

Amaranthaceae

Annual or perennial herbs or shrubs, rarely trees or climbers; **L** simple, opposite or alternate, entire, without stipules; **Inf** spikes or head-like or axillary dichasial cymes, or **Fl** solitary; **Bra** and bracteoles often bristly, sometimes enlarged and colourful; **Fl** bisexual (rarely unisexual); **Per** segments (2-) 3 - 5 (rarely 0), usually dry and membranous, usually united basally, imbricate; **St** 1 - 5, opposite **Per** segments; **Fil** usually basally united to form a cup or tube, rarely completely free; **Anth** 1- to 2-theous; staminodes usually present, variable; **Ov** superior, 1-locular and usually with a single ovule; **Fr** membranous utricles or rarely berries, breaking up irregularly or circumscissile; **Se** variable, embryo annular and surrounding the copious endosperm.

Distribution: Cosmopolitan but concentrated in tropical and subtropical regions.

The family counts with some 70 genera and 750 - 900 species and is closely related to the *Chenopodiaceae*. It includes popular garden plants (e.g. *Celosia cristata*, "Cockscomb") and some species are used as vegetables (e.g. *Amaranthus hybridus*, leaves used as spinach) or pot herbs. Others are troublesome weeds. The monotypic genus *Arthroaerva* (Subfamily *Amaranthoideae*) furnishes the only succulent of the family.

[E. van Jaarsveld]

ARTHRAERVA

E. van Jaarsveld

Arthroaerva (Kuntze) Schinz (in Engler & Prantl (eds.), Nat. Pfl.-fam. [ed. 1], III(1a): 109, 1893). **T:** *Aerva leubnitziae* Kuntze. – **Lit:** Schinz (1934: 50). **D:** Namibia. **Etym:** Gr. 'arthron', joint; and for the genus *Aerva* (*Amaranthaceae*); for the jointed branches.

≡ *Aerva* Sect. *Arthroaerva* Kuntze (1886)

Branched shrublets to 25 cm tall; **Br** articulate, succulent, becoming somewhat woody and grey at the base, to 6 mm Ø, longitudinally striate; **Int** 0.6 - 2 cm; **L** opposite, **Sc**-like, triangular-ovate, to 4 mm; **Inf** small, dense, terminal, woolly spikes to 1.5 cm; **Fl** bisexual; **Per** segments 5, acuminate, scarious, silky; **Fil** 5, with short interposed staminodes; **Anth** 2-theous, basally divergent; **Ov** with a single ovule on a basal funicle; **Sty** linear; **Sti** capitate; **Se** oblong, 2 × 1 mm.

There is some argument about the correct spelling of the generic name and Mabberley (1997) is followed here. The genus is monotypic.

A. leubnitziae (Kuntze) Schinz (in Engler & Prantl (eds.), Nat. Pfl.-fam. [ed. 1], III(1a): 110, fig. 63, 1893). **T:** Namibia (*Pechuel-Loesch* s.n. [B?]). –

D: C-W Namibia; coastal Namib desert. **I:** Schinz (1934: 50).

≡ *Aerva leubnitziae* Kuntze (1886) ≡ *Uretia leubnitziae* (Kuntze) Kuntze (1891) (*incorrect name*, Art. 11.3); **incl.** *Aerva desertorum* Engler (1889).

Description as for the genus.

Anacardiaceae

Trees, shrubs or lianas, mostly with aromatic resin or latex (frequently toxic), mostly monoecious, rarely dioecious or with bisexual flowers; **L** mostly spiral, pinnate or 3-lobed, rarely entire, stipules absent or very reduced; **Inf** terminal or lateral, paniculate or reduced to 1-flowered; **Fl** mostly unisexual (rarely bisexual), 5-merous; **Cal** and **Cl** rarely absent; **St** 10, 5, rarely more or only 1, rarely united basally; **Fl** centre commonly with a ring-like or lobed **Nec**; **Ov** mostly superior, with 3 - 5 - 12 united **Ca**, mostly unilocular, with 1 anatropous ovule per locule; **Fr** mostly drupes with resinous mesocarp.

Distribution: Tropics and subtropics worldwide, Mediterranean, N America.

A large family (\pm 75 genera, over 800 species) with predominantly tropical-subtropical occurrence as well as many species in N America. Important crop plants of the family are pistachio (*Pistacia*), mango (*Mangifera*) and cashew nut (*Anacardium*); numerous species of sumac (*Rhus*) contain strong allergenic poisons while others furnish tannins and lacquers.

The family can be divided into several tribes on the basis of the numbers of carpels and the morphology of the ovary. Little-pronounced succulence is found (as pachycaul trunks) among few taxa; apart from those treated below, seedling plants of species of *Cyrtocarpa* and *Lansea* are also occasionally found in cultivation. The family is closely related to the *Burseraceae*, and distinguishing the two is difficult (e.g. on the basis of the arillate stones of *Burseraceae*).

Key to genera with succulents

- 1 **Fl** solitary or in small fascicles; **Fr** fleshy drupes: **Operculicarya**
 – **Fl** in many-flowered panicles; **Fr** dry: **Pachycormus**

[U. Eggli]

OPERCULICARYA

U. Eggli

Operculicarya Perrier (Mém. Mus. Nation. Hist. Nat. 18(7): 248, 1944). **T:** *Operculicarya decaryi* H. Perrier [Lectotype, designated by Capuron, Adansonia, ser. 2, 2(2): 270-283, 1962.]. – **Lit:** Eggli (1995). **D:** Madagascar. **Etym:** Lat. 'operculum' small lid; and Gr. 'karya', nut tree; referring to the operculate nut-like seeds.

Gnarled dioecious shrubs or small trees with regularly or irregularly thickened trunks with \pm tubercular-bulbous bark; young twigs slender, straight

or zigzag, with long **Int** and **Ros**-bearing short shoots, drought-deciduous; **L** alternate or in **Ros**, glabrous or hairy, imparipinnate with 3 - 20 pairs of leaflets, rachis \pm to strongly winged; **male Fl** solitary or in small fascicles on short shoots, 5-merous; **St** 10, **Fl** basally broadened and thickened, **Nec** irregularly lobed to ring-like, pistillodium small to large; **female Fl** solitary on short shoots, similar to **male Fl** but with sterile **Anth**; **Ov** globose to oblong, **Sty** 5, peripheral; **Fr** fleshy drupes, sessile or shortly stalked with persistent **Cal**, stone unilocular, mostly with only 1 oblong-elliptic operculum.

The 5 species of *Operculicarya* have a wide but scattered distribution in Madagascar (excepting the moist forests of the E coast). Only 1 species is unequivocally succulent, but since all are \pm xerophytic and show thickened trunks, all are treated below. *Operculicarya* is separated from the closely related *Poupartia* through the smaller leaves with a \pm winged rachis and the smaller inflorescences or solitary flowers.

O. borealis Eggli (Bull. Mus. Nation. Hist. Nat., Sect. B, Adansonia 17(3-4): 152-153, ill. (p. 155), 1995). **T:** Madagascar, Ouest-Nord (*Capuron* 23097SF [P]). – **D:** N Madagascar (Antsiranana), on sandy soils.

Small trees; trunk and bark unknown; twigs straight, glabrous or slightly hairy; **L** 2.8 - 5 cm with (4-) 5 - 7 pairs of leaflets, leaflets overlapping one another, roundish-ovate, 4 - 8 \times 3 - 4 mm or larger, tip rounded, upper face glabrous and glossy or slightly hairy, lower face densely hairy, with 8 - 12 pairs of veins; rachis a little winged, with scattered bristly **Ha**; **Fl** unknown; **Fr** sessile, \pm globose.

O. decaryi H. Perrier (Mém. Mus. Nation. Hist. Nat. 18(7): 249, 1944). **T:** Madagascar (*Decary* 9305 [P]). – **D:** S and SW Madagascar; xerophyte forests. **Fig. 1a**

Shrubby or trees to 6 (-15 ?) m; trunk parallel-sided, bottle-shaped or conical, to 1 m \varnothing , bark irregularly warty-bumpy, dark grey; twigs glabrous or hairy and glabrescent, \pm straight; **L** 2.5 - 6 cm, with (4-) 5 - 7 (-9) pairs of leaflets, glabrous or with scattered **Ha**, rachis \pm to conspicuously winged; leaflets circular to ovate, 4 - 7 \times 3 - 4 mm, not touching each other, tip rounded, upper face dark green and glossy, lower face paler, with 3 - 4 pairs of veins; **Fl** dark red; **Fr** stalked 5 - 6 mm, globose to drop-shaped.

O. hirsutissima Eggli (Bull. Mus. Nation. Hist. Nat., Sect. B, Adansonia 17(3-4): 154-155, ill., 1995). **T:** Madagascar (*Léandri* 3447 [P]). – **D:** S-C Madagascar (Ihosy); on gneiss.

Trees to 6 m; trunk to 40 cm \varnothing ; bark unknown; twigs glabrous or slightly tomentose, straight; **L** 5.5 - 7 cm, with (9-) 11 - 13 (-14) pairs of leaflets; rachis hardly to broadly winged; leaflets often

asymmetrically arranged, hardly or not overlapping one another, broadly ovate to elliptic, 6 - 9 × 3 - 4.5 mm, tip rounded to truncate, both sides conspicuously greyish-tomentose, lower face with 5 - 10 indistinct pairs of veins; **Fl** colour unknown; **Fr** pendent, stalked 8 - 12 mm, broadly ovoid, without persistent **Cal**.

O. hyphaenoides H. Perrier (Mém. Mus. Nation. Hist. Nat. 18(7): 249, 1944). **T:** Madagascar (*Perrier* 19169 [P]). – **D:** SW Madagascar (Lac Tsimanampetsotsa); on limestone.

Small trees to 1.5 m with several gnarled trunks to 40 cm Ø from a common base, each with a densely branched crown; bark warty-bumpy; twigs glabrous, brownish-grey, ± straight; **L** 2.5 - 6 cm, medium to dark greenish-olive, with (11-) 14 - 18 (-20) pairs of leaflets; rachis hardly to conspicuously winged; leaflets ± 4 × 2 mm, roundish-rectangular with truncate tip, margins revolute, lower face with 5 - 7 pairs of raised veins; **Fl** perhaps dark red; **Fr** pendent, stalked to 18 mm, depressed-globose.

O. pachypus Eggli (Bull. Mus. Nation. Hist. Nat., Sect. B, Adansonia 17(3-4): 155-157, ill., 1995). **T:** Madagascar (*Humbert* 2614 [P]). – **D:** SW Madagascar (near Toliara); on limestone. **I:** Eggli (1994: 136, as *O. sp.*). **Fig. I.b, I.c**

Bonsai-like to 1 m, trunk conical to irregularly pyramidal, narrowing towards apex, to 50 cm Ø with spreading crown; bark irregularly bumpy, silver-grey; twigs glabrous, pale grey to grey-brown, often ± strongly zigzag, tips often spinescent; **L** 1.5 - 3.6 cm with 3 - 4 (-5) pairs of leaflets, glabrous, somewhat coriaceous; leaflets circular to elongate drop-shaped, distant from each other or touching, largest near middle of **L**, 7 - 8 × 4 mm, tip rounded or slightly emarginate, upper face dark green, glossy, lower face paler with 3 - 4 pairs of veins; **Fl** yellowish-green; **Fr** stalked 3 - 4 mm, ± globose, somewhat laterally compressed.

Despite the conspicuously different trunk, this species was until recently identified as *O. decaryi*, e.g. also by Teichman & Hardy (1992).

PACHYCORMUS

U. Eggli

Pachycormus Coville *ex* Standley (CUSNH 23(3): 671, 1923). **T:** *Schinus discolor* Benth. – **Lit:** Humphrey (1991). **D:** Baja California. **Etym:** Gr. 'pachys', thick; and Gr. 'kormos', trunk; for the thick trunk and branches.

Incl. *Veatchia* A. Gray (1884) (*nom. illeg.*, Art. 53.1). **T:** *Veatchia cedrosensis* A. Gray.

Tree-like, 3 - 5 (-10) m, dioecious, drought deciduous; trunk to 1 m Ø, wood soft, with yellowish, reddish, brownish or milky resinous exudate; bark pale ochre, peeling in papery pieces; **Br** massively

thickened, often gnarled and contorted; **L** ± asymmetrically pinnate, 1.5 - 8 × 0.7 - 3 cm overall; **Inf** lax to dense terminal panicles; **Sep** 5; **Pet** 5, elongate-ovate, pale to dark pink, becoming paler during anthesis, drying and persistent; **St** 10; **Ov** unilocular; **Sty** 3 with capitate **Sti**; **Fr** small, dry and bladder-like, shortly tomentose.

The genus has a single species only:

P. discolor (Benth.) Coville *ex* Standley (CUSNH 23(3): 671, 1923). – **I:** Eggli (1994: 137).

Fig. I.d

≡ *Schinus discolor* Benth. (1844) ≡ *Veatchia discolor* (Benth.) T. S. Brandegee (1889); **incl.** *Rhus veatchiana* Kellogg (1863) ≡ *Veatchia discolor* var. *veatchiana* (Kellogg) I. M. Johnston (1924) ≡ *Pachycormus discolor* var. *veatchianus* (Kellogg) Gentry (1949); **incl.** *Veatchia cedrosensis* A. Gray (1885); **incl.** *Bursera pubescens* S. Watson (1889) ≡ *Veatchia discolor* var. *pubescens* (S. Watson) I. M. Johnston (1924) ≡ *Pachycormus discolor* var. *pubescens* (S. Watson) Gentry (1949).

Description as for the genus.

The species is variable and is sometimes divided into 3 varieties on account of leaf and inflorescence characters, but intermediate forms are common. Vernacular names: "Copalquin", "Torote Blanco", "Elephant Tree".

Apiaceae

Plants variable, ranging from annuals, geophytes, herbs to shrubs or trees, usually aromatic and with characteristic scent; **R** often tuberous or thickened storage roots; **Br** herbaceous, often fleshy but not normally succulent; **L** alternate, usually compound (simple, palmatifid, pinnatifid to digitately compound); petiole \pm amplexicaul basally; **Inf** umbellate, simple or compound, rarely reduced to a solitary **Fl**, involucre present or absent, rarely petaloid and the whole umbel a pseudanthium; **Fl** proterandrous, small, actinomorphic or asymmetrical, often marginal **Fl** of an umbel dissimilar from the others; **Cal** tube adnate to **Ov**, truncate or lobed; **Pet** 5, arising from the disc margin; nectary disc expanded, flattened to conical, margin crenate, undulate or entire; **St** 5, alternating with the **Pet**, inflexed in bud; **Anth** 2-theous; **Ov** inferior, (1- to) 2-locular, each locule with a single pendulous ovule; **Sty** 2, free; **Fr** schizocarps with 2 indehiscent mericarps; mericarps variable, usually ribbed, glabrous, spiny or woolly.

Distribution: Worldwide, but esp. common in N temperate regions and on tropical mountains.

The *Apiaceae* (alternative name: *Umbelliferae*) are a well-known large cosmopolitan family of \pm 300 - 400 genera and with more than 2500 species. It is closely related to the *Araliaceae*, and there are good arguments to sink the latter into synonymy. The *Apiaceae* are probably known best for *Daucus carota* (carrot) and *Pastinaca sativa* (parsnip), both important root crops, but contain numerous other important vegetables and spices such as parsley, fennel and dill.

The family is divided into 3 subfamilies and several tribes. Moderate succulence has evolved in a single species of the genus *Steganotaenia* (subfamily *Apioideae*), while *Crithmum* (included by Jacobsen in his *Lexicon*) is at best a halosucculent which is excluded here.

[E. van Jaarsveld]

STEGANOTAENIA

E. van Jaarsveld

Steganotaenia Hochstetter (Flora 27(1), Bes. Beilage 4, 1844). **T:** *Steganotaenia araliacea* Hochstetter. – **Lit:** Burt (1991: 249-250). **D:** Africa. **Etym:** Gr. 'stegano-', covered, roofed (from Gr. 'stege', roof); and Gr. 'taenia', ribbon, band; application obscure.

Shrubs or \pm pachycaul trees to 6 m, all parts carrot-scented; **R** fibrous; **Br** often succulent, yellowish or grey-green with flaking bark; **L** crowded in **Ros** at the **Br** tips, petiolate, pinnate with 2 - 3 pairs of leaflets; **Inf** umbellate, in tight clusters; **Fl** bisex-

ual or male, 5-merous; **Cal** with small teeth; **Pet** obovate with inflexed tips; **male Fl** disc-shaped with rudimentary **Sty**; **bisexual Fl** with slightly concave disc; **St** overtopping the **Pet**; **Ov** obovate with terete **Sty**; **Fr** flattened, cordate.

The genus is endemic to Africa and has 3 species, of which the following has developed somewhat succulent characteristics:

S. araliacea Hochstetter (Flora 27(1), Bes. Beilage 4, 1844). – **D:** SE to NE Africa; savanna, rock outcrops; flowers in winter and spring. **I:** Coates Palgrave (1983: 708, fig. 234).

\equiv *Peucedanum araliaceum* (Hochstetter) Vatke (1876); **incl.** *Peucedanum fraxinifolium* Oliver (1873); **incl.** *Peucedanum araliaceum* var. *petiolulatum* Engler (1894); **incl.** *Peucedanum araliaceum* var. *subintegrioliolatum* Engler (1921); **incl.** *Peucedanum fraxinifolium* var. *galpinii* Burt Davy (1932).

Somewhat pachycaul small sparingly branched deciduous trees to 6 m; **Br** succulent, yellowish, grey-green with flaking bark, to 30 - 40 cm \varnothing ; **L** petiolate, to 31 cm, green, drooping, pinnate with 2 - 3 pairs of leaflets; petiole yellowish, to 12 cm, amplexicaul at the base; petiolules to 3.5 cm; leaflets triangular-lanceolate to lanceolate, 4.5 - 8 \times 1.8 - 3.5 cm, margin serrate, base cuneate to almost truncate, apex acuminate; **Inf** terminal, umbellate, to 7 cm \varnothing ; **Fl** greenish-white, 2 - 3 mm \varnothing , bisexual or male; **Cal** with small teeth; **Fr** in large clusters, creamy-brown with papery wing, flattened, cordate, consisting of 2 mericarps 1.5 \times 1 cm.

With its succulent stem, yellow flaking bark and drooping fresh green carrot-scented leaves, this is a very beautiful garden subject and is becoming commonly cultivated in frost-free regions of RSA. Easily propagated by truncheon or branch cuttings, and locally known as "Carrot Tree" due to its scent. The species has various medical uses: the roots are chewed to relieve sore throats, and the bark is used for alleviating asthma (Coates Palgrave 1983).



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