

Most species prefer open, dry habitats (e.g. scrub, rocky slopes and sandy areas). The centre of diversity for the family is found in the Andean region, with some species preferring the lowlands while others may grow at altitudes of 3 500 m or more. Despite the number of species found in this region, the centre of origin for the family might actually be in southeastern Africa (Eriksson, 2007).

A few of the species in the family Basellaceae have economic importance as crops or ornamentals. Some of the species in the genus *Anredera* are cultivated as ornamentals. *Basella alba* is widely cultivated as a leafy vegetable and the cultivated forms of *Ullucus tuberosus* Caldas are an important, traditional food crop in the South American Andes (Sperling & Bittrich, 1993).

Two species from two genera of the Basellaceae are naturalised in southern Africa.

Key to the two naturalised genera [adapted from Sperling & Bittrich (1993)]:

- 1. Filaments outwardly reflexed in bud and anthesis, anthers dorsifixed, flowers shortly or distinctly pedicellate, sweet smelling ***Anredera***
- 1'. Filaments straight in bud and anthesis, anthers basifixed, flowers sessile, unscented ***Basella***

***Anredera* Juss.**

Twining vines with or without tuberous roots; stems glabrous or puberulent when young. **Leaves** alternate, with a short to distinct petiole; blade slightly fleshy, entire, lanceolate to broadly elliptic, cordate or obovate, apex obtuse to acuminate. **Inflorescence** a raceme or panicle, shortly to distinctly pedunculate; bracteoles distinct, subtending the flowers, triangular to broadly ovate. **Flowers** shortly or distinctly pedicellate, minute and often cleistogamous, bisexual (rarely functionally unisexual), fragrant. **Sepals** rhombic or rounded, ovate to elliptic, free, apex obtuse, whitish, yellowish or reddish at anthesis or pale, brownish or ± black, ± dry when in fruit. **Petals** ovate or elliptic to obovate, connate at the base into a short tube or rarely completely free, apex obtuse, at anthesis whitish, yellowish or reddish or in fruit pale, brownish or ± black, ± dry when in fruit. **Stamens** 5; filaments reflexed in bud, connate into a short tube, fused with tepals; anthers dorsifixed and longitudinally dehiscent. **Ovary** globose to pyriform; style 1 (undivided to 3-partite) or 3; stigmas clavate to capitate or 3-lobed (rarely bifid). **Fruit** globose to pyriform, at the base surrounded or completely enclosed by the persistent perianth. **Seed** erect, laterally flattened to nearly globose.

References: Sperling & Bittrich (1993), Egli (2002a), Vincent (2003), Eriksson (2007).

Anredera is a genus native to the New World occurring from Florida and Texas down to Argentina with the majority of species growing in the Andean region at altitudes between 1 500 and 3 500 m (Sperling & Bittrich, 1993; Eriksson, 2007). Some of the species with widespread distributions, however, also have wide altitudinal

ranges. The genus encompasses 12 species, with a few grown as ornamentals throughout the world, some of which have become locally naturalised in other tropical or subtropical areas (Eriksson, 2007).

***Anredera cordifolia* (Ten.) Steenis**

In: *Flora Malesiana*, Series I, Spermatophyta 5(3): 303 (1957).

=*Anredera baselloides* (Kunth) Baill.

=*Anredera cordifolia* (Ten.) Steenis subsp. *gracilis* Xifreda & Argimón

=*Boussingaultia baselloides* Kunth

=*Boussingaultia cordata* Sprengel

=*Boussingaultia cordifolia* Ten.

=*Boussingaultia gracilis* Miers

=*Boussingaultia gracilis* Miers var. *pseudobaselloides* (Hauman) L.H.Bailey

In South Africa the plant has been listed as *Anredera baselloides* (Wells, 1986; MacDonald *et al.*, 2003), a name considered a synonym of *A. cordifolia* (Schatz *et al.*, 2011).

Common names: bridal wreath, cascade creeper, lamb's tail, Madeira vine, mignonette vine (English); Madeiranker (Afrikaans); indaba-ingehlele, madilika (Zulu).

A twining vine with glabrous stems, often producing aerial tubers; rootstock and stem base producing an irregularly lump-shaped caudex with smooth greenish to brownish bark; aerial stems annual, twining, to 6 m long, softly succulent. **Leaves** well spaced, petiole up to 2.5 cm long; blade ovate to cordate, 2.5–10 × 1.5–7.5 cm, with cordate base, sometimes truncate to rounded, apex acute (rarely obtuse), slightly fleshy, green. **Inflorescence** a usually lax and much-branched (sometimes unbranched) raceme up to 50 cm long; pedicels 0.5–3.5 mm long; bracteoles persistent, connate at the base forming a cup. **Flowers** bisexual, strongly sweet-scented. **Sepals** broadly ovate to broadly elliptic, patent, 1.5–3 × 1.5–2.5 mm, distinctly shorter than petals (rarely of almost equal length), white at anthesis, ± dark brown when in fruit. **Petals** uniform, patent, elliptic to obovate, 2–4 × 1.5–2.5 mm, whitish-yellow, turning ± dark brown after anthesis. **Stamens** opposite petals; filaments recurved in bud. **Style** 1, 3-partite, sometimes almost to the base. **Fruit** surrounded by persistent perianth. **Distribution:** L, S, SA. (Fig. 72).

References: Eggli (2002a), Eriksson (2007).

Anredera cordifolia is a very variable species but infraspecific taxa are not recognised. It is native to the southern and central parts of South America (South Brazil, Paraguay and northern Argentina). It grows well in tropical and subtropical areas of the world and is often naturalised outside its native distribution range (Eriksson, 2007).

In southern Africa the plant is grown as a garden ornamental (Wells, 1986; Glen, 2002) because of its large, branched inflorescences (Fig. 73) consisting of masses

of showy, pedicellate, fragrant flowers (Fig. 74). (Eriksson, 2007). It is also grown for its edible tubers (Fig. 75), which are said to be rather tasteless, while elsewhere the leaves are cooked like spinach (Fig. 76) (Eggli, 2002a). *Anredera cordifolia* has been recorded as having anti-inflammatory properties (Vincent, 2003) while in South Africa it is used medicinally as a general anti-microbial agent (Von Ahlefeldt *et al.*, 2003; Singh, 2006) and specifically by the Vhavenda for the treatment of gonorrhoea and syphilis (Tshikalange, 2003). Aqueous extracts of the plant are, however, considered poisonous (Henderson, 2001).

It is considered a declared weed in the sub-region and is listed in South Africa as a category 1 invader, meaning it must be controlled or eradicated where possible (Henderson, 2001). The plant grows very quickly and along with its ability to reproduce vegetatively by way of the tubers, has become rather difficult to control (Eriksson, 2007). In addition seeds germinate profusely (Fig. 77).

While chemical control methods are available for the management of *Anredera cordifolia*, they are considered unsuitable due to the risk to non-target species growing beneath the smothering vines (Fig. 78). The South African and Australian Governments have done some initial research on the use of a South American, leaf feeding beetle, *Plectonocha correntina*, as a biological control agent (Cagnotti *et al.*, 2007; Biosecurity Australia, 2010). The risk to non-target species is considered negligible and no other potential consequences of the release were identified (Biosecurity Australia, 2010). During initial trials, *Basella alba* and *Anredera cordifolia* were among four plants allowing complete larval development (Biosecurity Australia, 2010), making this a potential biocontrol agent for the future.

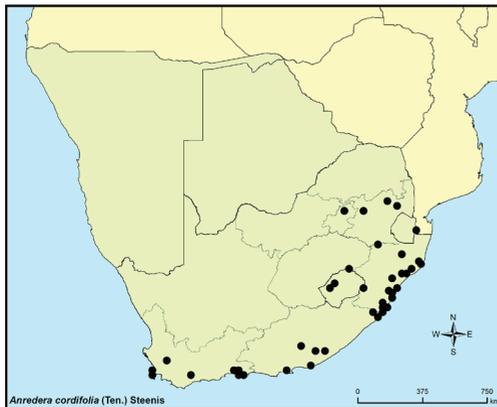


Fig. 72. Distribution map of *Anredera cordifolia* (Ten.) Steenis.



Fig. 73. Branched inflorescences of *Anredera cordifolia* (Ten.) Steenis.
(Picture by Geoff R. Nichols)



Fig. 74. Pedicellate, white flowers of *Anredera cordifolia* (Ten.) Steenis.
(Picture by Neil R. Crouch)



Fig. 75. Edible tubers of *Anredera cordifolia* (Ten.) Steenis.
(Picture by Neil R. Crouch)



Fig. 76. Leaves of *Anredera cordifolia* (Ten.) Steenis. (Picture by Neil R. Crouch)

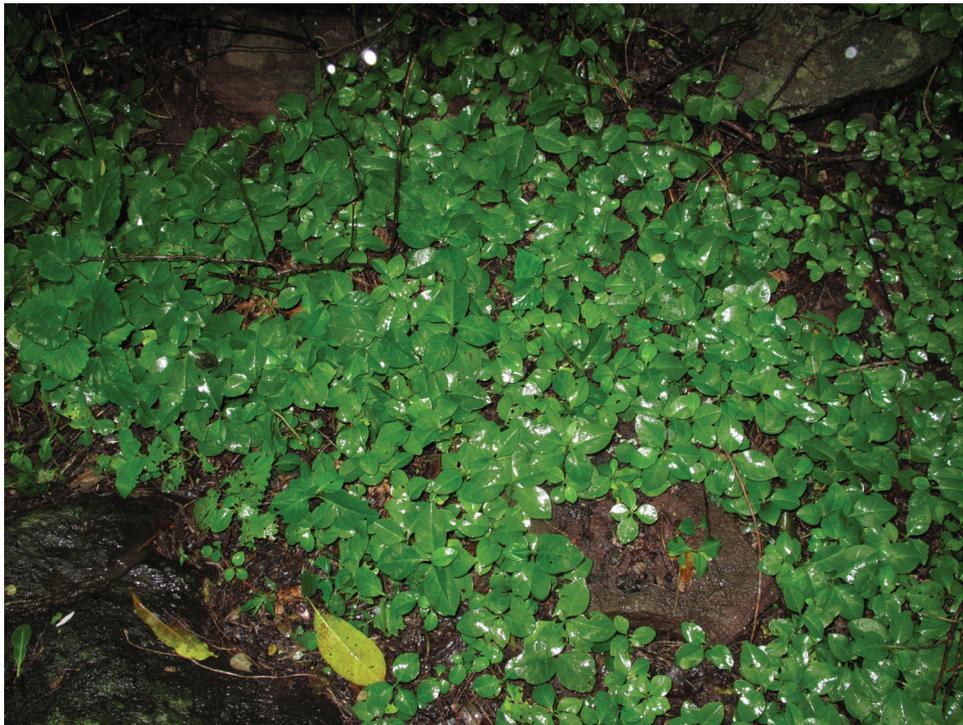


Fig. 77. Seedlings of *Anredera cordifolia* (Ten.) Steenis. (Picture by Neil R. Crouch)



Fig. 78. Vines of *Anredera cordifolia* (Ten.) Steenis smothering native plants.
(Picture by Geoff R. Nichols)

***Basella* L.**

Twining vines to procumbent or erect herbs with or without tuberous roots; stems glabrous or rarely puberulent when young, without tubers. **Leaves** alternate, slightly fleshy, with a short petiole; blade lanceolate to broadly elliptic or cordate, entire, apex obtuse to acuminate. **Inflorescence** a branched or unbranched spike, with or without peduncle; bracts \pm triangular; bracteoles minute to distinct, subtending the flowers, triangular to ovate, free. **Flowers** sessile, bisexual, unscented and often chasmogamous or cleistogamous. **Sepals** ovate to elliptic, free or partly connate into a short tube, shorter than to equalling petal length, apex \pm obtuse, greenish, whitish or reddish at anthesis, pale and \pm dry or purple to black, thick and juicy in fruit. **Petals** uniform, ovate to elliptic, connate at the base or up to $\frac{2}{3}$ of their length, apex \pm obtuse, greenish, whitish or reddish at anthesis, pale and \pm dry or purple to black, thick and juicy when in fruit. **Stamens** with filaments straight in bud (sometimes obscurely reflexed), connate and basally fused or fused into a short tube up to $\frac{3}{4}$ of their length; anthers dorsifixed and longitudinally dehiscent. **Styles** 3 or 1 that is 3-partite to the base or almost so. **Fruit** a globose to pyriform nutlet, at the base tightly enclosed (partly or completely) by the persistent perianth.

References: Sperling & Bittrich (1993), Egli (2002a), Eriksson (2007).

The genus *Basella* comprises five species. Madagascar is home to three of these (*B. excavata* Scott-Elliot, *B. leandriana* H.Perrier and *B. madagascariensis* Boivin ex H.Perrier) with another, *B. paniculata* Volkens, being native to South and East Africa. *Basella alba* L. has a pantropical distribution which is probably a result of its widespread cultivation (Sperling & Bittrich, 1993; Eriksson, 2007).

The invasive *Basella alba* may be distinguished from the indigenous *B. paniculata* in the following way [adapted from Eriksson (2007)]:

- 1. Inflorescence usually unbranched, petals fused to form urceolate flower with petals usually longer than 3.5 mm, perianth whitish to reddish at anthesis .
.....***Basella alba***
- 1'. Inflorescence branched, petals almost free and usually shorter than 3.5 mm, perianth greenish at anthesis(***Basella paniculata***)

***Basella alba* L.**

In: *Species Plantarum* 1: 272 (1753a).

- =*Basella nigra* Lour.
- =*Basella rubra* L.
- =*Gandola alba* Rumph. ex L.
- =*Gandola rubra* Rumph. ex L.

Common names: Ceylon spinach, Indian spinach, Malabar nightshade, Malabar spinach (English).

Stem twining vine to procumbent or erect herb up to 4–8 m long; stem slender, glabrous, green or purplish. **Leaves** alternate, simple, fleshy; petiole up to 9 cm long; blade cordate or sometimes ovate to broadly elliptic, 3–15 × 2.5–12 cm, base cordate to acuminate or obtuse, apex usually acute or somewhat acuminate or obtuse, dark green or purplish. **Inflorescence** an unbranched (sometimes with few branches) spike 1–20 cm long, hanging, with long peduncle; bracteoles distinct, ovate to triangular. **Flowers** bisexual, sessile, unscented, cleistogamous or sometimes chasmogamous, 5-merous. **Sepals** ovate to elliptic, ± erect, connate at base or up to ½ of their length, 3.5–5.5 × 2–2.5 mm, up to 7.5 mm long when fruiting, white to reddish at anthesis, purple to black in fruit, thick and juicy. **Petals** ovate to elliptic, ± erect, connate at base or up to ⅓–⅔ of their length, 3.5–5.5 × 1.5–2.5 mm at anthesis, up to 7.5 mm long when fruiting, white to reddish at anthesis, purple to black in fruit, very thick and juicy. **Stamens** 5, opposite petals; anthers pale. **Styles** 3 or 1 that is 3-partite to the base or almost so. Perianth persistent, fleshy, urceolate, tightly enveloping the fruit. **Fruit** a subglobose pseudo-berry, entire structure up to 7.5 × 10 mm, purplish black, containing a violet juice, 1-seeded. **Distribution:** SA. (Fig. 79).

References: Abukutsa-Onyango (2004), Eriksson (2007).

The native distribution of *Basella alba* is unknown though some consider it a native

of southern Asia (Abukutsa-Onyango, 2004), while others feel it is indigenous to Africa (Verdcourt, 1968). The plant is commonly grown as an ornamental (Fig. 80) and leafy vegetable throughout the tropics and subtropics which has lead to widespread naturalization following escape (Eriksson, 2007).



Fig. 79. Distribution map of *Basella alba* L.

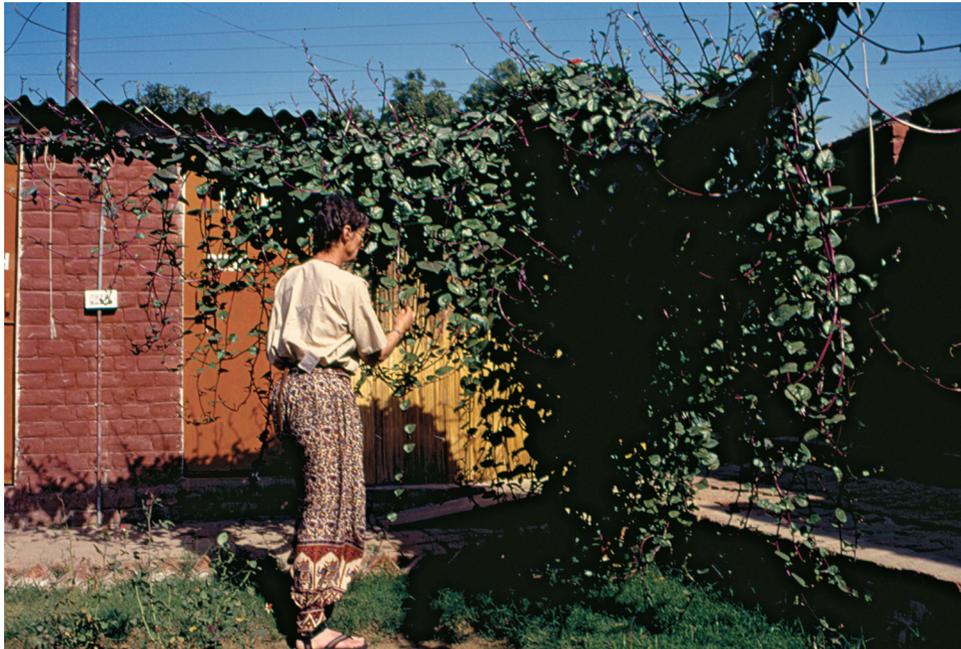


Fig. 80. *Basella alba* L. grown as an ornamental in India. (Picture by Stefan Nesper)

Apart from it being grown as a vegetable, *Basella alba* fruits (Fig. 81) have been used for dyeing, as ink and cosmetics and for colouring foods (Abukutsa-Onyango, 2004). While no medicinal use for the species is recorded from southern Africa, a number of medicinal applications have been reported from elsewhere in Africa (Neuwinger, 2000; Abukutsa-Onyango, 2004). These include treatment for constipation, conjunctivitis, snake bite and headaches, to name but a few (Neuwinger, 2000). Red forms of Malabar spinach are planted as ornamentals, and have become popular in Europe and North America as pot plants (Abukutsa-Onyango, 2004).



Fig. 81. Fruits of *Basella alba* L. (Picture by Stefan Nesper)

BEGONIACEAE C.Agardh.

(Begonia family; *Begoniafamilie*)

by

N.R. Crouch

Herbs or undershrubs, mostly fleshy, generally erect, sometimes creeping or climbing by means of adventitious roots, or acaulescent with a rhizome or tuber. **Leaves** alternate and spiralled, rarely distichous or subradical, petiolate, generally asymmetrical, digitately nerved, margins entire, toothed, lobed or dissected, sometimes peltate; stipules 2, conspicuous, persistent or caducous. **Inflorescences** axillary, cymose, bracteate, often long-pedunculate. **Flowers** unisexual but plants monoecious, regular or irregular, showy. **Male flowers**: tepals usually 2 or 4, rarely many or 0, petaloid; stamens numerous, filaments free or connate; anthers petaloid, 2-locular, opening with longitudinal slits or apical pores; staminodes 0 or rarely represented by glands. **Female flowers**: ovary inferior or rarely half-inferior, rarely 1-, 2-, or 5-locular, usually 3-locular and 3-winged or angled, ovules numerous on projecting simple or lobed axile placentas; styles (2)3(-5), free or connate at base, usually 2-fid, stigmas entire or branched, often twisted, papillose. **Fruit** usually a 3-winged or 3-angled loculicidal capsule, rarely a berry. **Seeds** numerous, minute, testa reticulate, endosperm scanty or absent, embryo straight.

References: Hilliard (1976), Bredenkamp (2000), Egli (2002b).

The Begoniaceae consists of the monotypic *Hillebrandia* Oliv. from Hawaii and *Begonia* L., one of the largest genera of flowering plants, estimated variously to have roughly 1 400 (Smith *et al.*, 1986) or as many as 1 600 species (Sands, 2001), which are distributed mainly throughout the world's tropical forests. Some authorities also recognise the genus *Symbegonia* Warburg as a small genus of 10 species endemic to New Guinea (Tebbitt, 1997). *Begonia* is comprised of mesophytic to somewhat succulent herbs or subshrubs and sometimes even climbers, with five representatives indigenous to the *Flora of Southern Africa* region (Hilliard, 1976). In this region they extend farther into the temperate zone than any other members of the genus, with the possible exception of some Chinese taxa (McLellan *et al.*, 2009). Well over 200 begonias have been introduced to horticulture where they are variably employed as conservatory, window-garden and bedding subjects. Many are grown for their attractively marked foliage, others for their showy blooms, with many of the latter being treated as single pot subjects, although a few are used for bedding. More than ten thousand cultivars and hybrids have been developed (Tebbitt, 1997), including a range of hybrid tuberous pot-plant forms with double and triple blooms that display an enormous spectrum of bright colours.

Although many *Begonia* species possess stems that are succulent, or otherwise simply termed fleshy, they are essentially plants of mesic and sometimes very damp habitats, and so would suffer under conditions of drought stress, being poorly adapted to xeric conditions. Both species dealt with in the current account have succulent stems. Under drought conditions *Begonia hirtella* Link retires to seed until conditions become more mesic, whereas *B. cucullata* Willd. survives by virtue

of both seed and its persistent stolons. Only two *Begonia* species are naturalised in southern Africa. Both taxa fit into the Semperflorens category, an artificial rather than natural system of classification for the genus, which groups species in terms of cultivation requirements and appearance.

***Begonia* L.**

Caulescent or acaulescent herbs or undershrubs with succulent stems and leaves, generally erect, sometimes creeping or climbing, sometimes with rhizomes or tubers; stems aerial, often swollen and conspicuously jointed. **Leaves** alternate, rarely subradical, petiolate, usually asymmetrical, entire, lobed or partite, irregularly toothed, green or sometimes richly multicoloured or spotted. Small axillary bulbs sometimes present. **Male flowers**: tepals 2 or 4, rarely many or 0, petaloid; stamens numerous, filaments free or connate at the base. **Female flowers**: tepals often 5 or 6, sometimes 4, petaloid; ovary usually 3-, rarely 2-, 4- or 5-locular; ovules numerous, placentas axile, projecting, simple or lobed; styles usually as many as the loculi, free or connate at the base, 2-fid; stigmas entire or branched, often twisted, papillose. **Fruit** usually a capsule, 3-winged or 3-angled, rarely terete or 4-angled, or a berry. **Seeds** numerous, minute, without endosperm.

References: Hilliard (1976), Tebbitt (1997).

As only five native species occur in southern Africa (*Begonia dregei* Otto & A.Dietr., *B. geranioides* Hook.f., *B. homonyma* Steud., *B. sonderiana* Irmsch. and *B. sutherlandii* Hook.f.), both locally naturalised and indigenous species are included in the following key [adapted from Hilliard (1976)]:

- | | | |
|-----|--|--------------------------------------|
| 1. | Placentas bilamellate (appearing bifurcate in transverse section) | 2 |
| 1'. | Placentas entire | 4 |
| 2. | Stems hairy when young, leaf margin toothed but not, or scarcely, lobed | 2. <i>Begonia hirtella</i> |
| 2'. | Stems glabrous when young; leaf margin lobed or not | 3 |
| 3. | Leaf flat, margin lobed | (<i>Begonia sonderiana</i>) |
| 3'. | Leaf hooded (cucullate) due to slightly inrolled base, margin not lobed | 1. <i>Begonia cucullata</i> |
| 4. | Leaves nearly symmetrical, suborbicular, nearly all arising from the stem base | (<i>Begonia geranioides</i>) |
| 4'. | Leaves mostly asymmetrical, arising along the aerial stem | 5 |
| 5. | Flowers dark yellow, orange or orange-red, male tepals generally four | (<i>Begonia sutherlandii</i>) |
| 5'. | Flowers white or pink, male tepals usually two | 6 |
| 6. | Primary leaves up to 13 × 7 cm, seldom less than 7 × 3 cm, caudex up to 25 cm diameter | (<i>Begonia homonyma</i>) |
| 6'. | Primary leaves up to 8 × 3.5 cm, usually 5 × 2 cm or less, caudex up to 8 cm diameter | (<i>Begonia dregei</i>) |

1. *Begonia cucullata* Willd.

In: *Species plantarum* 4(1): 414 (1805) var. *cucullata*.

=*Begonia cucullata* Willd. var. *hookeri* (A.DC.) L.B.Sm. & B.G.Schub.

=*Begonia nervosa* Humboldt

=*Begonia semperflorens* Link & Otto

Common names: clubed begonia, wax begonia (English).

Tuberous, stoloniferous, perennial herb; stems erect or ascending, glabrous, 10–100 cm tall. **Leaves** with petiole up to 2.5 cm long; blade slightly asymmetric, broadly ovate, up to 8 × 7 cm, base truncate and inrolled, obtuse, scalloped to sharply toothed (crenate-serrate), ciliate, palminerved, glossy, fleshy; stipules oblong, obtuse, 2–3 cm long, persistent, margins denticulate. **Inflorescence** an axillary, few- to many-flowered cyme, peduncle 3–5 cm long, pedicels slender; bracts persistent, ovate, 5 mm long, serrulate. **Male flowers:** tepals 4, outer pair suborbicular to reniform, 8–13 mm long, inner pair smaller and narrowly obovate, white or pink; stamens free, numerous; filaments short; anthers linear. **Female flowers:** bracteoles deciduous, elliptic to almost spatulate, 3.5–4 mm long, margin ciliate; tepals 4–5, obovate, 6–9 mm long, white or pink; ovary 3-locular, placentas axile, bifid; styles 3, partite; stigmas linear, spiral, continuous. **Fruit** a capsule, 24–30 mm long, unequally 3-winged, the largest wing triangular, subacute, wings acute in the typical variety; placentas split, appearing bifurcate in transverse section. **Seeds** numerous, minute. **Distribution:** SA. (Fig. 82).

References: Golding (1982), Tebbitt (1997), PIER (2010).

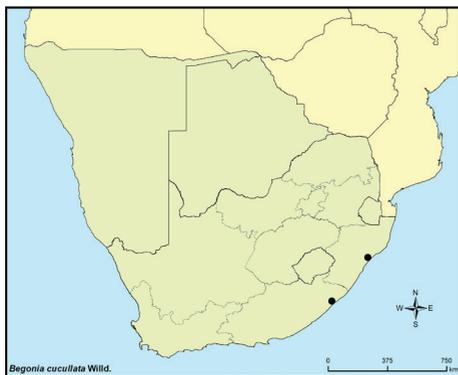


Fig. 82. Distribution map of *Begonia cucullata* Willd.

This species has in the past been confused in herbaria with the indigenous *Begonia homonyma* but this last mentioned species can be readily distinguished on account of its non-bilamellate ovary, and its large caudex (see also key above) (Fig. 83). Additionally, *B. homonyma* leaves are not cucullate or hooded as are those of this invader. Further distinguishing vein and leaf shape characters (Fig. 84) are provided by McLellan *et al.* (1996). At sites such as that on the Mzimvubu River on the Transkei coast these two species may be found co-occurring, the invasive species spreading by seeds dispersed from brown, 3-winged fruit (Fig. 85).



Fig. 83. *Begonia cucullata* Willd. lacks a large caudex. (Picture by Neil R. Crouch)



Fig. 84 . *Begonia cucullata* Willd. – A. Leaf venation; B. Cucullate leaf shape
(Pictures by Neil R. Crouch)



Fig. 85. Winged capsules of *Begonia cucullata* Willd. (Picture by Neil R. Crouch)

Begonia cucullata is regionally a potential emerging invader, which due to its high seed set and persistent and stoloniferous rootstock has the potential to multiply rapidly under suitable conditions. Elsewhere it has been recognised as control-worthy when noted to have escaped from cultivation, such as in Australia (Randall, 2007) and the USA (Florida Invasive Plant Education Initiative, 2010).

This species, native to Brazil, Peru, Argentina, Paraguay and Uruguay, is noteworthy as a founding parent (together with *B. schmidtiana* Regel) of the immensely popular Semperflorens or wax begonias, used primarily as half-hardy bedding plants for landscaping. It is also known to have naturalised in Hawaii (Wagner *et al.*, 2005), La Réunion (MacDonald *et al.*, 1991), Puerto Rico, and both Florida and Georgia in the USA (Florida Invasive Plant Education Initiative, 2010). It has doubtless escaped from cultivation at several sites in South Africa, most prominently at Port St John's (Eastern Cape) (McLellan *et al.*, 1996) and Gilletts near Durban (KwaZulu-Natal). It prefers exposed situations on moist banks (Fig. 86); both pink and white colour forms are invariably found growing together (Fig. 87). *Begonia cucullata* does naturalise though in forest situations under a partially open canopy (McLellan *et al.*, 1996).

In Florida (USA) steps have been taken to limit the impact of this species on the environment, through the use of cultural, mechanical and chemical control measures. Authorities in that state have recommended that this species - likely the most widely known *Begonia* in cultivation - be removed from the landscape and not replanted (Florida Invasive Plant Education Initiative, 2010). A management plan for this species in Florida is available as a downloadable PDF (<http://plants.ifas.ufl.edu/node/65>).

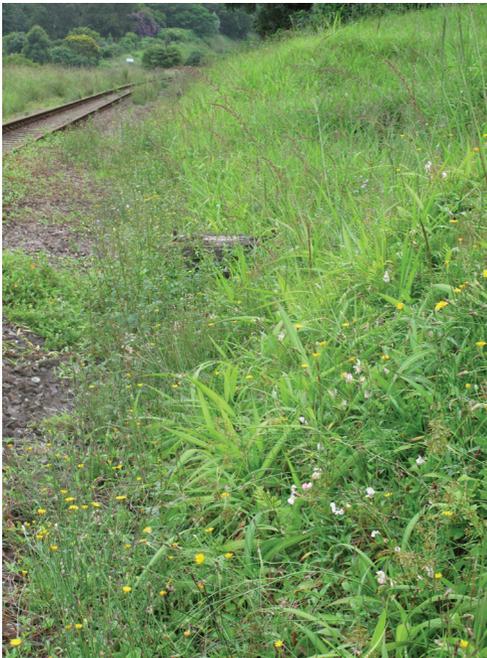


Fig. 86. *Begonia cucullata* Willd. typically inhabits moist banks. (Picture by Neil R. Crouch)



Fig. 87. *Begonia cucullata* Willd. – A. Pink flowers; B. White flowers.
(Pictures by Neil R. Crouch)

2. *Begonia hirtella* Link

In: *Enum. Hort. Berol.* 2: 396 (1822).

=*Begonia villosa* Lindl.

Common names: bearded begonia, Brazilian begonia (English).

Erect, robust, branched, fibrous-rooted, annual herb; stems several from the base, up to 2 cm diameter, there branched, up to 75 cm tall, green or red-tinged, fleshy, thickly clothed in long coarse, white hairs, becoming glabrous or nearly so. **Leaves** widely spaced; petiole up to 9 cm long, pink, fleshy, villous; blade membranous, obliquely ovate, up to 10 × 8 cm, base shallowly cordate to truncate or nearly so, apex acute, margins irregularly crenate-serrate, not or scarcely lobed, green above, thinly villous, paler below, there hairs nearly confined to the main veins, with a red spot above where petiole joins the blade, palminerved; stipules ovate-lanceolate, c. 1 × 0.5 cm, membranous, apex acuminate, margin fimbriate-ciliate, whitish, eventually deciduous. **Inflorescences** in the upper leaf axils, few-flowered, pendent, in branched cymes; peduncles up to c. 5 cm long, usually shorter than the petiole; bracts persistent. **Male flowers:** tepals 4, outer pair ovate to almost circular, 2–8 × 2–6 mm, inner pair linear-oblong, 1–4 × 0.5–2 mm, white; stamens 10–15, arranged symmetrically, anther connectives projecting. **Female flowers:** bracteoles deciduous, elliptic to almost spatulate, 3.5–4 mm long, margin ciliate; tepals 5, unequal, ovate to ovate-oblong, 2–4 × 1–2 mm, white; ovary ovoid to ellipsoid, 4–8 × 2–5 mm, unequally 3-winged, whitish green, 3-locular, placentas axile, bifid; styles 3, partite; stigmas in a spiraled band. **Fruit** capsular, 3-winged, rounded-oblong to cuneiform in outline, 0.8 cm × c. 2 cm at the broadest part of the wings, placentas split, appearing bifurcate in transverse section. **Seeds** numerous, minute, without endosperm. **Distribution:** SA. (Fig. 88).

References: Hilliard (1976), Wagner *et al.* (1999), Tebbitt (2005).

This species is unlikely to be confused with any other in South Africa, because of its hairy leaves (Fig. 89), hairy petioles (Fig. 90) and the presence of aerial stems (Fig. 91). Although some forms of *Begonia sutherlandii* possess hairy leaves they produce orange rather than white flowers (Fig. 92). Fruit of *B. hirtella* are light brown in colour and unequally 3-winged (Fig. 93). The only other hairy begonia with

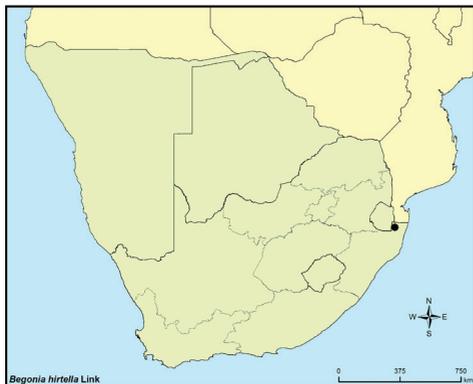


Fig. 88. Distribution map of *Begonia hirtella* Link.

white flowers is *B. geranioides* which is stemless or usually so, normally producing its leaves so close to the base of the stem as to make them appear to come from the root; it is also tuberous, unlike *B. hirtella*. The leaves of *B. geranioides* are additionally suborbicular rather than obliquely ovate.



Fig. 89. Hairy leaves of *Begonia hirtella* Link. (Picture by Neil R. Crouch)



Fig. 90. Hairy petiole of *Begonia hirtella* Link. (Picture by Neil R. Crouch)



Fig. 91. Aerial stem of *Begonia hirtella* Link. (Picture by Neil R. Crouch)



Fig. 92. White flowers of *Begonia hirtella* Link. (Picture by Neil R. Crouch)

This species has not previously been listed as an invasive in South Africa, although it has been recognised as exotic (Bredenkamp, 2006).

The occurrence of *Begonia hirtella* in two Zululand forests remains unexplained and somewhat enigmatic, for although it appears natural when encountered, it has most likely escaped from cultivation. This species, a native of Brazil, Colombia, Peru and some Caribbean islands, has long been cultivated in North America and Europe, despite the fact that it is of little decorative value (Bailey & Bailey, 1976; Hillard, 1976). It has been collected from both Gwalaweni forest in the Lebombo mountains of northern KwaZulu-Natal—well away from sites of amenity horticulture—and in Dlinza forest situated in very close proximity to Eshowe, a town where it may at one time have been cultivated and have escaped. Notably though, Glen (2002) does not list it as a species known to have been grown previously in southern Africa. However, the species is known to have naturalised elsewhere in the world, including Hawaii (Wagner *et al.*, 2005), and Sri Lanka where it is so invasive that it is now the most common *Begonia* species on that island (Tebbitt, 2005). Within the genus *Begonia*, *B. hirtella* belongs to section *Doratometra* from Central and South America: it is in the *Semperflorens* group. Although an annual, this species produces masses of fine seed which has resulted in it becoming a common weed of greenhouses in north temperate regions, as well as a colonist of disturbed habitats throughout the tropics (Tebbitt, 2005). Unusual for a begonia, this species is not only self fertile but also self-pollinating: the male flowers are positioned directly above the female flowers (Fig. 92) so allowing pollen to drop on to the stigmas and for seed to be set (Tebbitt, 2005). Little information is available for its ecological preferences in the two South African forest sites where it has been found so far; elsewhere (Hawaii) where it has invaded it has been recorded locally common in disturbed, wet, shaded sites, especially on moist banks at altitudes of between 450 and 940 m (Wagner *et al.*, 1999).



Fig. 93. Mid-brown and unequally 3-winged fruit of *Begonia hirtella* Link. (Picture by Neil R. Crouch)