

GUIDE TO THE GENERA OF LIANAS AND CLIMBING PLANTS IN THE NEOTROPICS

BASELLACEAE

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Basella alba, photo by P. Acevedo

having odorless leaves.

A family of 4 genera and about 20 species of succulent twining vines with scant secondary growth, with new stems produced from fleshy underground tubers; less often erect or trailing herbs (*Ullucus*). Represented in the Neotropics by 3 genera and 13 species of vines. A family with tropical distribution but most diverse in sub-paramo regions of the Andes in South America.

Diagnostics: Succulent, twining vines, usually a few m long, with clear or mucilaginous exudate; leaves alternate, simple, fleshy, with entire (except *Tournonia*), light colored or reddish margins; flowers small; underground parts tuberous. General appearance similar to Phytolaccaceae but distinguished by being herbaceous and

General Characters

1. **STEMS.** Most species have herbaceous stems which usually are reddish tinged with scant secondary growth, mostly cylindrical. Two species of *Anredera* are known to have stems that can reach several cm in diameter and many m in length. *Anredera baselloides* (Kunth) Baill is reported to reach 2.5 cm in diam at the base of cultivated plants and few meters long; *A. tucumanensis* (Lillo & Hauman) Sperling, can reach 5 cm or more in diam., and up to 12 m in length. In most species, the stems die back, and new stems are produced from a tuberous base. Stems of *Anredera baselloides* (Kunth) Baill. and *Basella rubra* L. (= *B. alba* L.) have been reported as having **successive cambia** that produce **isolated strands of vascular tissue**. Those of *Anredera tucumanensis* contain axial vascular elements in **radial segments** (fig. 1b), marked by the presence of wide vascular rays that separate the axial element of the xylem and phloem into discrete radial portions.
2. **EXUDATES.** **Clear** and odorless, sometimes **mucilaginous**.
3. **CLIMBING MECHANISMS.** All climbing species are **twiners**.
4. **LEAVES.** Alternate, exstipulate, **fleshy** (fig. 1a), with entire (except for *Tournonia*), usually reddish, pinkish, or light green margins, cordiform in many species; petioles more or less elongated without glands.
5. **INFLORESCENCE.** Axillary, short, erect and spicate in *Basella*, long, erect to pendant racemes (sometimes clustered) in *Anredera*, and short dichasial cymes in *Tournonia*.
6. **PEDICELS.** Of variable lengths, flowers sometimes sessile.
7. **FLOWERS.** Actinomorphic, bisexual or unisexual; calyx of 2 distinct sepals; corolla of 5 distinct or basally united petals; stamens 5, the filaments adnate to the base of petals, the anthers opening by longitudinal slits or terminal pores; ovary superior, of 3 united carpels, 1-locular, with solitary basal ovule, the styles 3 or rarely one.
8. **FRUIT.** An utricle, usually fleshy, and covered by a persistent corolla or accrescent calyx; seeds one per fruit.



Figure 1. *Anredera tucumanensis*. **A.** Branch. **B.** Cross section of stem with vascular elements in radial segments. Photos by P. Acevedo.



Figure 2. A. Cluster of aerial bulbils in nodal area in *Anredera cordifolia* (Ten.) Steenis. B. *Anredera vesicaria*, habit. Photos by P. Acevedo.

USES

The tubers of *Anredera* have been used in traditional medicine for the cure of various ailments. *Basella alba* is widely cultivated in the tropics for its edible, spinach-like leaves.

KEY TO THE GENERA

1. Leaves with glandular-dentate margins; inflorescences of compound dichasial cymes;
highlands of Colombia and Ecuador *Tournonia*
1. Leaves with entire margins; inflorescences spicate or racemose.....2
2. Inflorescence of solitary or clustered racemes; corolla with petals connate only at the base,
neither accrescent nor fleshy; stamens inserted at the base of the corolla; Neotropics
..... *Anredera*
2. Inflorescence a short, erect spike; corolla urceolate, tubular, 5-lobed, accrescent, and fleshy,
surrounding the fruit; stamens inserted on the upper portion of the corolla tube; Neotropics
..... *Basella*

GENERIC DESCRIPTIONS

ANREDERA Jussieu, Gen. Pl. 84. 1789.



A. cordifolia; photo by Sheldon Navie (Weeds of Australia)

Herbaceous twining vines, few m long but up to 10 m in *A. vesicaria* (Lam.) Gaertn., Stems usually fleshy, with scant secondary growth but reaching 2–2.5 cm in diam. in *A. baselloides* and *A. vesicaria*; *A. baselloides* known to produce successive cambia that generate isolated strands of vascular tissue. Leaves alternate, slightly

succulent, simple, with entire, colored margins, petiolate. Clusters of aerial bulbils sometimes produced in nodal area (Fig. 2a). Inflorescences axillary, simple or clustered racemes. Flowers actinomorphic, bisexual or functionally unisexual, in pendulous, axillary, simple or clustered racemes. Calyx of 2 free sepals, much shorter than the corolla, united to the petals at the base. Corolla not accrescent, 5 white or cream petals connate at the base. Stamens 5; filaments free or connate and united to the petals; anthers oblong, dehiscent by longitudinal sutures. Ovary superior, of 3 carpels; styles 3, free or connate at the base, as long as the ovary. Fruit a utricle, partly or fully enclosed by a persistent dry perianth.

Distinctive features: Plants fleshy with tuberous base; stems, herbaceous, twining, and usually reddish; leaves with entire, reddish or light green margins; aerial bulbils produced in clusters at the nodes; inflorescence a raceme.

Distribution: A genus of twining herbaceous vines with 12 species native to continental tropical America and likely introduced in the West Indies where it has become invasive on some of the islands (Fig. 2b).

BASELLA Linnaeus, Sp. Pl. 272. 1753.



Basella alba, photo by P. Acevedo

Herbaceous, succulent, twining vines, decumbent or creeping herbs, with thick, fibrous or tuberous roots. Stems fleshy much branched. Leaves alternate, succulent, simple, entire, and petiolate. Inflorescence axillary, simple or branched spikes. Flowers actinomorphic, bisexual white or pinkish tinged, small. Calyx of 2 white or pale green sepals, free to the base, much

shorter than the corolla, united to the petals at the base. Corolla tubular, urceolate, 5-lobed, succulent. Stamens 5, with short filaments, inserted on the upper portion of the corolla tube; anthers dehiscent by longitudinal sutures. Ovary superior, globose or pyriform, of 3 carpels, uniovulate; styles 3, free to the base. Fruit a utricle, partly to completely covered by the persistent, accrescent, sometimes fleshy corolla.

Distinctive features: Plants fleshy, mucilaginous, with herbaceous, twining stems; leaves with entire and light green margins; spikes usually erect and short.

Distribution: A genus of twining vines with 5 species native to Africa or Madagascar. *Basella alba* is widely cultivated in the neotropics and is known to be naturalized in Panama and Brazil.

TOURNONIA Moquin-Tandon in Candolle, Prodr. 13(2): 225. 1849.

Herbaceous, succulent, twining vines much branched from a thickened base. Leaves alternate, succulent, simple, cordiform, with glandular-dentate margins, petiolate. Inflorescence a short, axillary dichasium. Flowers actinomorphic, bisexual, greenish, small. Calyx of 2 pale green sepals, free to the base. Corolla of 5 greenish petals connate at the base. Stamens 5, connate and adnate to the petals at base; anthers basifixed, dehiscent by longitudinal sutures. Ovary superior, globose, obscurely 6-ridged, 3-carpellate; styles 3, free to the base. Fruit a utricle, partly covered by the persistent perianth.

Distinctive features: Plants fleshy, mucilaginous, with herbaceous, twining stems; leaves cordiform with glandular-dentate margins; inflorescence a dichasium. *Tournonia* superficially resembles the genus *Cissus* (Vitaceae), but it is easily distinguished by the lack of tendrils and stipules.

Distribution: A single species distributed in sub-paramos and scrubs of the Andean valleys from southern Colombia to northern Ecuador, at elevations of 2,500 to 3,600 m.

RELEVANT LITERATURE

Carlquist, S. 1999. Wood, stem, and root anatomy of Basellaceae with relation to habit, systematics, and cambial variants. *Flora* 194: 1-12.

Sperling, C. R. 1987. Systematics of the Basellaceae. Unpublished Ph.D. dissertation. Harvard University, Cambridge, Massachusetts.