BASELLACEAE (C. G. G. J. van Steenis, Leyden)

Perennial, glabrous, herbaceous vines, twining to the right, often with a rhizome or tuberous roots. Leaves spiral, sessile or petioled, entire, pinnervened, often rather fleshy, exstipulate. Flowers bisexual (or unisexual), actinomorphic, in axillary (and/or terminal) spikes, racemes or panicles, each subtended by a small bract. Bracteoles 2 or 4, in the latter case in 2 decussate pairs, below the flower, sometimes accrescent and connate at the base, the upper pair often tepaloid. Perianth segments 5, often coloured, connate at the base in a shorter or longer tube, imbricate, persistent, often accrescent. Stamens 5, epitepalous; filaments inserted on the perianth; anthers 2-celled, dorsifixed, dehiscing lengthwise, rarely (in non-Mal. spp.) with an oblique apical slit. Ovary superior, 1-celled; styles simple or 3-armed, or 3 free styles; ovule 1, basal, campylotropous. Fruit indehiscent, surrounded by the persistent often fleshy-accrescent calyx (and eventually bracteoles). Seed globular; testa membranous; endosperm copious, surrounded by the spirally twisted or semi-circular to horseshoe-shaped embryo.

Distr. Four genera with c. 15 spp., almost confined to the warmer parts of the New World, from Texas and the West Indies to Peru, Uruguay, and the Argentine, some spp. of Basella in E. Africa and Madagascar, in Malaysia cultivated and locally naturalizing.

Notes. Volkens (1893) in the first edition of the 'Pflanzenfamilien' interpreted what has been here called the upper two bracteoles as a calyx and the perianth as a corolla. I agree with Bentham & Hooker (1880), Hutchinson (1926), and Ulbrich (1934) in the second edition of the 'Pflanzenfamilien' in accepting a single perianth (called 'calyx' by H. on account of the epitepalous stamens suggesting apetaly) sustained by one or two pairs of bracteoles.

Bentham & Hooker (Gen. Pl. 3, 1880, 76–77) merged Basellaceae with Chenopodiaceae and some authors have accepted this opinion or referred them to Amaranthaceae. Morot (Bull. Soc. Bot. Fr. 31, 1884, 104–117) found the anatomy distinctly different from that of Chenopodiaceae and accepts them as a distinct family.

Eichler (Blütendiagr. 2, 1878, 125, 128) merged them with Portulacaceae and a close affinity with that family was accepted by Volkens (1893) and Ulbrich (1934) in the 'Pflanzenfamilien'.

KEY TO THE GENERA

1. Flowers sessile, fleshy, hardly open at anthesis. Perianth very fleshy, enclosing the fruit. Filaments erect in bud. Embryo spirally twisted

   1. Basella

1. Flowers (in Mal. spp.) pedicelled, not fleshy, patent at anthesis. Perianth not berry-like. Filaments reflexed in bud. Embryo semi-circular or horseshoe-shaped

   2. Anredera

1. BASELLA

LINNÉ, Sp. Pl. (1753) 272; Gen. Pl. ed. 5 (1754) 133.—Fig. 1.

Succulent rhizomatous herbs. Flowers bisexual, in simple or occasionally branched spikes. Bracts minute, caducous. Bracteoles and urceolate perianth connate, fleshy, accrescent, ovoid, very little opening in anthesis, after flowering very fleshy and enclosing the fruit, forming a pseudoberry. Stamens included, filaments very short, inserted near the top of the corolla-tube, erect in bud; stamens dorsifixed, versatile. Perianth segments short, blunt. Styles 3, stigmas linear. Embryo spiral; cotyledons large, thin.

Distr. About 5 spp., apparently native of tropical Africa and Asia, one sp. in E. Africa, 3 spp. described as endemic in Madagascar (differing by a dry, hard pericarp?), in Malaysia only one species of early introduction.


—Basella RHEEDE, Hort. Mal. 7 (1688) 45, t. 24.

—Gandala ulba et rubra RUMPH. Herb. Amb. 5 (1747) 417, t. 154 f. 2.—B. rubra LINNÉ, Sp. Pl. (1753) 272; BURM. f. Fl. Ind. (1768) 76; LAMK,
Basellaceae (van Steenis)


Winding or creeping, 2–10 m long, up to 1 cm diam. Stems and petioles red (var. rubra), more rarely green (var. alba). Leaves broad-ovate to oblong, base shallow-cordate to acute, apex blunt to acute, somewhat succulent, green or purplish, 2–12 by 1¼–9 cm; petiole 1–3 cm. Spikes incl. the peduncle 3–25 cm; (in Mal. specim.) unbranched. with thick, red or green rachis, flowers initially close together, gradually more spaced. Bracts ovate-triangulare, acute, much shorter than the flower; bracteoles broad-elliptic, blunt, shorter than the bract. Flower with pale base and white, rose or purple, blunt apex, 3–4 mm long. Pseudo-berry depressed-globose, shallow lobed, 4–7 mm high, 5–10 mm wide, shining black, containing a violet juice.

Distr. According to Burkhill probably native in the Old World both in Africa and trop. SE. Asia; in the latter country apparently exhibiting the greatest variability, but exact native country not known with certainty and obviously of ancient introduction in Malaysia and China; at present pantropic.

Ecol. Frequently planted by the people up to c. 500 m (in Africa up to 2500, in the Andes up to 3000 m), locally naturalized in the settled areas, preferably the drier areas, in grass-wildernesses and thickets, in young secondary forest, both under everwet and seasonal climatic conditions, but always scattered and likely to disappear. The cultivated specimens belong mostly to cultigens.

Propagated easily by seed and by cuttings which produce shoots within few weeks; it can be best grown on a low trellis. Van Helten (Teysmannia 1915, 213) gave some indications for its cultivation.

Uses. A plant of many uses. An estimated substitute for spinach or purslane and when boiled mucilaginous, used for food as a pot herb and in leafy vegetable stews. This was with Amaranthus spp. and Talinum triangulare Willd. one of the most valued vegetables grown in war prison camps in Indo-Malaysia. According to W. H. Brown it is a good food containing several vitamins and relatively rich in calcium and iron compounds.

Pulped and bruised leaves are used in India and Malaya to poultice sores. They are also a mild laxative. In the Philippines the roots are employed as a rubefacient. The sap is used to anoint any part of the body affected by acne in order to diminish the irritation produced by that malady.

The harmless colouring substance of the berries
(djingga, J) is generally in use for colouring eatables, jellies, pastry, and preserves. Dried it is sold as powder (ginjitu, S) in W. Java.

Vern. Brède d'Angole, épinard d'Amérique, Fr, Malabar nightshade, Ceylon spinach, E, gëndola (the common name), M, rémajongo, Mal. P., rémbajung, Sum., gandola, g. bodas, g. beureum, S, gëndjërot, gëndulak, gëdrëk, užji-ujii, J, kandula, Md, gëndola, Bali, tatabuve, pottolo, duju numuno, N. Cel., rimutu, Ambon; Philip.ines: lûbäto, common name, grana, Tag., alugbati, Bis., îlai-bëkîr, Iloko, arogbati, Bîk., dundalà, Sulù.

Notes. Several cultigens are known and have been distinguished as different species in former time, but they differ by very minor characters. Bailey still distinguishes the two species B. alba and B. rubra on which LINNAEUS based the genus, the first of which should have relatively narrower leaves besides its white flowers.

Through the rule prescribing that the correct epithet should be the one used by the first author who united the synonyms there is no definite certainty about this name. BAILLON (Hist. Pl. 1888) said that there was one species which he accepted as B. rubra, but GRAHAM united them as B. alba in 1839. According to RHEEDE seeds from Ceylon were successfully grown in 1685 in the Amsterdam Hortus Medicus.

2. ANREDERA


Branched vines with annual shoots from a fleshy rhizome. Leaves slightly fleshy, sessile or petiolate. Racemes or spikes axillary, simple or branched. Bracts persistent or caducous; pedicels (if any) persistent, articulate below the perianth. Apex of the pedicels with two pairs of decussate bracteoles appressed to the perianth; lower pair small, connate and persistent forming a cuplet, or free and caducous; upper pair tepaloid, convex or boat-shaped, often keeled on the back, sometimes narrowly winged, rarely broadly winged. Flowers bisexual (or unisexual). Tépals connate at the base, forming a hollow concealing the ovary, segments patent in anthesis, thin, later ± thickened and enclosing the fruit. Filaments filiform broadened towards the base. Style 1 with 3-lobed stigma or split to various degree into arms, eventually into 3 free styles each with a globular to oblong or club-shaped, papillose stigma; arms sometimes forked, each with a linear stigma. Fruit globose, enclosed by the perianth; pericarp fleshy or pergamnaceous. Seed lens-shaped.

Distr. About 5–10 spp. in the warmer parts of America, from Mexico to Peru, the Argentine and Uruguay, also in the Galapagos Isl. (Native).

Notes. As BAILLON rightly remarked (Hist. Pl. 9, 1887, 148) Boussingaultia in the strict sense differs from the monotypic Anred era only by the conspicuously winged two upper bracteoles. This winged structure is a matter of degree, however, as KUNTH described them in the type species of Boussingaultia as 'carinatae concavae dorso inferne membranaceo-subalatae' and HAUMAN distinguishes (l.c. in clav. p. 358) three other species with the same character. It seems therefore unavoidable to merge the two genera into one, Anred era having priority.

In subdividing Anred era I assume it is not advisable to use the style-character as is done by VOLKENS and HAUMAN in Boussingaultia; I have dissected flowers from many specimens of one species and have found the pistil variable as to length of style, length of style-arms, and shape of stigmas, as demonstrated in fig. 2, even in one specimen. I think a fitting character can be found in the nature of the lower pair of bracteoles:

1. Sect. Anred era. Lower bracteoles free, caducous. Type species: A. scandens (L.) MOQ. Syn.: sect. Moquiniiella HAUMAN l.c. 355. Other species belonging here e.g. A. leptostachys (MOQ.) STEEN. comb. nov. (Boussingaultia leptostachys MOQ. in DC. Prod. 13, 2, 1849, 229), fig. 2k. Both species dry light green in the herbarium unlike those I have seen of the following section.

2. Sect. Tandonia (MOQ.) VOLK. in E. & P. Pfl. Fam. 3, 1a (1891) 128. Lower bracteoles connate at the base forming a persistent cuplet on top of the pedicel. Type species: A. baselloides (H.B.K.) BAII.. Syn.: Tandonia MOQ. l.c. 226. Other species e.g. A. cordifolia (TENORE) STEEN.
As a revision of the genus falls without the scope of my task I have intentionally refrained from making other transfers than the above, which I accept as good species. A new key to the species will have to be framed as that of HAUMAN (p. 358) is unsatisfactory, B. gracilis being placed in the wrong section and B. baselloides belonging close to B. ramosa.

KEY TO THE SPECIES

1. Upper bracteoles flattened in flower, orbicular to broad-elliptic, not keeled . . . . . 1. A. cordifolia
1. Upper bracteoles boat-shaped with a conspicuously winged keel . . . . . . . 2. A. scandens

1. Anredera cordifolia (TENORE) STEEN. comb. nov.—Boussingaultia cordifolia TENORE, Ann. Sc. Nat. III, 19 (1853) 355, non B. cordifolia (MOQ.) VOLK. 1893, quae est B. volkensii ULBR.; MAC-

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Fig. 2. Anredera cordifolia (TENORE) STEEN. a. Habit, × 2/3, b. cuplet on top of pedicel, formed by conn at lower pair of bracteoles, c. bud, d. flower, d'. perianth and stamens from inside, e–j. variation in pistil. —A. lepistachys (MOQ.) STEEN. k. pistil.—A. baselloides (H.B.K.) BAII. l. bud (perianth surrounded by 2 boat-shaped bracteoles with narrowly winged keel and pedicel with apical cuplet of lower pair of bracteoles), m. pistil.—A. scandens (L.) MOQ. n. flower, two winged upper bracteoles (detached) surrounding the perianth (a. from Bot. Mag. t. 3620, b–c. BACKER 36502, d–d'. from J. Bot. 2, t. 18, e–h BACKER 36502, f. GLAZIOU 8008, g. HERZOG 2016, h. GAUDICHAUD 359, i. BONPLAND 534, j. BOOM 20485, k. SINTENIS 2361, l–m. coll. HUMBOLDT & BONPLAND 3390, n. after VOLKENS).
Flora Malesiana


Annual shoots up to 6 m; rhizome thick and hardy. Leaves short-petioled, ovate, subcordate, acute or blunt, thin-fleshy, 1-11 by 3'/2-8 cm, producing small axillary tubercles (Bailey). Racemes simple or split into 2-4 branches with a thin, rich-flowered rachis, incl. the peduncle 4-30 cm. Bracts narrow, at most as long as the pedicels, persistent. Pedicels 1'/2-2 mm, receptacular tip cup-shaped by 2 persistent, broad-triangular, acute, hyaline lower bracteoles. Upper pair of bracteoles greenish-white, shorter than the perianth, convex in bud, later flattening, broad-elliptic to suborbicular, c. 1'/2-2 by 1-1'/2 mm. Perianth fragrant, white, nigrigate, patent in anthesis, c. 3'/2-6 mm diam., segments ovate-oblong to elliptic, blunt, 1'/2-3 by 1-2 mm, hardly longer than the stamens and pistil. Stamens white, filaments in bud sharply reflexed at the apex, in anthesis spreading. Style white, but split to various degree into 3 stigmatic arms, each with 1 (rarely 2) club-shaped or broad-elliptic stigmas. Fruit unknown.

Distr. Native of tropical S. America, introduced as an ornamental plant in many countries, in Malaysia in the plains: Java.

Ecol. According to Bailey the underground parts are hardy. No fruit has ever been found and it can be propagated vegetatively by small tubercles found in the axils of the leaves. In Guatemala reported up to 2300 m.

Vern. Madeira vine, mignonette vine, Am.

Notes. Specimens from Java agree in detail with Hooker's plate and that of Baillon; there is no reason to believe that Hooker's plate is erroneous, as suggested by Hauman (loc. p. 350). Cf. fig. 2 l-m.

This species represents, as Hauman has rightly remarked, the commonly cultivated plant which has been generally confused with B. baselloides H.B.K. Nov. Gen. Sp. 7 (1825) 196, t. 645bis (type: coll. Humboldt & Bonpland 3390, P).

For this reason Tenore described it as a new species which apparently contains the oldest epithet.

From the Paris Herbarium I could study the type of B. baselloides which I found to agree in all details with Kunth's plate: the boat-shaped upper bracteoles bear a narrow wing on the lower keel-halves and they slightly exceed the tepals in length. The flowers in the type appear to me female with small barren anthers.

Originally the plant described by Hooker and that by Miers appeared to differ in the pistil but the latter's structure is rather variable as is shown in fig. 2 e-j.


Stems slender, green or purplish, 1-5 m; with large tuberous roots. Leaves ovate to ovate-oblong, obtuse to short-acute, thin-fleshy, shining, 1'/2-8'/2 by 1-6 cm. Racemes rich-flowered, usually simple or with 2-3 branches, 5-30 cm, erect or hanging with ascending apex, rachis rather strong. Bracts ovate-lanceolate, very acute, 3-5 mm, caducous. Pedicels persistent, 1'/2-2 mm, with thickened apex. Lower pair of bracteoles ovate-triangular, acute, caducous. Upper pair of bracteoles boat-shaped, broadly winged on the back, greenish-white, incl. the wings in anthesis 2-2'/2 mm, accrescent to 3-3'/2 mm, with semi-cordate wing-bases, enclosing the corolla and later the fruit. Perianth greenish-white, 2'/2-2'/2 mm long, thin, hyaline, little opening in anthesis, not accrescent. Styles 3, white, connate at the base. Utricle ovoid to globose. Seed not seen.

Distr. Native of tropical America from Texas to Peru, in Malaysia an early introduction by the Spaniards and thoroughly naturalized previous to 1837, as Blanco notes that it was then common in Parañaque, now common about Manila (Laguna, Cavite, Nueva Ecija, Rizal, Pasay, Batangas), in 1922 imported from Manila to Pasuruan (E. Java) as an ornamental but not yet naturalized; fl. Aug.-Nov.. In Malaysia it does not produce seed.

Ecol. A lowland ornamental which apparently needs a dry season for its maintenance, badly growing in the everwet climate of Bogor; in Guatemala reported between 400 and 1300 m.

Uses. In the Tagalog regions the tuberous roots are used as topicals to hasten ripening of boils.

Vern. Malabató, olibato, Tag.

Notes. Linnaeus added a number of early references to his description of Polygonum scandens which belong in part to a Polygonum; the species was typified by Fawcett & Rendle with the type in the Linnean Herbarium.