are apparent from the treatment of Ross & Halford (2007), none of these differences are maintained in the N.T. material.

Parsons (1996) described *A. nauseifolia* Michael J. Parsons from northern Australia, citing a specimen from Elcho Island as being of this species. However, N.T. specimens do not support the recognition of this taxon, with the leaf and floral characteristics used to distinguish it from *A. pubera* being far too variable. *Aristolochia nauseifolia* was treated as a synonym of *A. thozetii* by Ross & Halford (2007); both are here treated as synonyms of *A. pubera*.

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Pl. 2 *Aristolochia holtzei* (Photo: B.M. Stuckey)



Pl. 1 *Aristolochia holtzei* (Photos: I.D. Cowie)



Pl. 3 *Aristolochia indica* (Photo: D.E. Bisa)



Pl. 4 *Aristolochia pubera* (Photos: I.D. Cowie)