

- LE THOMAS, A. 1969. Annonacées. *Flore du Gabon* 16: 1–371.
- MAPAURA, A. & TIMBERLAKE, J.R. 2002. Zimbabwe. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 157–182. SABONET, Pretoria.
- MARTINS, E.S. 1994. John Gossweiler. Contribuição da sua obra para o conhecimento da flora angolana. *Garcia de Orta, sér. Botânica* 12(1 & 2): 39–68.
- OLIVER, D. 1865. On four new genera of plants of Western Tropical Africa, belonging to the natural orders Anonaceae, Olacineae, Loganiaceae and Thymelaeaceae; and on a new species of *Paropsia*. *Journal of the Linnean Society, Botany* 8: 158–162.
- OLIVER, D. 1867. On five new genera of West Tropical Africa, belonging to the natural orders Bixineae, Tiliaceae and Anonaceae, with a note upon the genera *Oncoba* and *Mayna*. *Journal of the Linnean Society, Botany* 9: 170–176.
- PAIVA, J.A.R. 1966. Revisão das Annonaceae de Angola. *Memórias da Sociedade Broteriana* 19: 5–128 + Tab. I–XIV.
- PAIVA, J.A.R. 1970. Notes on Annonaceae. 1—*Polyalthia* Blume, a new genus record for the *Flora zambesiaca* area. *Boletim da Sociedade Broteriana* 44: 369–373 + Tabs. I + II.
- PAIVA, J.A.R. 1983–84. Anotações a “Revisão das Annonaceae de Angola”. *Garcia de Orta, sér. Botânica* 6(1–2): 177–186.
- PELLEGRIN, F. 1920. *Letestudoxa*. *Bulletin du Muséum d’Histoire Naturelle Paris* 26: 654.
- RIDLEY, H.N. 1917. *Sphaerocoryne*. *Journal of the Straits branch of the Royal Asiatic Society*. Singapore 75: 8.
- ROBSON, N.K.B. 1960. Annonaceae. *Flora zambesiaca* 1(1): 104–149.
- SAINTE-HILAIRE, A.F.C.P. DE. 1824. *Flora Brasiliae meridionalis*. Belin, Paris.
- SETTEN, A.K. VAN & MAAS, P.J.M. 1990. Studies in Annonaceae. XIV. Index to generic names of Annonaceae. *Taxon* 39: 675–690.
- VERDCOURT, B. 1969. The status of the genus *Polyalthia* Blume (Annonaceae) in Africa. *Adansonia, sér. 2*, 9(1): 87–94.
- VERDCOURT, B. 1971a. Notes on East African Annonaceae. *Kew Bulletin* 25: 1–34.
- VERDCOURT, B. 1971b. *Flora of tropical east Africa*. Annonaceae: 1–131.
- VERDCOURT, B. 1986. New taxa of East African Annonaceae. *Kew Bulletin* 41: 287–297.
- VOLLESEN, K. 1980. A new species of *Polyalthia* (Annonaceae) from Mozambique. *Botaniska Notiser* 133: 403, 404.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Aphloiaceae

(Dilleniidae—Violales)
(Eurosidae I—Malpighiales)

Trees or shrubs; cyanogenic glycosides absent. **Leaves** alternate, simple, narrowly elliptic or oblanceolate, serrated or sometimes incised, petiolate; stipules minute, caducous. **Inflorescences** axillary, few-flowered fascicles or racemes, or flowers solitary. **Flowers** bisexual, regular. **Sepals** 4 or 5(6), fused basally, imbricate, orbicular, concave, somewhat leathery. **Petals** 0. **Disc** and disc glands 0. **Stamens** many, arising outside or towards margin of disc; filaments free, terete, longer than sepals; anthers short, without appendages. **Ovary** superior, 1-locular, with few to several ovules on a single parietal placenta; style short, stigma peltate. **Fruit** a fleshy berry with \pm 6 seeds. **Seeds** obovoid or globose; testa incurved, crustaceous; endosperm thin; embryo incurved, cotyledons ovate.

Genus 1, species 1, polymorphic, E trop. Africa, Madagascar, Mascareignes, sthn trop. Afr.

Bredenkamp, C.L. in Leistner: 305 (2000), under Flacourtiaceae.

Takhtajan: 203 (1997); Chase *et al.*: 174 (2002). See under Flacourtiaceae (in broad sense) for a discussion of the separation of this family from Flacourtiaceae.

Aphloia (DC.) Benn.

Bennett: 192 (1840); Wild: 279 (1960); White: 265 (1962); Wild & Vidigal: 19 (1973); Sleumer: 55 (1975); Killick: 80 (1976); White *et al.*: 266 (2001); Coates Palgrave: 760 (2002); Bingham (Unpublished); Mapaura (Unpublished).

Description as for family.

Monotypic family: *Aphloia theiformis* (Vahl) Benn., sthn trop. Afr.: Zambia; Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- BENNETT, J.J. 1840. *Aphloia*. In: J.J. Bennett & R. Brown. *Plantae javanicae rariores*. Allen, London.
- BINGHAM, M.G. (Unpublished). Preliminary check list of Zambia (August 1999). Unpublished manuscript. SABONET, Pretoria.
- CHASE, M.W., ZMARZTY, S., LLEDÓ, M.D., WURDACK, K.J., SWENSEN, S.M. & FAY, M.F. 2002. When in doubt, put it in Flacourtiaceae: a molecular phylogenetic analysis based on plastid *rbcL* DNA sequences. *Kew Bulletin* 57(1): 141–181.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- KILLICK, D.J.B. 1976. Flacourtiaceae. *Flora of southern Africa* 22: 53–84, 91–92.
- MAPAURA, A. (Unpublished). Check list of the vascular plants of Zimbabwe. Unpublished manuscript. SABONET, Pretoria.
- SLEUMER, H. 1975. *Flora of tropical east Africa*. Flacourtiaceae: 1–68.
- TAKHTAJAN, A. 1997. *Diversity and classification of flowering plants*. Columbia University Press, New York.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press, London.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.
- WILD, H. 1960. Flacourtiaceae (incl. Samydeaceae). *Flora zambesiaca* 1(1): 261–298.
- WILD, H. & VIDIGAL, M.P. 1973. Flacourtiaceae. *Flora de Moçambique* 16: 1–41.

Apiaceae
(**Umbelliferae**)
(Asteridae—Asterales)
(Euasterids II—Apiales)

Van Wyk, B.-E. in Leistner: 62 (2000).

Sthn trop. Afr.: genera 25, species 60.

Key to genera

- 1a Fruit (and to some extent the ovary) with silky to bristly or vesicular hairs, or straight to variously hooked spines:
- 2a Fruit with papillae, tubercles or vesicular hairs:
- 3a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin **Alepidea**
- 3b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:
- 4a Rigid, broom-like undershrubs with few to scale-like stem leaves **Deverra**
- 4b Leafy annual to perennial herbs with leaves often mainly basal:
- 5a Bracts and bracteoles below the umbels conspicuous **Physotrichia**
- 5b Bracts and bracteoles below the umbels absent **Pimpinella**
- 2b Fruit with silky to bristly hairs or straight to variously hooked spines:
- 6a Leaves simple or palmately lobed to palmately compound:
- 7a Bracts and bracteoles below the umbels present; fruit with long, hooked spines **Sanicula**
- 7b Bracts and bracteoles below the umbels absent; fruit with silky to bristly hairs **Pimpinella**
- 6b Leaves pinnate, pinnately lobed or several times divided, sometimes basal leaves simple:
- 8a Fruit with silky to bristly hairs:
- 9a Leaves with strongly developed sheathing base; bracts and bracteoles conspicuous **Diplophium**
- 9b Leaves without prominent sheathing base; bracts and bracteoles absent **Pimpinella**
- 8b Fruit with spines usually tipped with hooked hairs:
- 10a Spines arranged in distinct rows on the secondary ribs:
- 11a Involucral bracts entire **Agrocharis**
- 11b Involucral bracts pinnatisect ***Daucus**
- 10b Spines not in distinct rows:
- 12a Ultimate leaf segment triangular-ovate **Torilis**
- 12b Ultimate leaf segment linear **Angosesele**
- 1b Fruit and ovary glabrous:
- 13a Trees, shrubs or subshrubs with substantial woody caudex; leaves simple, ternate or 1-pinnate:
- 14a Leaves/leaflets entire; one mericarp with one (the central) dorsal rib winged and the other with two (the intermediate) dorsal ribs winged **Heteromorpha**
- 14b Leaflets distinctly toothed, the teeth terminating in fine bristly points; fruit with both mericarps similarly winged **Steganotaenia**
- 13b Annual, biennial or perennial herbs:
- 15a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin **Alepidea**
- 15b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:
- 16a Mericarps strongly dorsoventrally compressed (measured without wings twice as wide as thick or wider):
- 17a Leaves 1-pinnate with 3–7 pairs of roundish to ± ovate, irregularly incised-toothed leaflets **Heracleum**
- 17b Leaves mostly 2- or more pinnate or -pinnatisect, or 2-ternate, rarely simple:
- 18a Peduncles very slender **Lefebvrea**
- 18b Peduncles relatively stout and stiff:
- 19a Annual herbs; leaves compound-pinnate with filiform ultimate segments; petals bright yellow ***Anethum**
- 19b Perennial, rarely biennial or annual herbs; leaves, if compound-pinnate, with broader ultimate segments; petals white, cream or greenish yellow or purplish:
- 20a Mericarps without wings on the dorsal ribs; petals white, cream or greenish yellow **Peucedanum**
- 20b Mericarps with wings on the 3 dorsal ribs; petals purplish **Pseudoselinum**
- 16b Mericarps not strongly dorsoventrally compressed, less than twice as broad as thick:
- 21a Leaves 1-pinnate:
- 22a Leaflets usually in more than 18 pairs, somewhat coriaceous, overlapping when young **Afrocarum**
- 22b Leaflets in usually fewer than 16 pairs, not leathery, not overlapping when young:
- 23a Leaflets regularly neatly denticulate, each tooth with a cartilaginous white mucro incurved over the base of the next tooth **Sium**
- 23b Leaflets irregularly dentate; mucro on teeth not incurved over the next tooth **Berula**
- 21b Leaves mostly 2- or more pinnate, or 2-ternate, rarely simple:
- 24a Leaves strongly resembling leaves of *Ceratophyllum*: broadly linear to strap-shaped in outline, 3-pinnate with very finely divided ultimate segments **Frommia**
- 24b Leaves broader in outline and often finely divided:

- 25a Calyx teeth obvious, even in fruit ***Coriandrum**
- 25b Calyx teeth obscure or obsolete in fruit:
- 26a Bracts and bracteoles well-developed:
- 27a Ultimate leaf segments linear, entire **Aframmi**
- 27b Ultimate leaf segments broader than linear, variously cut or toothed **Conium**
- 26b Bracts and bracteoles absent:
- 28a Many umbels are ± sessile **Apium**
- 28b All umbels pedunculate:
- 29a Glabrous, glaucous herbs with strong aniseed odour; leaves continually dissected into fine, very slender segments.
..... ***Foeniculum**
- 29b Herbs of varying habit and colour, often at least shortly sparsely hairy, with aniseed odour; leaves various but not
dissected in very slender segments throughout **Pimpinella**

Aframmi C.Norman

Norman: 199 (1929); Cannon: 352 (1970); Cannon: 585 (1978); Martins: 63 (1994) as *Aframmi*; Bingham & Smith: 140 (2002).

Biennial or perennial herbs. **Leaves** finely divided. **Flowers** in terminal and lateral umbels with long wiry rays; bracts and bracteoles well-developed; bracts entire or slightly pinnatifid, probably frequently semicaducous. **Calyx**: teeth broadly triangular. **Petals** with inflexed apex, yellowish green. **Disc** with undulate margin. **Styles** short, divergent; stigmatic surfaces slightly clubbed; stylopodium low-conical. **Fruit** ovate to obovate, slightly laterally compressed; ribs well-developed, obtuse; vittae large, 1 in each interval and 2 in commissural surface.

Species 2, Zaire, and sthn trop. Afr. 2, Angola, Zambia.

Afrocarum Rauschert

Rauschert: 555 (1982); Townsend: 69 (1989).

Baumiella H. Wolff; Cannon: 343 (1970); Cannon: 595 (1978); Cannon & Martins: 37 (1981).

Perennial herbs. **Leaves** imbricated when young and bearing spinous cartilaginous teeth. **Flowers** in compound umbels; bracts and bracteoles many and well-developed. **Calyx**: teeth obsolete. **Petals** suborbicular to broadly obcordate, apex emarginated with an inflexed point. **Style** short, stiff, erect, slightly divergent; stigmatic surfaces slightly thickened; stylopodium well-developed, conical with a thickened, undulate margin. **Fruit** ovoid, slightly laterally compressed; ribs filiform but quite distinct. **Fruit**: mericarps pentagonal in section; commissural face flat; vittae 1 in each interval and 2 in commissural face. **Seed** with flat commissural face.

Monotypic genus: *Afrocarum imbricatum* (Schinz) Rauschert, centered in sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique; but also in Zaire and S Tanzania.

Agrocharis Hochst.

Cannon: 572 (1978); Cannon & Martins: 19 (1981); Townsend: 30 (1989).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Alepidea F.Delaroche

Cannon: 567 (1978); Cannon & Martins: 12 (1981); Townsend: 19 (1989); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Anethum** L.

Linnaeus: 263 (1953); Cannon: 353 (1970); Cannon: 607 (1978); Cannon & Martins: 46 (1981); Townsend: 87 (1989).

Robust, rather glabrous annual herbs, with a strong characteristic odour; stem terete, with many fine grooves. **Leaves** 3- or 4-pinnate, ultimate segments narrowly linear to filiform. **Flowers** in terminal, compound umbels, equalled or exceeded by long-peduncled laterals; rays many, up to 40 mm long; bracts and bracteoles 0; partial umbels with up to 35 flowers, but those of small plants may have as few as 6. **Sepals** obsolete. **Petals** yellow with an obvious inturred apex. **Fruit** elliptic, strongly dorsiventrally compressed, with a moderately well-developed marginal wing paler in colour than body of fruit; stylopod low-conical; styles short, clubbed at apex, divergent and shed before fruit matures; dorsal ribs filiform; carpophore 2-cleft to base; vittae well-developed, 1 per interval and 2 in commissural face.

Monotypic genus: **Anethum graveolens* L., the culinary herb Dill, locally escaped from cultivation in Mozambique.

Angoseseli Chiov.

Chiovenda: 38 (1924); Cannon: 344 (1970).

Caucalis in the sense of Hiern: 432 (1898).

Annual herbs dichotomously branched from base. **Leaves** pinnatisect with ultimate segments linear. **Flowers** in leaf-opposed and terminal umbels; bracts and bracteoles narrowly linear. **Calyx**: lobes obsolete or concealed by whitish hairs of densely setose ovary. **Petals** incurved at apex, broadly obovate. **Stamens** exerted; anthers violet. **Fruit** ovoid, laterally compressed; carpels almost terete; ribs not prominent, densely setose with irregularly arranged whitish prickles; vittae all solitary; stylopod conical, ± free from axis of bipartite carpophore; styles divaricate to nearly deflexed. **Seeds** somewhat dorsally compressed, broadly furrowed or almost hollowed on commissural face.

Monotypic genus: *Angoseseli mossamedensis* (Welw. ex Hiern) Norman, Angola.

Apium L.

Cannon: 343 (1970); Cannon: 582 (1978); Cannon & Martins: 29 (1981).

Sthn trop. Afr. 2, widespread weeds, probably introduced in Angola, Zambia, Zimbabwe, Mozambique; 1 species indigenous in sthn Afr.

Berula W.D.J.Koch

Cannon: 349 (1970); Cannon: 598 (1978); Townsend: 71 (1989).

Monotypic genus: *Berula erecta* (Huds.) Coville, cosmopolitan weed recorded in sthn trop. Afr. from Angola and Zimbabwe, and from sthn Afr.

Conium L.

Cannon: 578 (1978); Cannon & Martins: 24 (1981).

Sthn trop Afr. 1: *Conium maculatum* L., Hemlock, highly poisonous, cosmopolitan weed recorded from Zimbabwe, and Mozambique, and from sthn Afr.

***Coriandrum** L.

Cannon: 340 (1970); Cannon: 575 (1978); Cannon & Martins: 23 (1981).

Sthn trop. Afr. 1: **Coriandrum sativum* L., Coriander, escape from cultivation in Angola, Zimbabwe, Mozambique, and sthn Afr.

***Daucus** L.

Cannon: 360 (1970).

Sthn trop. Afr. 1: **D. carota* L., Carrot, occasional escape from cultivation.

Deverra DC.

Cannon: 585 (1978); Pfisterer & Podlech: 571 (1986).

Pituranthos Viv., illegitimate name.

Sthn trop. Afr. 1: *Deverra burchellii* (DC.) Eckl. & Zeyh., Zimbabwe, and sthn Afr.

Diplophium Turcz.

Cannon: 350 (1970); Cannon: 600 (1978); Cannon & Martins: 40 (1981); Townsend: 80 (1989).

Physotrichia Hiern, in part.

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Foeniculum** Mill.

Cannon: 353 (1970); Cannon: 605 (1978); Cannon & Martins: 44 (1981).

Sthn trop. Afr. 1: **Foeniculum vulgare* Mill., Fennel; cultivated and a weed, recorded from Angola, Zimbabwe, Mozambique, and sthn Afr.

Frommia H.Wolff

Wolff: 266 (1912); Cannon: 587 (1978); Townsend: 48 (1989); Bingham & Smith: 140 (2002).

Perennial herbs with a robust woody rootstock; base of stem with persistent fibrous remains of old leaf bases; stem terete, hollow, with fine striations. **Leaves** 3-pinnate, *Ceratophyllum*-like, with very finely divided ultimate segments, mostly grouped near base of stem. **Flowers** in compound umbels with ± 7 fine rays; bracts and bracteoles 0. **Calyx**: teeth obsolete. **Petals** with strongly inflexed apices. **Fruit** pyriform when mature; stylopodium low-conical; styles short, blunt and deflexed; mericarps slightly dorsally compressed, ribs only slightly developed; vittae prominent in mature fruit: 3 in each furrow and ± 6 on commissural face; carpophore slightly 2-

fid at apex. **Seed**: endosperm somewhat curved on inner face.

Monotypic genus: *Frommia ceratophylloides* H.Wolff, S Tanzania and adjoining parts of Zambia and Malawi.

Heracleum L.

Linnaeus: 249 (1753); Cannon: 619 (1978); Townsend: 120 (1989).

Perennial or biennial herbs, with fleshy to woody taproots; stem terete, solid, rather coarsely striate with clearly marked ridges. **Leaves** pinnately divided, usually with 3–7 pairs of broad segments and 1 terminal one, petiole sheathing at base. **Flowers** in compound umbels; rays 7–14, subequal; bracts 0; bracteoles several. **Calyx**: teeth minute or obsolete, unequal. **Petals** white (sometimes flushed with pink, especially in bud), often markedly unequal and radiate, those on outer margin of umbel much larger than those on inside, whole umbel therefore tending to function like a capitulum in attracting insects, although individual flowers remain quite distinct. **Fruit** orbicular to broadly obovate, very strongly dorsally compressed, with a broad commissure; marginal ridges expanded to form a broad wing, dorsal ones filiform; wings somewhat thickened and closely appressed to those of opposing mericarp; vittae solitary in intervals, clearly visible from exterior, and tending to be club-shaped, narrowing towards base, with 2 on commissural face.

Species 65, N temperate and tropical mountains; sthn trop. Afr. 1: *Heracleum abyssinicum* (Boiss.) Norman, reaching its southern limit on the Nyika Plateau, Malawi.

Heteromorpha Cham. & Schldl.

Norman: 236 (1933); Cannon: 340 (1970); Cannon: 232 (1968); Cannon: 578 (1978); Cannon & Martins: 26 (1981); Townsend: 843 (1985b); Townsend: 37 (1989); Winter & Van Wyk: 225 (1996); White *et al.*: 577 (2001); Coates Palgrave: 853 (2002).

Annesorhiza Cham. & Schldl.; Norman: 200 (1929). *Bupleurum* in sense of Norman: 234 (1933).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lefebvrea A.Rich.

Richard: 260 (1840); Norman: 201 (1929) as *Lefeburia*; Cannon: 358 (1970); Cannon: 614 (1978); Cannon & Martins: 54 (1981); Townsend: 109 (1989).

Robust, glabrous biennial or perennial herbs; stems terete, finely and regularly grooved. **Leaves** 2-ternate or 2-pinnate (often rather irregularly so); leaflets linear to lanceolate. **Flowers** in terminal and lateral compound umbels with 10–30 rays; bracts 0–few; bracteoles few to several but probably caducous. **Calyx**: teeth minute or 0. **Petals** pale yellow to greenish white, with intumed apices. **Fruit** broadly elliptic to pyriform, very strongly dorsiventrally compressed with a broad commissure; lateral wings very well-developed and surrounding stylopodium at apex; dorsal ribs filiform, stylopodium well-developed, conical to elongate-conical; vittae large and conspicuous, 1 per interval and 2 on commissural face; carpophore divided to base.

Species 6, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. A rather poorly defined generic group of

5–10 species widely distributed in trop. Africa. Its relationship to *Peucedanum* is in grave need of clarification.

Peucedanum L.

Cannon: 354 (1970); Cannon: 609 (1978); Cannon & Martins: 48 (1981); Townsend: 587 (1987); Townsend: 89 (1989).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Physotrichia Hiern

Hiern: 161 (1873); Cannon: 351 (1970); Cannon: 603 (1978); Townsend: 83 (1989).

Spuriodaucus C.Norman, at least as to *S. atropurpureus* C.Norman: 234 (1933); Cannon: 352 (1970).

Robust biennial or perennial herbs; rootstock woody. **Leaves** mostly basal with nearly bare stems, mostly simple with 3–5 subpalmate lobes. **Flowers** in terminal and lateral compound umbels; bracts and bracteoles present. **Sepals** well-developed, narrowly triangular to subulate, sometimes persisting on mature fruit. **Petals** obovate, apex incurved, white, cream or purple. **Fruit** elliptic to ovoid, slightly dorsiventrally compressed, covered with vesicular hairs especially on ribs; stylopodium conical; styles short and ± divergent; ribs obtuse; vittae well-developed, 1 in each interval and 2 in commissural face; carpophore divided to base; seed concave on commissural face.

Species 10, trop. Africa; sthn tropical Afr. 4, Angola, Zambia, Malawi.

Pimpinella L.

Norman: 199 (1929); Cannon: 345 (1970); Cannon: 589 (1978); Cannon & Martins: 32 (1981); Townsend: 759 (1985a).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseudoselinum C.Norman

Norman: 201 (1929); Cannon: 354 (1970).

Selinum in sense of Norman: 119 (1922).

Glabrous perennial herbs. **Leaves** radical, bipinnatisect. **Flowers** in large, many-rayed umbels with very long thick rays and many involucre bracts. **Flowers** bisexual and unisexual with male flowers in centre of umbels. **Calyx** with obsolete or minute lobes. **Petals** lanceolate, acuminate, with inflexed apex, purplish. **Disc** with undulate margin. **Styles** short; stylopodium small. **Fruit** oval, truncate at base, mericarps strongly dorsoventrally compressed, with 5 broad, rigid wings: 2 lateral ones and 3 slightly narrower ones on the primary dorsal ribs; oil ducts solitary between ribs, large; carpophore bipartite. **Seeds** compressed.

Monotypic genus: *Pseudoselinum angolense* (C.Norman) C.Norman, known only from Angola.

Sanicula L.

Cannon: 565 (1978); Cannon & Martins: 9 (1981); Townsend: 17 (1989).

Sthn trop. Afr. 1: *Sanicula elata* D.Don, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sium L.

Cannon: 350 (1970); Cannon: 598 (1978); Cannon & Martins: 39 (1981).

Sthn trop. Afr. 1: *Sium repandum* Welw. ex Hiern, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Steganotaenia Hochst.

Cannon: 358 (1970); Cannon: 616 (1978); Cannon & Martins: 56 (1981); Townsend: 115 (1989); Coates Palgrave: 852 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Torilis Adans.

Cannon: 340 (1970); Cannon: 570 (1978); Cannon & Martins: 17 (1981); Townsend: 26 (1989).

Sthn trop. Afr. 1: *Torilis arvensis* (Huds.) Link, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- BINGHAM, M.G. & SMITH, P.P. 2002. Zambia. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 135–156. SABONET, Pretoria.
- CANNON, J.F.M. 1968. Proposal to conserve the generic name 5992. *Heteromorpha* Chamisso & Schlechtendal (Umbelliferae). *Taxon* 17: 232–233.
- CANNON, J.F.M. 1970. Umbelliferae. *Conspectus florum angolensis* 4: 334–360, 380, 381.
- CANNON, J.F.M. 1978. Umbelliferae. *Flora zambesiaca* 4: 555–621.
- CANNON, J.F.M. & MARTINS, E.S. 1981. Umbelliferae. *Flora de Moçambique* 87: 1–60.
- CHIOVENDA, E. 1924. *Angosesei*. *Bollettino della Società Botanica Italiana* 1924: 38.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- HIERN, W.P. 1873. On *Physotrichia*, a new genus of Umbelliferae from Angola. *Journal of Botany, London* 11: 161–162.
- HIERN, W.P. 1898. *Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61, 1(2)*. Trustees of the British Museum (Natural History), London.
- LINNAEUS, C. 1753. *Species plantarum*, edn 1. Salvius, Stockholm.
- MAPAURA, A. & TIMBERLAKE, J.R. 2002. Zimbabwe. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 157–182. SABONET, Pretoria.
- MARTINS, E.S. 1994. John Gossweiler. Contribuição da sua obra para o conhecimento da flora angolana. *Garcia de Orta, sér. Botânica* 12(1 & 2): 39–68.
- NORMAN, C. 1922. New Umbelliferae from tropical Africa. *Journal of Botany* 60: 118–120.
- NORMAN, C. 1929. Umbelliferae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67, Supplement 1, Polypetalae: 198–203.
- NORMAN, C. 1933. Umbelliferae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 71, Supplement 1, Polypetalae: 234–236.
- PFISTERER, R. & PODLECH, D. 1986. Revision der Gattung *Deverra* DC. (Umbelliferae). *Mitteilungen der Botanischen Staatssammlung München* 22: 571–604.
- RAUSCHERT, S. 1982. Nomina nova generica et combinationes novae Spermatophytorum et Pteridophytorum. *Taxon* 31: 554–563.
- RICHARD, A. 1840. *Lefebvrea*. *Annales des sciences naturelles; botanique*.

- Paris*, sér. 2, 14: 260.
- STRUGNELL, A.M. 2002. Endemics of Mt. Mulanje. The endemic spermatophytes of Mt. Mulanje, Malawi. *Systematics and Geography of Plants* 72: 11–26.
- TOWNSEND, C.C. 1985a. Notes on *Pimpinella* (Umbelliferae) in Central and East Africa. *Kew Bulletin* 40(4): 759–780.
- TOWNSEND, C.C. 1985b. Some notes on species of *Heteromorpha* (Umbelliferae). *Kew Bulletin* 40(4): 843–850.
- TOWNSEND, C.C. 1987. Notes on *Peucedanum* (Umbelliferae) and allied genera in Central and East Africa. *Kew Bulletin* 42(3): 587–604.
- TOWNSEND, C.C. 1989. *Flora of tropical east Africa*. Umbelliferae: 1–127.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.
- WINTER, P.J.D. & VAN WYK, B.-E. 1996. A revision of the genus *Heteromorpha* (Apiaceae). *Kew Bulletin* 51: 225–265.
- WOLFF, H. 1912. Umbelliferae africanae. *Botanische Jahrbücher* 48: 261–283.

Apocynaceae (in broad sense)

(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Victor, J.E., Bredenkamp, C.L., Venter, H.J.T., Bruyns, P.V. & Nicholas, A. in Leistner: 71 (2000).

The classification of the Apocynaceae reflected here and the keys to subfamilies and tribes are based on Endress & Bruyns (2000). See also Endress (2001) and Omino (2002). The keys to genera are adapted from Leeuwenberg (2001), Omino (1996) and Victor *et al.* (2000). The key to genera of the Asclepiadeae is very tentative as the group still requires much further study (Meve 2002).

Sthn trop. Afr.: genera 85, species ± 407.

Key to the subfamilies of the Apocynaceae (in broad sense)

- 1a Anthers free from the style head; aestivation of corolla lobes in bud typically sinistorse (overlapping to the left), rarely dextrorse; fruit dehiscent or indehiscent, syncarpous or apocarpous, a berry, drupe, follicle, or capsule; seeds naked, with wings, or arils, but almost never with a coma (tuft of hairs) at one end **Rauvolfioideae** (Plumerioideae) [below]
- 1b Anthers adnate or ± adherent to the style head; aestivation of corolla lobes in bud dextrorse (overlapping to the right) or valvate, rarely sinistorse; fruit dehiscent, almost always apocarpous, a pair of follicles, sometimes reduced to one by abortion or postgenitally fused; seeds small, compressed, almost always with a coma at one end:
- 2a Anthers 4-locular, adherent to style head by hairs or secretions, lower part often sterile; filaments free; pollen almost always shed as monads; style head secretions for pollen transport normally a foamy adhesive or gummy, undifferentiated translators; nectaries, if present, in a ring around the base of the ovary **Apocynoideae** [p. 61]
- 2b Anthers 2- or 4-locular, adnate to style head, fertile throughout; filaments free or fused; pollen shed as tetrads or gathered in pollinia; style head secretions for pollen transport forming differentiated translators with a sticky end (viscidium) or pollinaria consisting of 2(4) pollinia attached by flexible arms (caudicles) to a sticky clip (corpuscle); nectaries located in alternistaminal troughs at base of filaments or staminal column:
- 3a Pollen shed in tetrads into spoon-shaped translators with a sticky end which can adhere to a pollinator for removal; anthers 4-locular **Periplocoideae** [p. 63]
- 3b Pollen gathered in pollinia attached in pairs (or 4s) to a ± spherical corpuscle which can become attached to a pollinator for removal; anthers 2- or 4-locular:
- 4a Anthers 4-locular; pollen gathered in 4 very small pollinia attached to a soft, pale corpuscle **Secamonoideae** [p. 63]
- 4b Anthers 2-locular; pollen gathered in 2 pollinia attached to a dark hard corpuscle **Asclepiadoideae** [p. 63]

Subfamily Rauvolfioideae (Plumerioideae)

Sthn trop. Afr.: genera 24, species 72.

Key to tribes of Rauvolfioideae (only for sthn trop. Afr.)

- 1a Anthers usually sagittate at the base and with lignified gynostegial grooves (guide rails); fruit fleshy, either a pair of dehiscent follicles with arillate seeds or an indehiscent berry **Tabernaemontaneae**
(Genera 7, species 16: *Callichilia*, *Carvalhoa*, *Crioceras*, *Schizogygia*, *Tabernaemontana*, *Tabernanthe*, *Voacanga*)
- 1b Anthers rarely sagittate at the base, without lignified gynostegial grooves; fruit fleshy or dry, berries, drupes, follicles, or capsules; arils absent:
- 2a Fruit indehiscent, a berry; leaves almost always opposite:
- 3a Ovary consisting of 2–5 separate carpels; pericarp mostly fibrous **Hunterieae**
(Genera 3, species 5: *Hunteria*, *Picalima*, *Pleiocarpa*)
- 3b Ovary consisting of 2 partly fused carpels; pericarp not fibrous:
- 4a Placentas becoming lignified in fruit, forming a thin woody partition; spines are often present in leaf axils; indole alkaloids absent **Carisseae**
(Genera 2, species 8: *Acokanthera*, *Carissa*)
- 4b Placentas not lignified in fruit; without spines in leaf axils; indole alkaloids present:
- 5a Corolline corona scarcely discernible; shrubs or small trees **Melodineae**
(Genus 1, species 1: *Diplorhynchus*)
- 5b Corolline corona absent; trees, shrubs, or lianes (the latter often with tendrils) **Willughbeieae**
(Genera 8, species 34: *Ancylobotrys*, *Chamaeclitandra*, *Clitandra*, *Cylindropsis*, *Dictyophleba*, *Landolphia*, *Saba*, *Vahadenia*)
- 2b Fruit either indehiscent or dehiscent, but not a berry; leaves opposite, alternate or whorled:

- 6a Seeds without wings or hairs, sometimes with flattened edge, but without well-developed wing(s) or hairs on margin; fruit indehiscent and drupaceous or a pair of dehiscent follicles; style head mostly with basal collar; disc mostly present; herbs, shrubs or trees **Vinceae**
(Genera 2, species 6: *Catharanthus*, *Rauvolfia*)
- 6b Seeds mostly with well-developed (often membranous) wing(s) or hairs on margin; fruit usually a pair of dehiscent follicles; style head with or without a basal collar; disc mostly absent or adnate; trees, shrubs or lianas:
- 7a Corolline corona absent; anthers without apical or basal extensions; leaves whorled, sometimes opposite **Alstonieae**
(Genus 1, species 2: *Alstonia*)
- 7b Corolline corona often present as small lobes in throat or ridges behind anthers; anthers sometimes with short, sterile appendages; leaves opposite; plants of the Old World **Melodineae**
(Genus 1, species 1: *Diplorhynchus*)

For key to genera of Rauvolfioideae see under Apocynoideae (below).

Subfamily Apocynoideae

Sthn trop. Afr.: genera 12, species 57.

Key to tribes of Apocynoideae (only for sthn trop. Afr.)

- 1a Style head spool-shaped, slender in the middle, greatest in diameter at the base; a membranous collar is usually present at the base; a disc is absent or present **Wrightieae**
(Genera 4, species 24: *Adenium*, *Pleioceras*, *Strophanthus*, *Wrightia*)
- 1b Style head globose with slender, elongate, conical apex or broadly ovoid to broadly fusiform, broadest at about the middle and tapering at both ends, or style head cylindrical with 5 vertical ribs; a membranous collar is absent at the base; a disc is almost always present:
- 2a Style head globose with slender, elongate, conical apex, ± round in cross section; anthers attached (sometimes only very weakly so) at about the middle of the style head; thecae are free; a chalazal zone is often present; mostly trees, sometimes lianas **Malouetieae**
(Genera 5, species 15: *Alafia*, *Funtumia*, *Holarrhena*, *Mascarenhasia*, *Pachypodium*)
- 2b Style head broadly ovoid to very broadly fusiform; stamens generally arising near the base of the corolla; anthers attached to the style head by a slender tuft of hairs with a broader sweeping brush of hairs below this; ovary often semi-inferior **Apocyneae**
(Genera 3, species 18: *Baissea*, *Motandra*, *Oncinotis*)

Key to genera of Apocynoideae and Rauvolfioideae (Plumerioideae)

[adapted from Leeuwenberg (2001) and Omino (1996)]

- 1a Leaves alternate:
- 2a Plants spiny and succulent **Pachypodium**
- 2b Plants not spiny, succulent; corolla ample, pink **Adenium**
- 1b Leaves opposite or whorled:
- 3a Leaves whorled:
- 4a Ovary composed of 2–5 separate carpels **Pleiocarpa**
- 4b Ovary composed of 2 partly fused carpels:
- 5a Leaves dull glaucous beneath, with many dense straight secondary veins; large trees; fruits long, slender, dry follicles; seeds with hairs chiefly at both ends **Alstonia**
- 5b Leaves green beneath; secondary veins not dense, usually curved; small trees or shrubs **Rauvolfia**
- 3b Leaves opposite, sometimes subopposite:
- 6a Ovary composed of 2–5 separate carpels; pericarp often fibrous:
- 7a Sepals completely glabrous on both sides; style head subglobose to oblong; inflorescence sessile, predominantly axillary and on old wood; bracts shorter than 0.4 mm **Pleiocarpa**
- 7b Sepals glabrous outside, with colleters inside; style head with a stigmatic oblong to subglobose basal part and a stigmatic apex up to 1.5 mm long; inflorescence predominantly terminal and sometimes axillary; bracts at least 0.5 mm long:
- 8a Sepals imbricate even at anthesis, (3.5–)5.5–7.5 mm long, with colleters covering up to $\frac{1}{3}$ of their length; testa coriaceous; cotyledons with secondary nerves; fruits 110–200 x 80–150 mm, wall very hard and very fibrous **Picalima**
- 8b Sepals imbricate in bud, 7–25 mm long, with colleters covering up to almost half of their length; testa membranaceous; cotyledons without visible secondary nerves; fruits 20–50 x 10–50 mm, wall mostly fleshy **Hunteria**
- 6b Ovary composed of 2 partly fused carpels; pericarp not fibrous:
- 9a Spiny shrubs, climbers or sometimes trees; corolla white or pink; fruit a red to black berry **Carissa**
- 9b Spineless plants; corolla variously coloured; fruit baccaceous or capsular:
- 10a Herbs or undershrubs; corolla with a narrow almost cylindrical tube and a wide flat limb, white and/or pink ***Catharanthus roseus**
- 10b Plants woody; corolla various:
- 11a Corolla lobes overlapping to the left:
- 12a Carpels completely fused:
- 13a Trees or shrubs:
- 14a Repeatedly dichotomously branched shrub with clearly pedunculate inflorescences in the forks; corolla pale yellow with red, purple or violet stripes or dots; fruits orange, often bumpy, 29–64 mm long, resembling mandarins or limes **Tabernanthe iboga**

- 14b Usually differently branched trees or shrubs; with terminal and/or axillary fasciculate inflorescences; corolla white or sometimes pink, without stripes or dots; fruit red to almost black, smooth, up to 32 mm long, subglobose or ellipsoid:
- 15a Ramification not furcate; inflorescence axillary; anthers with stiff hairs; sap extremely poisonous **Acokanthera**
- 15b Ramification usually furcate; inflorescence terminal and sometimes also axillary; anthers glabrous; sap not poisonous **Carissa**
- 13b Climbers or (see couplet 22a) rhizomatous shrubs:
- 16a Corolla tube 25–100 mm long, if 10–17 mm long then lobes falcate; fruits fleshy, apocarpous, thick follicles **Tabernaemontana**
- 16b Corolla tube up to 22 mm long; lobes not falcate:
- 17a Calyx with many colleters inside; leaves with 5–10 pairs of distant secondary veins; flowers conspicuous .. **Vahadenia**
- 17b Calyx without colleters, rarely with 5–15 colleters inside in groups of 1–3 alternating with the sepals:
- 18a Inflorescences of elongate, branched terminal panicles:
- 19a Anthers keeled along the back; ovary and fruit pubescent; stipules absent **Ancylobotrys**
- 19b Anthers not keeled; ovary glabrous and fruit usually glabrous; stipules interpetiolar, early caducous **Dictyophleba**
- 18b Inflorescences contracted, short and often clustered, terminal or axillary, rarely some inflorescences elongate:
- 20a Anthers $\pm \frac{1}{2}$ – $\frac{3}{4}$ as long as the corolla tube; corolla lobes often longer than the tube **Landolphia**
- 20b Anthers up to $\frac{1}{3}$ as long as the corolla tube, frequently less:
- 21a Wall of the corolla tube thickened above the anthers; anthers not keeled:
- 22a Rhizomatous shrubs with straight stems; corolla tube 9–13 mm long; stamens arising in the lower quarter of the corolla tube **Chamaecлитandra**
- 22b Climber with curled tendrils, if a rhizomatous shrub, then stamens arising in the upper half of the corolla tube (*Landolphia gosseweileri*, *L. lanceolata* and *L. thollonii*) **Landolphia**
- 21b Wall of the corolla tube not thickened above the anthers; anthers keeled or not (see also *Landolphia nitidula* and *L. robustior*):
- 23a Only terminal inflorescence developed **Saba**
- 23b Inflorescence axillary or axillary and at the same time terminal:
- 24a Endosperm copious, 20 mm thick; cotyledons 0.2 mm thick; pistil 0.7–1.3 mm long, with head never reaching the stamens; corolla tube 3.2–6.5 mm long **Clitandra**
- 24b Endosperm thin, thinner than 1 mm; cotyledons 2–3 mm thick; pistil 1.7–4.7 mm long, with head reaching the anthers; corolla tube 2.2–4.3 mm long **Cylindropsis**
- 12b Carpels nearly free:
- 25a Corolla with a corona:
- 26a Corona lobes branched, \pm as long as the corolla lobes **Pleioceras**
- 26b Corona lobes unbranched, much shorter than the corolla lobes **Wrightia**
- 25b Corolla without corona:
- 27a Petiole $\pm \frac{1}{3}$ as long as the blade; fruit composed of 2 dry follicles; seeds winged **Diplorhynchus**
- 27b Petiole less than $\frac{1}{4}$ as long as the blade; fruit composed of 2 fleshy or less often dry follicles; seeds not winged:
- 28a Bracts large, 40–110 x 25–70 mm, completely covering the sepals; inflorescence 1- or 2-flowered with large pendulous flowers; Gabon to Angola **Crioceras**
- 28b Bracts shorter to slightly longer than the sepals, never covering them:
- 29a Pistil head coherent with the anthers and therefore style and pistil head shed with the corolla; calyx also shed along with the corolla or some time later, at least before the fruit matures; in the latter case the corolla tube up to 1.4 times as long as the calyx (exceptions to this last character: *V. chalitiana*) **Voacanga**
- 29b Pistil head not coherent with the anthers and therefore pistil still complete after the corolla has been shed; calyx persistent even in fruit; corolla tube probably never less than twice as long as the calyx:
- 30a Corolla lobes inflexed in bud and therefore seemingly much shorter in bud than in open flowers **Tabernaemontana**
- 30b Corolla lobes not inflexed in bud and therefore not or only slightly shorter in bud than in open flowers:
- 31a Corolla large, tube (13–)20–110 mm long, lobes with 2 apices, one rounded and one acute; sepals mostly longer than 5 mm **Callichilia**
- 31b Corolla much smaller, tube (3–)5–10 mm long, lobes with a single rounded or obtuse apex; sepals up to 4 mm long:
- 32a Corolla tube campanulate, not contracted at the mouth, 8–10 mm long, lobes in bud not forming a head; mericarps smooth **Carvalhoa**
- 32b Corolla tube almost cylindric, contracted at the mouth, widest just above the base and therefore often wider than the ovoid apical head when in bud, (3–)5–8.7 mm long; mericarps fused and smooth or lumpy and separate and with soft blunt prickles **Tabernanthe**
- 11b Corolla lobes overlapping to the right:
- 33a Trees or shrubs; corolla lobes not caudate:
- 34a Repeatedly dichotomously branched shrubs; inflorescences in the forks **Schizogygia**

- 34b Shrubs or trees, not repeatedly dichotomously branched; inflorescences terminal and/or axillary:
- 35a Leaves with domatia, often consisting of pits **Funtumia**
- 35b Leaves without domatia (see also *Funtumia africana*):
- 36a Fruit a drupe with a fleshy mesocarp; peduncle usually longer than 20 mm; corolla slightly irregular **Rauvolfia**
- 36b Fruit a dry follicle; peduncle up to 10 mm long; corolla regular:
- 37a Corolla lobes conduplicate in bud, ovate, acute or acuminate, tube clearly widened around the stamens; leaves coriaceous **Mascarenhasia**
- 37b Corolla lobes not conduplicate, narrowly obovate, rounded or nearly so, tube cylindrical, not widened around the stamens; leaves herbaceous, papery when dry **Holarrhena**
- 33b Climbers, if shrubs then corolla caudate:
- 38a Corolla with paired corona appendages between the (frequently long-tailed) corolla lobes; when corolla lobes not long-tailed then tube 24–45 mm long **Strophanthus**
- 38b Corolla with non-paired corona lobes or without corona; tube shorter than 10 mm; if corolla tube up to 21 mm long then stamens exerted:
- 39a Supra-axillary glands absent on the petiole; corolla limb usually spreading or recurved **Alafia**
- 39b Supra-axillary glands present on the petiole; corolla limb often suberect:
- 40a Inflorescence terminal; follicles widest near the base, with a deciduous brown tomentum **Motandra**
- 40b Inflorescence axillary and often at the same time terminal; follicles widest near the middle or cylindrical:
- 41a Anther tails straight, acute; corolla lobes 0.6–2.9 mm long, often suberect or halfway recurved; follicles narrowly cylindrical, up to 0.5(–1) m long, mostly up to 10 mm in diameter **Baissea**
- 41b Anther tails curved, obtuse; corolla lobes 1.7–7.3 mm long, usually spreading; follicles from less than 10 mm to 60 mm wide **Oncinotis**

Subfamily Periplocoideae

Sthn trop. Afr.: genera 8, species 35.

Key to genera of Periplocoideae

- 1a Gynostegium enclosed and concealed within the corolla tube:
- 2a Corona lobes arising in the mouth of the corolla tube **Stomatostemma**
- 2b Corona lobes arising lower down in the corolla tube, mostly around the middle of the tube **Cryptolepis**
- 1b Gynostegium exerted from the mouth of the corolla:
- 3a Corolla tube well defined, broadly campanulate to cylindrical; stamens arising at or near the mouth of the corolla tube **Raphionacme**
- 3b Corolla rotate, lobed almost to the base; stamens arising ± from the base of the corolla:
- 4a Corona small, annular, shortly 5-lobed; translators rhombic, deeply cleft **Batesanthus**
- 4b Corona relatively large; translators spatulate:
- 5a Corona lobes broadly obcordate, usually with a linear dorsal appendage **Mondia**
- 5b Corona lobes ± filiform to linear, simple or divided:
- 6a Stamens hairy **Periploca**
- 6b Stamens glabrous:
- 7a Corolla lobes linear to very narrowly ovate or obovate; corona double: outer one fused into a basal ring with 5 linear segments often bifid at apex; inner one of 5 free filiform segments; pollen in pollinia **Schlechterella**
- 7b Corolla lobes broadly ovate to oblong-ovate; corona simple, of filiform to narrowly ovate segments; pollen in tetrads **Tacazzea**

Subfamily Secamonoideae

Sthn trop. Afr.: genus 1, species 11.

Only genus in sthn trop. Afr. **Secamone**

Subfamily Asclepiadoideae

Sthn trop. Afr.: genera 40, species 232.

Key to tribes of Asclepiadoideae (only for sthn trop. Afr.)

- 1a Pollinia pendent **Asclepiadeae**
- 1b Pollinia erect:
- 2a Pollinia with insertion crest:
- 3a Insertion crest present on inner or lower edge of pollinium; coronal elements absent beneath gynostegial grooves **Marsdenieae**
(Genera 4, species 12: *Cibirhiza*, *Fockea*, *Gongronema*, *Telosma*)
- 3b Insertion crest present on upper or outer edge of pollinium; coronal elements present beneath gynostegial grooves **Ceropegieae**
(Genera 12, species 110: *Brachystelma*, *Ceropegia*, *Duvalia*, *Hoodia*, *Huernia*, *Neoschumannia*, *Orbea*, *Orthanthera*, *Riocreuxia*, *Sisyranthus*, *Stapelia*, *Tavaresia*)
- 2b Pollinia without insertion crest:

- 4a Carpels narrowing gradually into a slender neck below the style head; anther appendages with a basal horizontal slit **Asclepiadeae**
(Genera 24, species 110: *Aidomene*, *Asclepias*, *Aspidoglossum*, *Calotropis*, *Cynanchum*, *Emicocarpus*, *Glossostelma*, *Gomphocarpus*,
Kanahia, *Margaretta*, *Odontostelma*, *Pachycarpus*, *Pentarrhinum*, *Pergularia*, *Periglossum*, *Pleurostelma*, *Sarcostemma*, *Schizostephanus*,
Sphaerocodon, *Stathmostelma*, *Stenostelma*, *Trachycalymma*, *Tylophora*, *Xysmalobium*)
- 4b Carpels without a slender neck, style head therefore sessile on carpels; anther appendages without a basal horizontal slit **Marsdenieae**
(see above for number of genera and species)

Key to genera of Marsdenieae

- 1a Pollinia attached directly to the corpuscle (caudicles absent):
- 2a Corolla rotate; corona with outer lobes basally united into a pentagonal disc adpressed to surface of corolla **Cibirhiza**
- 2b Corolla with a campanulate to cylindric tube; corona forming a cylindric tube around the gynostegium **Fockea**
- 1b Pollinia with slender to stout caudicles attaching them to the corpuscle:
- 3a Corona on staminal column absent; corona on corolla tube present as pubescent ridges with inward directed tips **Gongronema**
- 3b Corona on staminal tube present; anther appendages elongate, membranous, incumbent on style apex or applied to side of conical tip or beak
..... **Telosma**

Key to genera of Ceropegieae

- 1a Stems herbaceous to fleshy, erect, prostrate or twining, with well-developed leaves to ± leafless and tuberculate, but tubercles not arranged into angles; flowers not fleshy:
- 2a Corona present only as a spreading, somewhat arched ridge behind the anthers; style head with slender apex covered by anthers; follicles single by abortion (corolla with a slender tube inflated at the base) **Orthanthera**
- 2b Corona present as 2 or 3 series with outer series sometimes much reduced to a low ridge between the anthers:
- 3a Anthers ascending to erect, pressed into the sides of the style head:
- 4a Corolla tubular, often with an inflated base, 1–3 times as long as the lobes **Riocreuxia**
- 4b Corolla lobes free **Neoschumanniana**
- 3b Anthers horizontal and pressed into the top of the style head:
- 5a Corolla rotate to campanulate, tube broader than long, if longer, then inner corona lobes not exceeding the anthers **Brachystelma**
- 5b Corolla tube longer than broad; inner corona lobes exceeding the anthers, connivent into a column above the style head (rarely shorter than the anthers) **Ceropegia**
- 1b Stems fleshy; leaves reduced to small rudiments or absent, leaf rudiments borne on tubercles arranged into 4 or more angles along the stem; flowers fleshy:
- 6a Outer and inner series of corona lobes vertically well separated on the staminal tube and partly or wholly fused to one another (outer corona often disc-like):
- 7a Leaf rudiments with small stipular denticles; corona stipitate, outer series resting on the rim or the sides of the cup formed by the annulus
..... **Duvalia**
- 7b Leaf rudiments without stipular denticles; corona not stipitate, outer series spreading on the base of the tube and often partly fused to it **Huernia**
- 6b Outer and inner series of corolla lobes not vertically separated on the staminal tube and partly or wholly fused to one another (outer corona never disc-like):
- 8a Tubercles on stems arranged into 6 or more angles; each tubercle armed with 1 or more spines:
- 9a Spines 3 per tubercle; flowers deeply tubular; outer corona with long slender lobules, each tipped with a tear-like knob **Tavaresia**
- 9b Spines 1 per tubercle; flowers rotate to shallowly bowl-shaped; lobes of outer corona short, without an apical knob **Hoodia**
- 8b Tubercles on stems arranged into 4 or 5(6) angles; tubercles not spiny:
- 10a Stems, pedicels, sepals and outside of corolla pubescent (stems sometimes ± glabrous); leaves deciduous, erect; flowers often covered inside with fine slender hairs **Stapelia**
- 10b Stems, pedicels, sepals and outside of corolla glabrous; leaves spreading or absent **Orbea**

Key to genera of Asclepiadeae (a tentative approximation)

- 1a Corona in 3 series; leaves deeply cut into 5 or 7 narrowly triangular lobes; follicles with 4 spines, strongly resembling fruits of *Emex* .. **Emicocarpus**
- 1b Corona in 1 or 2 series; leaves entire; follicles not spiny:
- 2a Corona petal-like, more conspicuous than corolla:
- 3a Plant with grass-like habit and sessile, narrowly linear leaves; corona lobes ligulate-spathulate, entire, with margins involute at base and with 2 wing-like excrescences inside the margins near the base forming a cup- to basin-like structure **Aidomene**
- 3b Plant with subsessile, lanceolate to narrowly oblong leaves; corona lobes usually ± oblong-obovate with irregularly shallowly lobed to entire margin, base claw-like with 2 or 3 teeth next to and on the midrib **Margaretta**
- 2b Corona not petal-like, less conspicuous and usually shorter than the corolla:
- 4a Corona consisting of a ± uniformly tall outer series of fused lobes encircling the gynostegium, often with an inner series of 5 lobes adpressed to the backs of the anthers:
- 5a Stem succulent climbers or shrubs with ± leafless, rod-like stems; outer coronal series ± cupular near base of gynostegium, much shorter than and separated from the inflated vesicular inner lobes adpressed to the backs of the anthers **Sarcostemma**
- 5b Leafy geophytes; stems succulent or not; outer coronal series cupular to tubular, sometimes divided nearly to the base, but equalling or exceeding and obscuring the gynostegium, and fused to the inner lobes if these are present **Cynanchum** and **Schizostephanus**
- 4b Corona consisting of very small lobes beneath the gynostegial grooves (guide rails) (sometimes absent), often accompanied by much larger

- lobes behind the anthers; anthers often with adaxial outgrowths or keels spreading towards the style head:
- 6a Stem twining:
- 7a Corolla with microscopic hairs inside, lobes divided \pm to the base; the corona is absent beneath the gynostegial grooves, the lobes behind the anthers with incurved margins; pollinia are attached by slender caudicles, without an insertion crest **Pentarrhinum**
- 7b Corolla with long hairs towards edges of lobes or at least towards base on inside:
- 8a Milky latex present; corolla with conspicuous hairs towards the edges of the lobes; corona with 5 discrete lobes beneath the gynostegial grooves **Pergularia**
- 8b Colourless latex present; corolla with long hairs on the inside, at least towards the base; corona of 5 minute lobes or teeth **Pleurostelma**
- 6b Stems erect, decumbent or prostrate, mainly herbaceous; rootstock often tubular:
- 9a Anther appendages ascending and covering the style head; style head conical above **Stenostelma**
- 9b Anther appendages adpressed to sides of the style head but not covering it; style head mostly truncate or concave above with a slight central depression:
- 10a Pollinaria with very ornate caudicles considerably longer and broader than the pollinia **Stathmostelma**
- 10b Pollinaria with caudicles shorter and narrower than the pollinia:
- 11a Corona lobes (behind the anthers) fleshy and solid without processes on ventral surface **Xysmalobium** (in part) and **Glossostelma** (in part)
- 11b Corona lobes (behind the anthers) dorsiventrally flattened, or with margins folded inwards, or reduced to 5 minute lobes:
- 12a Corona lobes (behind the anthers) dorsiventrally flattened, lateral margins not folded inwards to form a cavity, sometimes adaxially keeled, or reduced to 5 minute lobes:
- 13a Corona reduced to 5 small to minute lobes **Sphaerocodon**, **Pleurostelma** and **Glossostelma** (in part)
- 13b Corona well-developed:
- 14a Corona lobes (behind the anthers) spreading horizontally or curving outwards from the base, with keels on the inner face; usually fairly robust perennials **Pachycarpus**
- 14b Corona lobes (behind the anthers) erect from the base:
- 15a Flowers in dense, globose, pedunculate heads **Periglossum**
- 15b Flowers in sessile or pedunculate umbels:
- 16a Corona lobes thin; corpuscle linear; pollinia often with a pellucid germination zone **Aspidoglossum**
- 16b Corona lobes thick to fleshy; corpuscle ovoid; pollinia without a pellucid zone **Glossostelma** (in part) and **Xysmalobium** (in part)
- 12b Corona lobes (behind the anthers) flat, with lateral margins folded forward at least in part (usually strongly) to form a cavity (i. e. cucullate or complicate), with or without processes within the cavity:
- 17a Axils of leaves with minute bristles; flowers developing in gradual succession, spirally arranged around the elongating top of the peduncle **Kanahia**
- 17b Axils of leaves without bristles; inflorescences umbellate (flowers radiating \pm from a single point) with flowers all opening \pm simultaneously:
- 18a Plants forming shrubs or trees 2–8 m high with cork-like bark and woody trunk, bearing inflated, \pm smooth fruit 70–100 x 60–70 mm **Calotropis**
- 18b Plants smaller, without woody trunk; fruit shorter than 60 mm and often covered with soft bristles:
- 19a Robust shrubs with many erect perennial branches; rootstock consisting of fibrous roots only, spreading just below the surface **Gomphocarpus**
- 19b Few- to single-stemmed herbs with stems dying back to ground level in the dry season; rootstock thickened below the surface and often forming a tuber:
- 20a Plant usually consisting of a single slender erect stem with linear to ovate leaves:
- 21a Plant densely pubescent with spreading white hairs; usually with papillae in the cavities formed by the cucullate corona lobes **Trachycalymma**
- 21b Plant glabrous to variously pubescent but not densely so; corona lobes glabrous:
- 22a Corona lobes delicate or slightly chartaceous, without a process on the inner face, and not fused into a ring at the base; corpuscle linear; pollinia often with a pellucid germination zone ... **Aspidoglossum**
- 22b Corona lobes transversely oblong, with an oblong to tongue-shaped process on the inner face, fused into a short ring at the base; without a pellucid germination zone **Odontostelma**
- 20b Plant with several stems, stout and erect, or decumbent and then erect:
- 23a Stems strictly erect; leaves glabrous and glaucous; inflorescence nodding **Gomphocarpus**
- 23b Stems initially horizontally spreading, then ascending; leaves scabrid and not glaucous; inflorescences erect **Asclepias**

Acokanthera G. Don

(Plumerioideae—Carisseae)

Kupicha: 404 (1985); Endress & Bruyns: 37 (2000); Coates Palgrave: 943 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Adenium Roem. & Schult.

(Apocynoideae—Wrightieae)

Plaizier: 464 (1985); Endress & Bruyns: 39 (2000); Bingham & Smith: 140 (2002); Coates Palgrave: 959 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aidomene Stopp

(Asclepiadoideae—Asclepiadeae)

Stopp: 17 (1967).

Geophytic perennial herbs with grass-like habit and slender, flexuose stems and globose tuber. **Leaves** sessile, narrowly linear, subulate. **Flowers** in a terminal pseudo-umbel, on long erect pedicels. **Sepals** lanceolate, largely free, densely hairy. **Petals** ovate, twice as long as sepals, brown with white, membranous margin, glabrous. **Corona** simple, campanulate at base, ending in 5 white, ligulate-spathulate lobes almost twice as long as petals, and more conspicuous than petals, with margins involute at base, and with 2 wing-like excrescences inside margins near base forming a cup-like structure. **Pollinia** ovate, pellucid towards apex; caudicles short. **Follicles** always solitary, narrowly fusiform, erect at maturity.

Monotypic genus: *Aidomene parvula* Stopp, only known from Angola.

Alafia Thouars

(Apocynoideae—Malouetieae)

Thouars: 11 (1806); Pichon: 129 (1954); Kupicha: 489 (1985); Leeuwenberg: 769 (1997); Endress & Bruyns: 40 (2000).

Holalafia Stapf; Good: 88 (1929).

Scandent shrubs and lianes with milky latex; spines and tendrils absent. **Leaves** opposite, with a pair of triangular stipules sometimes joined into a single intrapetiolar scale, without acarodomatia or petiolar glands. **Flowers** borne in terminal umbellate cymes. **Calyx**: lobes imbricate, free to base, each overlapped margin with 1 or 2 delicate scales inside at base. **Corolla** hypocrateriform; tube ± cylindrical, slightly wider at middle, glabrous on outer surface except for faint alternipetalous lines of puberulence, ± glabrous within except for a circle of long stiff downwards-pointing hairs below level of stamen insertion; corolla lobes 5, contorted, overlapping to the right, indumentum variable. **Stamens** 5, sessile, arising at about middle of corolla tube and with their tips reaching to mouth of tube; anthers conniving in a cone around gynoecium, polliniferous in upper part only, joined to clavuncle by a retinacle; dorsal surface of anthers often pubescent; disc absent. **Ovary** of 2 free, multi-ovulate carpels pubescent at apex; style glabrous, gradually dilated towards clavuncle, contracted and then widened into a capitate stigma. **Fruit** of 2 follicular mericarps. **Seeds** linear-compressed with an apical coma; endosperm absent.

Species ± 30, 11 native to Madagascar and the rest to trop. Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Mozambique.

Alstonia R.Br.

(Rauvolfioideae—Alstonieae)

Brown: 64 (1810) conserved name; Stapf: 120 (1902); Huber: 68 (1963); De Jong: 1 (1979); De Jong: 985, 986 (1986).

Tall glabrous trees. **Leaves** in whorls of 3–6, more rarely opposite, with more than 25 pairs of lateral veins; stipules absent, but usually with many small colleters in a fringe or covering hollowed base of petiole. **Flowers** relatively small, usually in many-flowered, compound, terminal, umbelliform, corymbose or paniced inflorescences. **Calyx** small, divided almost to base;

segments broadly ovate. **Corolla** salver-shaped; tube slender, cylindrical, sparsely pubescent within, villous at mouth; lobes somewhat obliquely ovate, contorted, overlapping to right. **Stamens** in widened part of corolla tube; filaments filiform, short; anthers free from stigma, 2-lobed at base, polliniferous to base. **Disc** absent or obscurely annular. **Ovary** of 2 free carpels; style filiform, short; stigma with a ring of reflexed frills at base. **Mericarps** 2, follicular, cylindrical, slender. **Seeds** oblong, compressed, with hairs all around edges, but chiefly at both ends.

Species ± 45, Old and New World tropics; sthn trop. Afr. 2, Angola (Cabinda).

Ancylobotrys Pierre

(Rauvolfioideae—Willughbeieae)

Huber: 60 (1963); Kupicha: 422 (1985); Endress & Bruyns: 35 (2000) as *Ancylobotrys*; Victor *et al.*: 78 (2000) as *Ancylobotrys*; White *et al.*: 134 (2001); Coates Palgrave: 949 (2002) as *Ancylobotrys*.

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Asclepias L.

(Asclepiadoideae—Asclepiadeae)

Binns: 19 (1968); Goyder: 247 (1997); Lebrun & Stork: 95 (1997); Goyder: 157 (2001).

Sthn trop. Afr. ± 10, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aspidoglossum E.Mey.

(Asclepiadoideae—Asclepiadeae)

Bullock: 417 (1952); Kupicha: 633 (1984); Müller *et al.*: 10 (2002).

Lagarinthus E.Mey.; Bullock: 420 (1952). *Schizoglossum* E.Mey. in broad sense, as to spp. from outside sthn Afr.; Norman & Moore: 95 (1929); Binns: 22 (1968); Martins: 58 (1994).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Baissea A.DC.

(Apocynoideae—Apocyneae)

De Kruif: 495 (1985a); Van Dilst: 89 (1995).

Zygodia Benth.; Good: 89 (1929).

Sthn trop. Afr. 12, Angola, Zambia, Malawi, and sthn Afr.

Batesanthus N.E.Br.

(Periplocoideae)

Brown: t. 2500 (1896); Brown: 253 (1902/1903); Norman & Moore: 91 (1929); Bullock: 203 (1961); Bullock: 82 (1963).

Woody climbers. **Leaves** opposite, petiolate, glabrous, rather thick, elliptic to oblong-ovate or subrotund, apex abruptly acuminate, base cordate; stipular fringes interpetiolar, reflexed, leathery, subsistent. **Inflorescences** lax lateral panicles. **Calyx** small; sepals 5, almost free. **Corolla** rotate, deeply 5-lobed almost to base; lobes elliptic-ovate, rounded at apex. **Corona** annular, shortly 5-lobed; lobes emarginate, adnate to base of stamens. **Stamens** 5, arising inside corona; filaments short, free; anthers 4-locular, erect, narrowly oblong, cohering apically by triangular appendices over style head; translators (pollen presenters) with a rhomboid, deeply

divided blade on a short slender stalk; pollen granular, in tetrads. **Style head** shortly conical. **Follicles** fusiform, shortly beaked, ± woody, suberect, connate at base. **Seeds** ovate-lanceolate, flattened, acutely keeled on one side, blackish, fringed all around margin, but more densely at two ends, with very long white hairs.

Monotypic genus: *Batesanthus purpureus* N.E.Br., trop. W Africa; sthn trop. Afr.: Angola.

Brachystelma R.Br.

(Asclepiadoideae—Ceropegieae)

Percy-Lancaster: 63 (1988); Newton: 94 (1996); Peckover: 33 (1996); Peckover: 154 (1997); Victor & Nicholas: 205 (1998); Meve & Liede: 89 (2001); Mapaura & Timberlake: 162 (2002); Meve: 20 (2002b).

Dichaelia Harv.; Bullock: 358 (1953b). *Tenaris* E.Mey.; Brown: 472 (1903).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Callichilia Stapf

(Rauvolfioideae—Tabernaemontaneae)

Good: 86 (1929) as *Callichila*; Beentje: 1 (1978); Beentje: 449 (1985); Endress & Bruyns: 35 (2000); Coates Palgrave: 954 (2002).

Species 7, Africa; sthn trop. Afr. 2, Angola (Cabinda), Mozambique, and sthn Afr. (N KwaZulu-Natal).

Calotropis R.Br.

(Asclepiadoideae—Asclepiadeae)

White: 356 (1962); Binns: 20 (1968); Rahman & Wilcock: 301 (1991); Bingham (Unpublished).

Sthn trop. Afr. 1: *Calotropis procera* (Aiton) R.Br., widely distributed; possibly introduced; also in sthn Afr.

Carissa L.

(Rauvolfioideae—Carisseae)

Kupicha: 398 (1985); Endress & Bruyns: 37 (2000); Leeuwenberg & Van Dilst: 3 (2001); White *et al.*: 135 (2001); Coates Palgrave: 945 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carvalhoa K.Schum.

(Rauvolfioideae—Tabernaemontaneae)

Schumann: 189 (1895); Leeuwenberg: 444 (1985a); Leeuwenberg: 47 (1985b); Endress & Bruyns: 35 (2000); White *et al.*: 137 (2001).

Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in forks when flowering; with white latex. **Leaves** opposite, those of a pair equal or unequal, shortly petiolate or sometimes sessile; petioles or leaf bases of a pair united at the base and forming a very short ocrea, with a single row of colleters in axils; lamina elliptic, narrowly elliptic, or narrowly obovate, cuneate, rounded or subcordate at base. **Inflorescence** pedunculate, corymbose, pendulous, lax; bracts caducous before flowers open. **Flowers** regular except for the slightly curved corolla tube. **Calyx** pale green, persistent, even under fruit. **Corolla** white, creamy, or pale yellow, with many red longitudinal lines at base of lobes and at apex of tube; tube longer than calyx; lobes spreading(?) or suberect, in bud overlapping to the left. **Stamens** included; anthers sessile, narrowly triangular, acuminate at ster-

ile apex, sagittate at base, hirt-pubescent outside on connective and inside between tails, introrse. **Ovary** glabrous, broadly ovoid, composed of 2 free carpels, surrounded by an entire disc, which is united with distal sides of ovary; style only slightly widened at apex; clavuncula composed of an entire, thin, slightly recurved ring and a subglobose head, topped by 2 parallel, linear, erect stigma lobes; style and stigma remaining on ovary when corolla is shed. **Fruit** composed of 2 free carpels which usually both develop and which dehisce adaxially; wall soft, orange inside. **Seeds** in 2 irregular rows, surrounded by a darker orange pulpy aril, few, rather large, obliquely ellipsoid or ovoid; at hilar side with one deep groove to half their width, less deeply grooved at the other sides, minutely pustulate; endosperm copious, starchy, creamy, ruminant, surrounding the spatulate embryo.

Monotypic: *Carvalhoa campanulata* K.Schum., trop. Africa; sthn trop. Afr.: Malawi, Mozambique.

***Catharanthus G.Don**

(Rauvolfioideae—Vinceae)

Plaizier: 453 (1985).

C. roseus (L.) G.Don, indigenous to Madagascar but a widespread, sometimes cultivated weed throughout the tropics; also in sthn Afr.

Ceropegia L.

(Asclepiadoideae—Ceropegieae)

Norman & Moore: 98 (1929); Huber: 1 (1957); Stopp: 115 (1964); Stopp: 469 (1971); Lisowski & Malaisse: 401 (1974); Dyer: 43 (1980); Dyer: 133 (1983); Boele: 37 (1988); Masinde & Meve: 205 (2002); Meve: 63 (2002c).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chamaeclitandra (Stapf) Pichon

(Rauvolfioideae—Willughbeieae)

White: 347 (1962); Kupicha: 416 (1985); Leeuwenberg & Berendsen: 165 (1988).

Clitandra henriquesiana K.Schum. ex Warb.; Good: 84 (1929).

Rhizomatous shrubs with straight stems; latex present, abundant in rootstocks; spines and tendrils absent. **Leaves** very neatly arranged, of uniform shape, characteristically deflexed on stem, ovate to lanceolate, with distinct round-tipped acumen and obtuse base, petiolate; stipules absent. **Inflorescences** compact, terminal and lateral, few-flowered cymes. **Calyx**: lobes ± free to base. **Corolla** hypocrateriform; tube glabrous without, pilose within around stamens and near mouth; lobes contorted, overlapping to the left, ± equalling tube, glabrous or ciliate. **Stamens** arising in lower third of tube, anthers subsessile, without carina. **Ovary** hairy; ovules few, in 2 series in each locule; style, clavuncle and stigma very short. **Fruit** a few-seeded glabrous berry without sclerified pericarp.

Monotypic African genus: *Chamaeclitandra henriquesiana* (Hallier f.) Pichon; sthn trop. Afr.: Angola, Zambia. Fruit edible; with refreshing taste.

Cibirhiza Bruyns

(Asclepiadoideae—Marsdenieae)

Bruyns: 51 (1988); Kunze *et al.*: 367 (1994); Endress & Bruyns: 46 (2000); Meve: 107 (2002d).

Perennial herbs or shrublets with milky sap. **Stems** prostrate to scrambling; tuber turnip-shaped, up to 0.3 m (or more?) in diameter. **Leaves** opposite, deciduous, broadly ovate to obovate; petiole $\frac{1}{2}$ to almost as long as blade; 1–3 colleters at base of leaf. **Inflorescence**: 5–10(–20)-flowered, umbelliform axillary clusters; floral bracts ovate, ciliate, small. **Sepals** ovate, obtuse, without colleters. **Corolla** rotate; tube shallowly campanulate; lobes triangular, \pm as long as tube, spreading. **Corona** double, purple-brown, composed of: (1) an outer ring of staminal and interstaminal portions, with the 5 interstaminal portions each forming a nectar cup below guide rails; (2) 5 inner free parts, each consisting of 3 members, all overtopping staminal column; lower (outer) \pm narrowly triangular member sheathing 2 subulate inner members of which the innermost one ends in an erect filiform adaxial appendage twice as long as remainder of corona. **Staminal column**: filaments fused, forming a cylindrical tube surrounding ovaries; top of filament tube adpressed to proximal surface of style head except in the 5 interstaminal corners where it is detached, leaving openings through which stigmatic area is exposed to adaxial side of guide rails (stigmatic chamber). **Style head** pentagonal, salver-shaped, developing glandular areas in its 5 corners. **Fruits** and **seeds** unknown. $x = 11$.

Species 2, 1 in Oman; 1: *Cibirhiza albersiana* H.Kunze, Meve & Liedtke, in Zambia.

Clitandra Benth.

(Rauvolfioideae—Willughbeieae)

Benth.: 445 (1849); Leeuwenberg & Berndsen: 159 (1988).

Large lianas climbing up to 40 m high in trees; latex white; branches densely lenticellate. **Leaves** opposite, shortly petiolate, arising on leaf cushions; simple, entire, elliptic to narrowly elliptic, acuminate with a long obtuse point, cuneate at base; secondary veins in 6–16 pairs. **Inflorescences** axillary, single or paired, thyrsoid, with 10–80 flowers, congested or lax; lower bracts sepal-like, deciduous. **Flowers** fragrant (like *Jasminum*). **Sepals** green, ovate, equal or subequal, \pm pubescent outside, without colleters. **Corolla** urceolate; lobes narrowly oblong to narrowly obovate. **Stamens** included, arising shortly above base of corolla; filaments very short, incurved, glabrous; anthers ovate, with some hairs at apex, introrse, pendent or pointing towards centre. **Ovary** broadly ovoid, 1-locular but often apparently 2-locular due to the 2 parietal placentas almost connate at base and at apex; each placenta with 6–15 ovules; style cylindrical, glabrous; pistil head conical, glabrous. **Fruit** a fleshy, globose or pyriform berry with seeds embedded in a red, fibrous, acid pulp. **Seeds** 6–25, ovoid, black; testa thin, smooth; endosperm copious.

Monotypic genus: *Clitandra cymulosa* Benth., trop. Africa; stn trop. Afr.: Angola.

Crioceras Pierre

(Rauvolfioideae—Tabernaemontaneae)

Pierre: 1311 (1897); Stapf: 128 (1902); Good: 87 (1929); Hallé: 301 (1971).

Glabrous shrubs, climbers or small trees. **Leaves** opposite, decussate; leaves of a pair equal or \pm unequal; petiole very short or 0; blade obovate, acuminate or subobtusate with obtuse to cordate, sometimes slightly asymmetric base; intrapetiolar

stipules present. **Inflorescence** pseudo-axillary or terminal, few- to 1-flowered, situated at point of branching of 2 second order branches. **Flower** large, white, pendent, fragrant, supported by 2 large foliaceous bracts. **Calyx** of 5 free, subequal, ovate-lanceolate, attenuate sepals, each with several colleters on inside. **Corolla**: tube slender and cylindrical to above middle, then funnel-shaped-campanulate or campanulate; lobes broadly ovate-oblong, overlapping to left. **Stamens** arising at point of constriction of corolla tube; anthers subsessile, conniving in a cone, free from stigma, linear-lanceolate, acute, subsagittate, tails subobtusate, empty, solid. **Disc** annular, fleshy, adnate to ovary. **Carpels** 2, connate at base, style filiform; stigma at level of anthers, oblong, 5-grooved, minutely apiculate; ovules many, in many rows. **Mericarps** 2, follicular, diverging, globose or lanceolate-oblong with 2 lateral keels or wings, thinly leathery when dry, tardily dehiscent. **Seeds** ellipsoid, ventrally deeply grooved, coated with a thin aril; testa crustaceous; endosperm horny, deeply ruminated; cotyledons transverse, flat, thin, much shorter than radicle.

Monotypic genus: *Crioceras dipladeniiflorus* (Stapf) K.Schum., tropical W Africa; stn trop. Afr.: Angola (Cabinda).

Cryptolepis R.Br.

(Periplocoideae)

Bullock: 279 (1955b); Venter & Verhoeven: 713 (1997); Venter & Verhoeven: 564 (2001).

Curroia Planch. ex Benth.; Bullock: 360 (1953b); Bullock: 359 (1954). *Ectadiopsis* Benth.; Bullock: 267 (1955b); Binns: 20 (1968). *Mangenotia* Pichon; Bullock: 587 (1955a).

Stn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and stn Afr.

Cylindropsis Pierre

(Rauvolfioideae—Willughbeieae)

Pierre: 38 (1898); Haegens: 316 (1994).

Clitandra sect. *Cylindropsis* (Pierre) Stapf: 61 (1902).

Robust lianas with white latex; branches grey-brown with many lenticels. **Leaves** opposite, petiolate, glabrous, narrowly elliptic to obovate, apex apiculate, often with a long acumen, with 7–14 pairs of conspicuous secondary veins. **Inflorescences**: 3–20-flowered \pm congested cymes, axillary or sometimes also terminal; peduncle and pedicels glabrous. **Sepals** 5, small, ovate, ciliate; colleters absent. **Corolla** salver-shaped; tube \pm cylindrical, widening in upper half, usually glabrous outside and below stamens on inside, variously hairy above stamens; lobes 5, narrowly oblong-triangular, half as long to as long as tube. **Stamens** included; filaments \pm half as long as anthers, usually with a tuft of hairs around base; anthers narrowly ovate, apiculate, dehiscing to base. **Ovary** subglobose, variously pubescent in upper part, 1(2)-locular, gradually narrowing into a glabrous filiform style; style head clavate with 2-lobed stigmatic apex. **Fruit** a syncarpous, globose to ovoid, many-seeded berry; pericarp smooth; pulp creamy, slimy. **Seeds** ellipsoid; testa thin; endosperm thin; cotyledons ellipsoid.

Monotypic genus: *Cylindropsis parvifolia* Pierre, tropical W Africa; stn trop. Afr.: Angola (Cabinda).

Cynanchum L.

(Asclepiadoideae—Asclepiadeae)

Bullock: 354 (1953b); Bullock: 621 (1956); Binns: 20 (1968); Liede: 503 (1993); Liede: 283 (1996a).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dictyophleba Pierre

(Rauvolfioideae—Willughbeieae)

Pierre: 92 (1898); Kupicha: 420 (1985); De Hoogh: 207 (1989).

Landolphia P.Beauv., in part.

Tendrillous lianes climbing to 15 m and more; latex abundant; spines absent. **Leaves** obovate, oblong-obovate or elliptic, base shortly auricled; petiolate; stipules interpetiolar. **Inflorescences** loose, elongate terminal panicles of few-flowered cymes. **Flowers** sweet-scented. **Calyx**: lobes imbricate, free to base, with conspicuous glandular auricles. **Corolla** hypocrateriform; tube cylindrical, slightly enlarged at level of anthers; lobes narrowly linear, contorted, overlapping to the left, long-ciliate on inner margins. **Stamens** inserted in corolla tube between $\frac{1}{4}$ and $\frac{3}{4}$ of its length; filaments very short; anthers without carina. **Ovary** glabrous, multi-ovulate; clavuncle positioned at base of anthers. **Fruit** a many-seeded glabrous berry lacking a sclerified layer in pericarp.

Species 5, African; sthn trop. Afr. 1: *Dictyophleba lucida* (K.Schum.) Pierre, Angola, Zambia, Zimbabwe, Malawi, Mozambique.**Diplorhynchus Welw. ex Ficalho & Hiern**

(Rauvolfioideae—Melodineae)

White: 348 (1962); Plaizier: 451 (1985); Coates Palgrave: 951 (2002); Bingham (Unpublished).

Monotypic genus: *Diplorhynchus condylocarpon* (Muell. Arg.) Pichon, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**Duvalia Haw.**

(Asclepiadoideae—Ceropegieae)

Meve: 1 (1997); De Kock: 28 (2000b).

Sthn trop. Afr. 1: *Duvalia polita* N.E.Br., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.**Emicocarpus K.Schum. & Schltr.**

(Asclepiadoideae—Asclepiadeae)

Schumann & Schlechter: 21 (1900).

Perennial herbs with slender, terete, prostrate stems minutely puberulous along one line when young. **Leaves** petiolate, hastate, deeply, almost palmately incised into 5 or 7 very narrowly triangular lobes, middle lobe twice as long or more than lateral ones; petiole canaliculate above. **Inflorescences** few-flowered, axillary umbels on long peduncles minutely pilose along one line. **Flowers** pedicellate; bracteoles minute, subulate. **Sepals** oblong-lanceolate, acuminate, with solitary interposed finger-shaped colleters. **Corolla** rotate, with glabrous lobes overlapping to the right. **Corona** triple: outer one of tongue-shaped, obtuse lobes opposite the petals; middle one of 10 paired, slightly longer and narrower lobes alternat-

ing with lobes of outer corona; lobes of inner corona similar to those of outer corona but somewhat smaller and opposite stamens and slightly adnate to corolla. **Stamens** ending in a 2-lobed, membranous connective; corpuscle very small; translator arms twisted. **Style head** swollen, ellipsoid, raised well above gynostegium. **Ovary** with two ovules. **Follicles** resembling fruit of *Emex*: with 3 spines, 2 lateral and 1 apical; pedicel short and spiny. **Seed** horseshoe-shaped, brown.

Monotypic genus: *Emicocarpus fissifolius* K.Schum. & Schltr. This incredible plant was recorded from near Maputo, coastal Mozambique.**Fockea Endl.**

(Asclepiadoideae—Marsdenieae)

Court: 69 (1987); Marloth: 67 (1987); Kunze *et al.*: 367 (1994); Endress & Bruyns: 17 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, ?Malawi, Mozambique, and sthn Afr.

Funtumia Stapf

(Apocynoideae—Malouetieae)

Stapf: 2 (1899); Good: 88 (1929); Zwetsloot: 484 (1985); Zwetsloot: 966, 967 (1986); Coates Palgrave: 958 (2002).

Evergreen trees or shrubs, with white sticky latex; bark smooth, sometimes with a few lenticels; wood of low density, soft; branches terete, sometimes lenticellate, very dark brown; branchlets smooth, terete or laterally compressed with a longitudinal groove below the ocrea. **Leaves** opposite, petiolate, those of a pair connate into a short ocrea, with many small colleters in 2 or 3 rows in axils; lamina ovate, elliptic or oblong, decurrent into petiole, acuminate at apex, entire, glabrous above; often with domatia in axils of secondary veins; margin both undulate and revolute. **Inflorescences** congested, terminal and axillary, cymose, much shorter than leaves; peduncle short; bracts ovate or elliptic, often with small colleters in axils. **Flowers** regular, fleshy, fragrant. **Sepals** free, thick, ovate or nearly so, obtuse or subacute at apex, often membranous and minutely ciliate at margin, inside with a single row of colleters at base. **Corolla**: tube ventricose at middle, inside thickened at throat, densely hirtopubescent from insertion of stamens to level of apex of ovary; lobes overlapping in bud to the right, entire, recurved. **Stamens** included; filaments very short or absent; anthers narrowly triangular, introrse. **Ovary** of 2 almost free carpels united by base of style; clavuncula grading into a conical stigma; disc 5-lobed; ovules pendulous. **Follicles** 2, connate at base. **Seeds** slender, fusiform, apex with long straight hairs; testa rugose; embryo straight.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique.

Glossostelma Schltr.

(Asclepiadoideae—Asclepiadeae)

Bullock: 414 (1952); Binns: 21 (1968); Goyder: 527 (1995).

Slender or robust, erect perennial herbs with a short, often stout vertical rhizome with fusiform lateral roots; stem usually solitary, simple, often with a line of pubescence running along stem. **Leaves** usually petiolate, linear to ovate or

spathulate. **Inflorescences** umbelliform, with or without peduncle, arising terminally and axillary at upper 1–4(–6) nodes. **Corolla** campanulate, lobed almost to base, medium to large. **Corona** 5-lobed, often fleshy, united very shortly at base and attached to staminal column near base of anthers; staminal column usually with a conspicuous stalk below attachment of corona lobes. **Style head** 5-angled, generally \pm level with top of anthers and largely obscured by anther appendages; corpuscle ovoid, brown or black; caudicles flattened, held \pm at right angles to axis of corpuscle; pollinia pendulous, flattened. **Follicles** erect, lanceolate or ovate-lanceolate in outline, apex attenuate; fruiting pedicel not contorted; usually only 1 follicle developing. **Seeds** flattened with one face convex, ovate to \pm circular in outline with a narrow convoluted rim surrounding a verrucose disc.

Species 12, trop. Africa; sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Gomphocarpus R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 406 (1952); Bullock: 339 (1953b); Bruyns: 165 (1995); Goyder & Nicholas: 769 (2001).

Asclepias L., in part; Brown: 313 (1902/1903).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gongronema (Endl.) Decne.

(Asclepiadoideae—Marsdenieae)

Bullock: 196 (1961).

Dregea E.Mey.; Bullock: 512 (1957); Binns: 20 (1968). *Gymnema* R.Br.; White: 359 (1962); Binns: 21 (1968). *Marsdenia* of various authors, in part, not of R.Br.; Norman & Moore: 97 (1929); Bullock: 364 (1954); Bullock: 287 (1955b); Bullock: 510 (1956); Bullock: 510 (1957); White: 359 (1962).

Perennial vines or subshrubs, glabrous. **Leaves** opposite. **Inflorescences** umbel-like cymes or umbels. **Calyx** 5-partite, small, ovate-acuminate. **Flowers** small or of moderate size. **Corolla** campanulate, often constricted at the throat; lobes erect to spreading, overlapping to the left. **Corona** of 5 small, wart-like fleshy lobes with basal parts adnate to staminal column. **Anthers** 2-locular, terminated by membranous appendages which are free or connate. **Pollinia** sessile, erect, attached by short to elongated caudicles. **Style head** conical or truncate. **Follicles** with a thick pericarp, smooth, sometimes winged. **Seeds** crowned with a tuft of hairs.

Species \pm 20, Old World tropics; sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Holarrhena R.Br.

(Apocynoideae—Malouetieae)

De Kruif: 456 (1985a); De Kruif: 969, 971 (1986); Coates Palgrave: 951 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hoodia Sweet ex Decne.

(Asclepiadoideae—Ceropegieae)

Bruyns: 145 (1993); Plowes: 3 (1996); De Kock: 30 (2000b); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Angola, Zimbabwe, and sthn Afr.

Huernia R.Br.

(Asclepiadoideae—Ceropegieae)

Kers: 179 (1969); Kimberley: 60 (1986); Leach: 1 (1988); De Kock: 31 (2001a); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hunteria Roxb.

(Rauvolfioideae—Hunterieae)

Roxburgh: 531 (1824); Kupicha: 430 (1985); Omino: 88 (1996); Coates Palgrave: 956 (2002).

Shrubs or trees up to 40 m high; stems and leaves completely glabrous; latex present; spines and tendrils absent. **Leaves** opposite, oblong to elliptic, entire, \pm concolorous; petiolate; stipules absent. **Inflorescences** cymose, terminal, rarely also axillary, few- to many-flowered; pedicels present, up to 10 mm long. **Calyx** glabrous; lobes free or connate at extreme base, herbaceous, imbricate, not revolute, with colleters inside covering part of ventral surface of sepals. **Corolla** hypocrateriform, externally glabrous, internally hairy above and below stamens; tube not developing splits (as in *Pleiocarpa*); lobes contorted, overlapping to the left, not ciliate. **Stamens** included, arising at or above middle of corolla tube; filaments short, anthers dorsifixed, longitudinally dehiscent, introrse, without carina. **Ovary** of 2 separate, glabrous mericarps diverging at 90–180°, with 2–30 ovules per mericarp; pistil head composed of a subglobose basal stigmatic part and a stigmoid apex. **Fruit** composed of 2 separate diverging subglobose to obovoid, fleshy to fibrous mericarps. **Seeds** somewhat angular, smooth, brown; embryo straight, spatulate, surrounded by thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons thin, leafy, radicle almost cylindrical.

Species 12, trop. Africa with 1 of them also in tropical Asia; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Kanahia R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 421 (1952); Field *et al.*: 787 (1986); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Kanahia laniflora* (Forssk.) R.Br., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Landolphia P.Beauv.

(Rauvolfioideae—Willughbeieae)

White: 349 (1962); Kupicha: 408 (1985); Persoon *et al.*: 6 (1992); Endress & Bruyns: 35 (2000); White *et al.*: 138 (2001); Coates Palgrave: 949 (2002).

Aphanostylis Pierre; White: 347 (1962); Huber: 418 (1985); *Carpodinus* R.Br. ex G.Don; Good: 84 (1929).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Margaretta Oliv.

(Asclepiadoideae—Asclepiadeae)

Bullock: 411 (1952); Mwanyambo: 717 (1996).

Herbaceous perennials with a carrot-shaped tuberous rootstock; stems usually simple. **Leaves** opposite, subsessile. **Inflorescence** terminal and lateral, umbellate. **Corolla** deeply 5-lobed, commonly revolute. **Corona** 5-lobed, petaloid, more showy than corolla, variable in shape, 2- or 3-toothed on claw. **Style head** capitate, hemispherical, subconical, truncate or obtuse. **Follicles** in pairs, fusiform, beaked, smooth, pubescent; fruiting pedicel not contorted.

Monotypic genus: *Margaretta rosea* Oliv., trop. Africa; sthn trop. Afr. 2 subspecies, Zambia, Zimbabwe, Malawi, Mozambique.

Mascarenhasia A.DC.

(Apocynoideae—Malouetieae)

Candolle: 487 (1844); Kupicha: 487 (1985); White *et al.*: 141 (2001); Coates Palgrave: 958 (2002).

Lanugia N.E.Br.; Burt Davy *et al.*: 27 (1958).

Shrubs or small trees with milky latex; spines and tendrils absent. **Leaves** opposite, obovate-oblong, oblong or elliptic; with petiolar glands; without domatia; stipules absent. **Flowers** often large and conspicuous, solitary or in few-flowered fasciculate cymes, terminal. **Calyx**: lobes imbricate, free to base, with many glandular scales inside at base. **Corolla** hypocrateriform; tube divided into 2 distinct regions of varying shape and proportions; lobes 5, with induplicate aestivation, straight in bud or twisted to the right. **Stamens** 5, sessile, inserted at base of upper region of corolla tube; anthers conniving in a cone around gynoecium, polliniferous in upper part only, joined to clavuncle by a retinacle. Receptacular disc cupular or represented by separate oppositipetalous scales, these sometimes united in pairs. **Ovary** of 2 free multi-ovulate carpels, glabrous or hairy; style pubescent; clavuncle swollen; stigma pointed or flared at apex, not bifid. **Fruit** of 2 follicular mericarps. **Seeds** linear-compressed with an apical coma; endosperm absent.

Species 10, 9 endemic to Madagascar and 1 distributed from Madagascar and the Comores to trop. Africa; sthn trop. Afr. 1: *Mascarenhasia arborescens* A.DC., Zimbabwe, Malawi, Mozambique.

Mondia Skeels

(Periplocoideae)

Bullock: 203 (1961); Bullock: 82 (1963); White *et al.*: 162 (2001); Mapaura (Unpublished); Phiri (Unpublished)

Chlorocodon Hook.f.; Brown: 254 (1902/1903); White: 356 (1962); Binns: 20 (1968).

Species 2, trop. Africa; sthn trop. Afr. 1: *Mondia whitei* (Hook.f.) Skeels, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Motandra A.DC.

(Apocynoideae—Apocynae)

Candolle: 423 (1844); Stapf: 224 (1902); De Kruif: 973, 974 (1986).

Scandent shrubs. **Leaves** opposite, secondary veins distant; stipules and axillary glands absent. **Inflorescences**: terminal, rather loose panicles; flowers inconspicuous. **Calyx** small, divided almost to base; sepals imbricate, ovate, obtuse. **Corolla** somewhat funnel- to salver-shaped; tube \pm cylindrical, with 5 longitudinal grooves outside and corresponding ridges inside descending from sinuses to middle and there touching a ring of hairs consisting of 5 suprabasal arches; mouth naked; lobes linear-oblong or ovate, overlapping to the right. **Stamens** arising above base of corolla tube; filaments filiform-clavate, short; anthers sagittate, conniving into a cone, included, linear, terminating in a minutely plumose mucro; appendages slightly shorter than polliniferous part; tails short, obtuse, recurved; foot of connective projecting. **Disc** cupular, 5-lobed, fleshy. **Carpels** free, slightly inferior, adnate to disc up to or beyond middle; style very short; stigma spindle-shaped, with 2 linear lobes; ovules many, in many rows. **Mericarps** 2, follicular, lanceolate in outline, divaricate. **Seeds** oblong, with a long deciduous apical coma; endosperm scanty.

Species 10, W trop. Africa; sthn trop. Afr. 2, Angola.

Neoschumannia Schltr.

(Asclepiadoideae—Ceropegieae)

Schlechter: 38 (1905); Liede & Kunze: 275 (1993); Meve: 233 (1995); Mapaura & Timberlake: 178 (2002).

Swynnertonia S.Moore.

Large, woody climbers with slender stems, glabrous; latex clear. **Leaves** large, with long petioles, elliptic to broadly ovate. **Inflorescences** 3- to many-flowered, extra-axillary, pedunculate, bostrychoid, lax, with small floral bracts; pedicels filiform, \pm pendulous. **Calyx** fused at its swollen base, one colleter in each intersepal sinus. **Petals** not fused at base, lanceolate, lax. **Corona** gynostegial, tripartite [formula: C(is) + Cs]: Staminal corona (Cs) is supported by a C(is) consisting of interstaminal lobes connate to a skirt with appendages predominantly developed in staminal position; skirt membranous, basally \pm fused, interstaminal parts of C(is) sickle-shaped, bidentate, villous; staminal corona lobes (Cs) erect, lanceolate to obovate, with a basal hump. **Gynostegium** borne on a column; guide rails short, oblique, protruding. **Anthers** subquadrangular; pollinarium (sub)erect, pollinia broadly ovate to quadrangular, with pellucid germination mouth on inner margin, yellow, corpusculum elliptic; style head flat or depressed, white. **Follicles** long, slender, glabrous. **Seeds** not seen.

Species 2, trop. Africa; sthn trop. Afr. 1: *Neoschumannia cardinea* (S.Moore) Meve, Zimbabwe.

Odontostelma Rendle

(Asclepiadoideae—Asclepiadeae)

Rendle: 161 (1894); Norman & Moore: 96 (1929); Bullock: 619 (1956).

Schizoglossum as to *S. welwitschii* (Rendle) N.E.Br.: 365 (1902/1903); Kupicha: 669 (1984).

Perennial, glabrous herbs with a solitary, slender, erect stem; tuber carrot-like with long neck. **Leaves** linear with revolute

margins. **Inflorescence** lateral, 4–6-flowered umbels; bracts absent or minute; flowers greenish brown. **Sepals** lanceolate, acute. **Corolla** broadly campanulate, 5-lobed nearly to base; lobes spatulate. **Corona** arising at base of staminal column, not reaching base of anthers, shortly annular at base, divided into 5 transversely oblong, truncate lobes with sides incurved at apex and with an oblong or tongue-shaped process on inner face at middle slightly longer than rest of lobe. **Stamens**: anther appendages small, ovate, acute, inflexed over apex of style.

?Monotypic: *Odontostelma welwitschii* Rendle, only known from sthn trop. Afr.: Angola, Zambia, Zimbabwe. The status of this species is uncertain.

Oncinotis Benth.

(Apocynoideae—Apocynae)

De Kruif: 5 (1985b); Kupicha: 492 (1985); De Kruif: 977, 978 (1986); White *et al.*: 142 (2001); Coates Palgrave: 961 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Orbea Haw.

(Asclepiadoideae—Ceropegieae)

Leach: 287 (1975); Leach: 4 (1978); Kimberley: 61 (1986); Bruyns: 72 (2000c); De Kock: 34 (2001a).

Caralluma R.Br., in part; Norman & Moore: 100 (1929); Binns: 20 (1968); Kimberley: 60 (1986). *Diplocyatha* N.E.Br. *Stultitia* E.Phillips. *Orbeopsis* L.C.Leach: 61 (1978); Kimberley: 62 (1986); Mapaura & Timberlake: 162 (2002). *Pachycymbium* Lindl.; Leach: 69 (1978); Kimberley: 62 (1986); De Kock: 4 (2001b); Mapaura & Timberlake: 162 (2002). *Angolluma* Munster; De Kock: 29 (2000a).

Species 55, 31 in Africa S of the equator, 25 N of the equator and the Arabian Peninsula; sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Orthanthera Wight

(Asclepiadoideae—Ceropegieae)

Brown: 433 (1903); Norman & Moore: 98 (1929); Phiri (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, and sthn Afr.

Pachycarpus E.Mey.

(Asclepiadoideae—Asclepiadeae)

Bullock: 329 (1953b); Kupicha: 667 (1984); Smith: 399 (1988); Goyder: 335 (1998a); Goyder: 882 (1998c).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pachypodium Lindl.

(Apocynoideae—Malouetieae)

Norman & Moore: 90 (1929); Codd: 283 (1963); Kupicha: 462 (1985); Rapanarivo *et al.*: 1 (1999); Coates Palgrave: 959 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Pentarrhinum E.Mey.

(Asclepiadoideae—Asclepiadeae)

Liede & Nicholas: 475 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pergularia L.

(Asclepiadoideae—Asclepiadeae)

Brown: 323 (1907); Brown: 757 (1907–1909); Binns: 21 (1968); Liede: 63 (1990); Liede: 481 (1996c); Mapaura (Unpublished).

Daemia R.Br.; Norman & Moore: 96 (1929).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Periglossum Decne.

(Asclepiadoideae—Asclepiadeae)

Schlechter: 32 (1905); Brown: 581 (1907–1909); Liede & Albers: 214 (1994); Victor *et al.*: 89 (2000).

Sthn trop. Afr. 1: *Periglossum mossambicense* Schltr., Mozambique, and sthn Afr. This genus is not listed in Endress & Bruyns (2000).

Periploca L.

(Periplocoideae)

Schumann: 216 (1895); Brown: 256 (1902/1903); Norman & Moore: 91 (1929); Binns: 21 (1968); Venter: 123 (1997); White *et al.*: 163 (2001); Mapaura & Timberlake: 168 (2002) under Periplocaceae.

Parquetina Baill.; Bullock: 204 (1961); White *et al.*: 162 (2001).

Twining or erect shrubs, glabrous; with milky latex. **Leaves** opposite, sometimes absent, herbaceous or coriaceous. **Flowers** small to medium-sized, in lax axillary or terminal cymes. **Calyx** 5-partite; lobes short; 5 intersepal glands. **Corolla** rotate, 5-lobed nearly to base; lobes overlapping, slightly twisted. **Corona** of 5 filiform or linear lobes, arising from corolla at or a little above insertion of stamens and opposite them, simple or divided, with or without a ± broadly dilated base which is often ± spreading and adnate to base of corolla lobes and usually 2-keeled within. **Stamens** arising from corolla a little above its base; filaments free, short; anthers adnate to style at their base, with connective produced into an apiculus by which they are usually connate at their tips. **Style** shorter than anthers, convex or subtruncate at apex; translators spoon-shaped. **Follicles** smooth. **Seeds** crowned with a tuft of hairs.

Species 14, Mediterranean to E Asia and trop. Africa; sthn trop. Afr. 2, Angola, Malawi.

Picalima Pierre

(Rauvolfioideae—Hunterieae)

Pierre: 1278 (1896); Stapf: 96 (1902); Good: 85 (1929); Pichon: 81 (1953a); Omino: 128 (1996).

Trees or shrubs with white latex in all parts; branchlets glabrous. **Leaves** opposite, petiolate, those of a pair equal or subequal, elliptic to oblong, entire, glabrous. **Inflorescence** a compound, umbellate cyme, terminal or sometimes axillary, pedunculate. **Flowers** ± regular, fragrant. **Sepals** connate at extreme base, imbricate, glabrous outside, with 2–4 rows of colleters at base. **Corolla** white to yellow, tube almost cylindrical, often greenish, glabrous outside, pubescent inside below stamens; lobes overlapping to left in bud, entire, glabrous,

spreading and later recurved. **Stamens** arising above middle of corolla tube, included; filaments very short, filiform, glabrous; anthers ovate in outline, cordate at base, glabrous, thecae 2, parallel, longitudinally dehiscent. **Ovary** of 2 separate glabrous carpels united at base by a disc-like thickening; ovules many per carpel; pistil head composed of a basal cylindrical stigmatic part and a filiform stigmatic apex. **Fruit** composed of 2 separate divaricate, obovoid to ellipsoid mericarps with rounded apex and containing up to 80 seeds. **Seeds** somewhat angular, smooth, brown; testa hard; embryo straight, spathulate, surrounded by thick, rather hard starchy endosperm leaving a hole around radicle apex, cotyledons thick.

Monotypic genus: *Picalima nitida* (Stapf) T. & H. Durand, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Pleiocarpa Benth.

(Rauvolfioideae—Hunterieae)

Bentham: 685, 699 (1876); Good: 85 (1929); Pichon: 123 (1953a); Kupicha: 432 (1985); Omino: 134 (1996); Endress & Bruyns: 36 (2000); Coates Palgrave: 950 (2002).

Evergreen shrubs or trees; stems and leaves completely glabrous; white latex present in all parts; spines and tendrils absent. **Leaves** opposite or in whorls of 3–5, elliptic to obovate; petiole angled, often narrowly winged; stipules absent. **Inflorescences** cymose, axillary, rarely also terminal; pedicels short or absent. **Calyx** glabrous; lobes free to base, herbaceous, imbricate, not revolute, without scales on inner surface. **Corolla** hypocrateriform, externally glabrous, internally pubescent below stamens; tube often with 5 splits developing at level of stamens; lobes contorted, overlapping to the left, not ciliate. **Stamens** arising at or above middle of corolla tube; filaments short; anthers dorsifixed, introrse, longitudinally dehiscent. **Ovary** glabrous, composed of 2–5 separate carpels, with 1–4 ovules per carpel; clavuncle present; stigma reduced to a sessile area or rarely represented by a rudimentary apiculus. **Fruit** a compound berry of 2 variously shaped, fleshy to slightly fibrous mericarps with a rounded to hook-shaped apex. **Seeds** variously shaped, with smooth brown testa; embryo straight, spathulate, surrounded by a thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons elliptic, thin and leafy, radicle almost cylindrical.

Species ± 5, trop. Africa; sthn trop. Afr. 2(?)3, Angola, Zambia, Zimbabwe, Mozambique.

Pleioceras Baill.

(Apocynoideae—Wrightieae)

Baillon: 759 (1888); Barink: 482 (1985); Barink: 1004, 1005 (1987); Endress & Bruyns: 39 (2000); Coates Palgrave: 965 (2002).

Shrubs, lianas or trees up to 9 m high, with white latex; branches unarmed, with pale lenticels; branchlets terete, often sulcate when dry. **Leaves** opposite, those of a pair equal or subequal, shortly petiolate, with colleters in 1 or 2 rows in axils; lamina acuminate, rounded or cuneate at base. **Inflorescences** terminal, paniculate, several- to many-flowered, lax; lower bracts leafy; others narrowly oblong, acute, with colleters in axils. **Flowers** regular except for sometimes slightly unequal sepals, small. **Calyx** persistent beneath fruit; sepals green,

connate at base, ovate, imbricate, entire, pubescent or glabrous outside, ciliate inside at base near edge with 0 or 1 triangular or ovate colleters (in whole flower 3–10). **Corolla** ± trumpet-shaped; tube ventricose in middle, outside glabrous at base and minutely pubescent at apex; lobes overlapping to left in bud, elliptic, rounded, entire, ciliate. **Stamens** exerted, but covered by appendages; filaments short, filiform, glabrous outside; anthers introrse, sagittate at base, apiculate and pilose at apex, fertile for 1/2 of length just below apices. **Pistil** glabrous or sometimes with a few papillae; ovary superior, subglobose; carpels 2, free, rounded; disc none; style split at base; stigma minute, bilobed; ovules many, in several rows. **Follicles** 2, spreading, almost free, pendulous, slender, adaxially dehiscent, glabrous outside. **Seeds** many, in two or more rows, linear to very narrowly oblong, finely grooved, glabrous, with a ± dense tuft of retrorse hairs at apices; embryo large, surrounded by very scanty whitish endosperm.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola, Mozambique.

Pleurostelma Baill.

(Asclepiadoideae—Asclepiadeae)

Bullock: 612 (1956); Liedtke: 91 (1994).

Podostelma K. Schum.; *Microstephanus* N.E.Br.: 288 (1902/1903).

Perennials with procumbent or twining stems. **Leaves** opposite. **Flowers** small, in few-flowered umbel-like cymes, sublateral between bases of petioles. **Calyx** deeply 5-lobed; lobes small, oblong-ovate. **Corolla** campanulate; tube short; lobes lanceolate, overlapping and twisting to left in bud. **Corona** of 5 minute lobes or teeth alternating with anthers at their base. **Staminal column** arising a little above bottom of corolla tube; filamental part very short; anthers oblong, erect, strongly convex at back, with horny margins or wings forming gynostegial grooves, strongly incurved towards centre of flower; appendages suberect, membranous; pollinia pendulous, with very short caudicles. **Style** produced into a beak beyond anther appendages. **Follicles** lanceolate-acuminate, smooth. **Seeds** crowned with a tuft of hairs.

Species 2, E African coast from Somalia to Mozambique, Madagascar, and Aldabra islands; sthn trop. Afr. 1: *Pleurostelma cernuum* (Decne.) Bullock, Mozambique.

Raphionacme Harv.

(Periplocoideae)

Norman & Moore: 92 (1929); Bullock: 59 (1953a); Bullock: 353 (1953b); Binns: 21 (1968); Venter & Verhoeven: 72 (1988a); Venter & Verhoeven: 380 (1988b); Venter & Verhoeven: 705 (1997); Verhoeven & Venter: 46 (1997); Venter & Verhoeven: 169 (2000).

Chlorocyathus Oliv.: t. 1557 (1887). *Pentagonanthus* Bullock: t. 3583 (1962b); Bullock: 85 (1963); Bingham & Smith: 154 (2002).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rauvolfia L.

(Rauvolfioideae—Vinceae)

Good: 86 (1929) as *Rauwolfia*; White: 350 (1962); Codd: 274 (1963); De Kruif: 458 (1985a); Van Dilst & Leeuwenberg: 21 (1991); White *et al.*: 142 (2001); Coates Palgrave: 957 (2002); Koch *et al.*: 83 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Riocreuxia Decne.

(Asclepiadoideae—Ceropegieae)

Binns: 21 (1968); Dyer: 83 (1980); Dyer: 227 (1983); White *et al.*: 163 (2001).

Ceropegia in sense of Huber: 167 (1957), in part.

Sthn trop. Afr. 2(3), Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Saba (Pichon) Pichon

(Rauvolfioideae—Willughbeieae)

Pichon: 302 (1953b); Kupicha: 427 (1985); Leeuwenberg & Van Dilst: 189 (1989); Endress & Bruyns: 35 (2000); White *et al.*: 144 (2001).

Tendrillous lianes climbing to 30 m; stem terete; slash pink; latex abundant in all parts; spines absent. **Leaves** elliptic or ovate, glabrous; petiolate; stipules absent. **Inflorescences** terminal, many-flowered paniculate cymes forming large dense heads, or lax and tendrillous. **Flowers** large, white, very sweetly scented. **Calyx**: lobes imbricate, free to base. **Corolla** hypocrateriform; tube cylindric, slightly enlarged at level of anthers, pilose within, especially towards mouth; lobes contorted, overlapping to the left, \pm elliptic, shorter or longer than tube. **Stamens** inserted below middle of corolla tube; anthers subsessile, without carina. **Ovary** with a ring of stiff erect hairs at apex; style glabrous, clavuncle linear-fusiform, stigma not quite attaining level of anthers. **Fruit** a many-seeded glabrous berry with sclerified pericarp.

Species 3, African, one extending to Madagascar and the Comores; sthn trop. Afr. 1: *Saba comorensis* (Bojer) Pichon, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Sarcostemma R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 504 (1957); Liede & Meve: 223 (1992); Liede: 31 (1996d); Liede & Täuber: 133 (2000); Bruyns: 433 (2003); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Schizostephanus Hochst. ex Benth. & Hook.f.

(Asclepiadoideae—Asclepiadeae)

Liede: 92 (1994); Liede & Albers: 215 (1994).

Cynanchum, in part; Brown: 390 (1902/1903); Liede: 537 (1993).

Erect to scrambling perennials; shoots perennial, herbaceous to succulent, woody at base, glabrous. **Leaves** opposite, petiolate, with colleters at base; lamina glabrous, broadly ovate, base lobed, apex acute. **Inflorescence** botrychoid cymose, sometimes basally dichasial, 15–30-flowered; flowers small. **Sepals** fused at base; lobes ovate-acute, abaxially glabrous. **Corolla** rotate, 5-lobed nearly to base, adaxially with very

long slender trichomes, abaxially glabrous; lobes oblong, obtuse, decurved. **Corona** tubular, terminating in 10 teeth, longer than gynostegium; staminal and interstaminal corona equally long but largely fused. **Gynostegium** borne on a long slender stipe. **Anthers** trapezoid; anther wings vaguely differentiated, basally widening; pollinia clavate, attached along a dorsal rim. **Follicles** ellipsoid, smooth, glabrous. **Seeds** pyriform, with entire marginal wing and a tuft of hairs.

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr. Endress & Bruyns (2000) do not list this genus. They presumably consider it a synonym of *Cynanchum*.

Schizogygia Baill.

(Rauvolfioideae—Tabernaemontaneae)

Baillon: 752 (1888); Barink: 447 (1985); White *et al.*: 144 (2001).

Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in each fork; with white latex; branchlets terete. **Leaves** opposite, those of a pair equal, petiolate, with 1 or 2 rows of colleters in axils; lamina obovate, cuneate at base. **Inflorescences** corymbose, congested. **Flowers** regular except for the sometimes slightly unequal sepals. **Calyx** green; sepals free, subequal, entire. **Corolla** with tube yellow and limb creamy to yellow; tube slightly shorter to much longer than calyx; lobes in bud overlapping to the right, spreading. **Stamens** included or nearly so; anthers sessile, narrowly triangular, acute at apex, sagittate at base, glabrous or sometimes papillose, introrse, with upper $\frac{2}{3}$ fertile. **Ovary** glabrous or nearly so, subglobose, composed of 2 free carpels; disc adnate to ovary for $\pm \frac{7}{10}$ of its height; clavuncula cylindric; stigma minute, 2-lobed. **Fruit** composed of 2 almost free adaxially dehiscent carpels, wall thinly coriaceous, irregularly striate, grooved when dry. **Seeds** few, surrounded by a thin red or orange pulpy aril, obliquely ellipsoid, with a deep groove to $\frac{1}{2}$ their width at hilar side and shallowly grooved at other sides, minutely rugose; endosperm copious, starchy, white, ruminant, surrounding spatulate embryo.

Monotypic: *Schizogygia coffaeoides* Baill., Africa; sthn trop. Afr.: Angola, Malawi.

Schlechterella K.Schum.

(Periplocoideae)

Schumann: 462 (1899); Venter & Verhoeven: 350 (1998); Venter & Verhoeven: 564 (2001).

Climbers with white latex; roots tuberous; stems subterranean and aerial: subterranean stems perennial, sprouting from top of root tuber; aerial stems annual or perennial, twining, with interpetiolar, purplish maroon, acicular colleters. **Leaves** opposite or fascicled, sessile to petiolate, simple; blade linear to narrowly obovate, entire, sometimes undulate. **Inflorescences** axillary and terminal, cymose with monochasial branches; bracteate. **Flowers** regular, bisexual, pentamerous; gynostegium exerted from corolla mouth. **Sepals** free, narrowly triangular or narrowly ovate, with paired colleters at their inner bases. **Corolla** glabrous; tube campanulate; lobes linear to very narrowly ovate or obovate. **Corona** corolline, double; outer corona at mouth of corolla tube, 5 lobes basally fused into an annular tube, lobes antesealous, with segmented apices; inner corona of 5 free interstaminal discs. **Stamens** 5, epipetalous, directly below outer corona lobes, free, glabrous;

filaments filiform; anthers basally fused to stigmatic head and conniving in a cone above it, glabrous, connective apically short, acute, pollinia subreniform. **Ovaries** 2, half-inferior, many-ovuled; styles basally free, apically fused; stigmatic head broadly pentagonal-deltoid with obtuse apex; pollen translators with receptacle oblong-ovate to oblong-elliptic, folded scoop-shaped, stipe terete, adhesive disc subcircular. **Follicles** paired, horizontally divergent, very narrowly ovoid with acuminate apex.

Species 2, eastern Africa from Ethiopia to Mozambique; sthn trop. Afr. 1: *Schlechterella africana* (Schltr.) K.Schum., Mozambique.

Secamone R.Br.

(Secamonoideae)

Bullock: 362 (1953b); Bullock: 368 (1954); Binns: 22 (1968); Goyder: 437 (1992); Klackenber: 317 (2001); White *et al.*: 165 (2001).

Toxocarpus Wight & Arn., in part; Brown: 286 (1902/1903); Norman & Moore: 93 (1929); Bullock: 193 (1961); Bullock: 88 (1963).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sisyranthus E.Mey.

(Asclepiadoideae—Ceropegieae)

Weimarck: 402 (1935); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Sisyranthus rhodesicus* Weim., Zimbabwe, and sthn Afr.

Sphaerocodon Benth.

(Asclepiadoideae—Asclepiadeae)

Brown: 773 (1907–1909); Norman & Moore: 97 (1929); Weimarck: 401 (1935); Binns: 22 (1968).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Stapelia L.

(Asclepiadoideae—Ceropegieae)

Binns: 22 (1968); Kers: 173 (1969); Leach: 1 (1985); Kimberley: 62 (1986); De Kock: 8 (2001b).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stathmostelma K.Schum.

(Asclepiadoideae—Asclepiadeae)

Bullock: 51 (1953a); Bullock: 342 (1953b); Bullock: 195 (1961); Goyder: 577 (1998b).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stenostelma Schltr.

(Asclepiadoideae—Asclepiadeae)

Bullock: 417 (1952); Bullock: 342 (1953b).

Sthn trop. Afr. 1: *Stenostelma eminens* (Harv.) Bullock, Zimbabwe, and sthn Afr.

Stomatostemma N.E.Br.

(Periplocoideae)

Venter & Verhoeven: 50 (1993).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Strophanthus DC.

(Apocynoideae—Wrightieae)

Beentje: (1982); Beentje: 468 (1985); White *et al.*: 146 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 962 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tabernaemontana L.

(Rauvolfioideae—Tabernaemontaneae)

Leeuwenberg: 383 (1978); Leeuwenberg: 438 (1985a); Leeuwenberg: 1 (1991); White *et al.*: 146 (2001); Coates Palgrave: 952 (2002).

Conopharyngia G.Don; Burt Davy *et al.*: 26 (1958). *Gabunia* K.Schum. ex Stapf; Good: 87 (1929).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tabernanthe Baill.

(Rauvolfioideae—Tabernaemontaneae)

Stapf: 122 (1902); Norman & Moore: 86 (1929); Hürlimann: 487 (1957); Bullock: 395 (1962a).

Daturicarpa Stapf: 166 (1921); Hürlimann: 487 (1957).

Shrubs or small trees, dichotomously branched, with milky latex. **Leaves** opposite, herbaceous, broadly elliptic to elliptic-oblong, acuminate; stipules absent, but filiform colleters often many. **Flowers** small, in terminal or pseudo-axillary, subcorymbose or umbelliform, minutely bracteate inflorescences. **Calyx** deeply 5-partite; sepals rotundate-ovate, acute, the inner with 1 or 2 glands at base, persistent and reflexed in fruit. **Corolla**: tube subcylindric; lobes obliquely subrotundate. **Stamens** arising at middle of tube; filaments very short, stout; anthers conniving in a cone, with acute tails. **Disc** absent. **Ovary** syncarpous, imperfectly 2-celled; style filiform; stigma capitate, 5-grooved, with a 2-fid slender apiculus. **Fruit** baccate, fleshy, ovoid, acuminate. **Seeds** few, ellipsoid, embedded in scanty pulp.

Species 2, central trop. Africa; sthn trop. Afr. 1: *Tabernanthe iboga* Baill., Angola.

Tacazzea Decne.

(Periplocoideae)

Bullock: 350 (1954); Venter *et al.*: 93 (1990); Venter & Verhoeven: 566 (2001); White *et al.*: 165 (2001).

Zacateza Bullock: 361 (1954).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tavaresia Welw.

(Asclepiadoideae—Ceropegieae)

Leach: 349 (1974); Kimberley: 62 (1986); Jonkers: 15 (1999); Van Jaarsveld & Nagel: 9 (1999); De Kock: 9 (2001b); Mapaura & Timberlake: 162 (2002).

Decabelone Decne.; Bullock: 508 (1961).

Sthn trop. Afr. 3, Angola, Zimbabwe, and sthn Afr.

Telosma Coville

(Asclepiadoideae—Marsdenieae)

Brown: 775 (1907–1909); Bullock: 97 (1963); Liede: 63 (1990).

Pergularia in the sense of R.Br., in part; Brown: 426 (1903); Binns: 21 (1968).

Sthn trop. Afr. 1: *Telosma africanum* (N.E.Br.) Coville, Zimbabwe, Malawi, and sthn Afr.

Trachycalymma (K.Schum.) Bullock

(Asclepiadoideae—Asclepiadeae)

Bullock: 348 (1953b); Bullock: 620 (1956); Binns: 22 (1968) as *Trachycalymma*; Goyder: 129 (2001).

Perennial herbs with annual stems arising from tuberous rootstocks; stems usually single, erect, mostly unbranched, densely pubescent with spreading white hairs; latex milky. **Leaves** opposite, sessile or petiolate; lamina linear to lanceolate, oblong or ovate, pubescent or subglabrous, margins pubescent. **Inflorescences** extra-axillary, pedunculate, umbellate; flowers mostly nodding. **Calyx** lobed to base. **Corolla** campanulate, or occasionally reflexed. **Corona**: staminal corona lobes diverse, but always arising from base of staminal column and adnate to it by their entire length, weakly to strongly cucullate, frequently somewhat pouched, with or without a laterally flattened tooth within cavity of lobe. **Anther**: appendages inflexed over apex of stigma head. **Pollinaria** with flattened and geniculate translator arms, mostly with a clasping overlap to the pollinia; pollinia flattened, obovate to obtriangular. **Follicles** erect, narrowly fusiform to ovoid, not inflated, densely pubescent, at least when young; fruiting pedicel contorted or not. **Seeds** flattened or somewhat convex, ovate, comose.

Species 10, trop. Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Tylophora R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 579 (1955a); Bullock: 624 (1956); White: 360 (1962); Liede: 193 (1996b); White *et al.*: 166 (2001).

Tylophoropsis N.E.Br.; Liede: 93 (1994).

Sthn trop. Afr. 4, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Vahadenia Stapf

(Rauvolfioideae—Willughbeieae)

Haegens: 320 (1994); Endress & Bruyns: 35 (2000).

Lianas up to 30 m high climbing in trees; white latex present in all parts; branches with many lenticels. **Leaves** opposite, petiolate, entirely glabrous, obovate to elliptic. **Inflorescences** lax cymes, axillary or terminal, few- to many-flowered. **Flowers** 5-merous, white, reddish at base, sweet-scented. **Calyx** green, ciliate, otherwise glabrous, with many colleters in several rows at base. **Corolla** glabrous except for a tuft of hairs inside at base of lobes; tube almost cylindrical, 1.5–4.1 times as long as sepals; lobes as long as to longer than tube, narrowly

obovate, with 1 longitudinal groove outside. **Stamens** arising \pm in middle of corolla tube; filaments glabrous, white; anthers narrowly ovate to cordate. **Ovary** cylindrical, abruptly narrowing into style, pubescent in upper half, style glabrous, style head conical from a thickened base, minutely 2-lobed at level of anthers. **Fruit** syncarpous, globose, pear-shaped or obovoid; pulp orange. **Seeds** 10–40, ellipsoid, laterally compressed; testa thin; endosperm thick, white; cotyledons ellipsoid, undulate; embryo very small.

Species 2, trop. Africa; sthn trop. Afr. 1: *Vahadenia laurentii* (De Wild.) Stapf, Angola.

Voacanga Thouars

(Rauvolfioideae—Tabernaemontaneae)

White: 352 (1962); Leeuwenberg: 434 (1985a); Leeuwenberg: 5 (1985c); Leeuwenberg: 1011 (1987); Endress & Bruyns: 35 (2000); White *et al.*: 148 (2001); Coates Palgrave: 955 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wrightia R.Br.

(Apocynoideae—Wrightieae)

Leeuwenberg: 480 (1985a); White *et al.*: 150 (2001); Coates Palgrave: 964 (2002).

Sthn trop. Afr. 1: *Wrightia natalensis* Stapf, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Xysmalobium R.Br.

(Asclepiadoideae—Asclepiadeae)

Brown: 298 (1902/1903); Norman & Moore: 94 (1929); Bullock: 413 (1952); Bullock: 353 (1953b); Binns: 23 (1968).

Sthn trop. Afr. \pm 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- BAILLON, H.E. 1888. *Pleioceras*, *Schizozygia*. *Bulletin mensuel de la Société Linnéenne de Paris* 1: 759, 752.
- BARINK, M.M. 1985. See Leeuwenberg & Kupicha *et al.* 1985.
- BARINK, M.M. 1987. *Pleioceras gillettii* Stapf, *P. orientale* Vollesen. *Distributiones plantarum africanarum* 30: 1004, 1005.
- BEENTJE, H.J. 1978. A revision of *Callichilia* Stapf (Apocynaceae). *Mededelingen van de Landbouwhogeschool Wageningen* 78, 7: 1–32.
- BEENTJE, H.J. 1982. A monograph on *Strophanthus* DC. (Apocynaceae). *Mededelingen van de Landbouwhogeschool Wageningen* 82, 4: 1–191.
- BEENTJE, H.J. 1985. See Leeuwenberg & Kupicha *et al.* 1985.
- BENTHAM, G. 1849. *Clitandra*. In: W.J. Hooker, *Niger Flora*. Baillière, London.
- BENTHAM, G. 1876. *Pleiocarpa*. In: G. Bentham & J.D. Hooker, *Genera plantarum* 2. Reeve, London.
- BINGHAM, M.G. (Unpublished). Preliminary national check list of Zambia (August 1999). Unpublished manuscript. SABONET, Pretoria.
- BINGHAM, M.G. & SMITH, P.P. 2002. Zambia. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 135–156. SABONET, Pretoria.
- BINNS, B. 1968. *A first check list of the herbaceous flora of Malawi*. Government Printer, Zomba, Malawi.
- BOELE, C. 1988. Preliminary list of the Stapelieae of Zambia. *Asklepios* 42: 37–43.

- BOELE, C. 1993. Three new species of *Brachystelma* Sims (Asclepiadaceae) from Zimbabwe. *Excelsa* 16: 29–33.
- BROWN, N.E. 1896. *Batesanthus purpureus* N.E. Brown. *Curtis's Botanical Magazine* 25: t. 2500.
- BROWN, N.E. 1902/1903. Asclepiadaceae. *Flora of tropical Africa* 4(1): 231–503.
- BROWN, N.E. 1907. The genus *Pergularia*. *Kew Bulletin (Bulletin of Miscellaneous Information, Kew)* 1907: 323–325.
- BROWN, N.E. 1907–1909. Asclepiadaceae. *Flora capensis* 4(1): 518–1036.
- BROWN, R. 1810. On the Asclepiadaceae, a natural order of plants separated from the Apocineae of Jussieu. *Memoirs of the Wernerian Natural History Society* 1: 64.
- BRUYNS, P. 1988. Studies in the flora of Arabia XXI: *Cibirhiza*, a new genus of Asclepiadaceae from Oman. *Notes from the Royal Botanic Garden Edinburgh* 45: 51–54.
- BRUYNS, P. 1993. A revision of *Hoodia* and *Lavrana* (Asclepiadaceae—Stapelieae). *Botanische Jahrbücher* 115: 145–270.
- BRUYNS, P. 1995. New records and new species of Asclepiadaceae from Namibia. *Bothalia* 25(2): 155–172.
- BRUYNS, P. 2000a. Phylogeny and biogeography of the stapeliads. 1. Phylogeny. *Plant Systematics and Evolution* 221(3–4): 199–226.
- BRUYNS, P. 2000b. Phylogeny and biogeography of the stapeliads. 2. Biogeography. *Plant Systematics and Evolution* 221(3–4): 227–244.
- BRUYNS, P. 2000c. New combinations in the genus *Orbea*. *Aloe* 37(4): 72–76.
- BRUYNS, P. 2003. Three new succulent species of Apocynaceae (Asclepiadoideae) from southern Africa. *Kew Bulletin* 58(2): 427–435.
- BULLOCK, A.A. 1952. Notes on African Asclepiadaceae. I. *Kew Bulletin* 7 (1952): 405–426.
- BULLOCK, A.A. 1953a. Notes on African Asclepiadaceae. II. *Kew Bulletin* 8 (1953): 51–67.
- BULLOCK, A.A. 1953b. Notes on African Asclepiadaceae. III. *Kew Bulletin* 8 (1953): 329–362.
- BULLOCK, A.A. 1954. Notes on African Asclepiadaceae. IV. *Kew Bulletin* 9 (1954): 349–373.
- BULLOCK, A.A. 1955a. Notes on African Asclepiadaceae. V. *Kew Bulletin* 9 (1954): 579–594.
- BULLOCK, A.A. 1955b. Notes on African Asclepiadaceae. VI. *Kew Bulletin* 10 (1955): 265–292.
- BULLOCK, A.A. 1956. Notes on African Asclepiadaceae. VII. *Kew Bulletin* 10 (1955): 611–626.
- BULLOCK, A.A. 1957. Notes on African Asclepiadaceae. VIII. *Kew Bulletin* 11 (1956): 503–522.
- BULLOCK, A.A. 1961. Notes on African Asclepiadaceae. IX. *Kew Bulletin* 15: 193–206.
- BULLOCK, A.A. 1962a. Nomenclatural notes: XV. *Kew Bulletin* 15: 389–396.
- BULLOCK, A.A. 1962b. *Pentagonanthus grandiflorus* (N.E.Br.) Bullock. *Hooker's Icones Plantarum* 36: t. 3583.
- BULLOCK, A.A. 1963. Periplocaceae & Asclepiadaceae. *Flora of west tropical Africa*, edn 2, 2: 80–103.
- BURTT DAVY, J. & HOYLE, A.C. (eds) & TOPHAM, P. (reviser). 1958. *Check list of the forest trees and shrubs of the Nyasaland Protectorate*. Government Printer, Zomba, Malawi.
- CANDOLLE, A.L. 1844. *Prodromus* 8. Treuttel & Würtz, Paris.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- CODD, L.E. 1963. Apocynaceae. *Flora of southern Africa* 26: 244–296.
- COURT, G.D. 1987 *Fockea* Endl.—An African genus. *Asklepios* 40: 69–74.
- DE HOOGH, B. 1989. *Dictyophleba* Pierre. Series of revisions of Apocynaceae XXVIII. *Bulletin du Jardin Botanique de Belgique* 59: 207–226.
- DE JONG, B.H.J. 1979. A revision of the African species of *Alstonia* R.Br. (Apocynaceae). *Mededelingen Landbouwhogeschool Wageningen* 79, 13: 1–16.
- DE JONG, B.H.J. 1986. *Alstonia boonei* De Wild., *A. congensis* Engl. *Distributiones plantarum africanarum* 29: 985, 986.
- DE KOCK, D. 2000a. Views on the Stapeliads: The complete check list of the Stapeliads (Ceropegieae: Asclepiadoideae)—Part 1. *Asklepios* 80: 29–36.
- DE KOCK, D. 2000b. Views on the Stapeliads: The complete check list of the Stapeliads (Ceropegieae: Asclepiadoideae)—Part 2. *Asklepios* 81: 28–32.
- DE KOCK, D. 2001a. Views on the Stapeliads: The complete check list of the Stapeliads (Ceropegieae: Asclepiadoideae)—Part 3. *Asklepios* 82: 31–36.
- DE KOCK, D. 2001b. Views on the Stapeliads: The complete check list of the Stapeliads (Ceropegieae: Asclepiadoideae)—Part 4. *Asklepios* 82: 4–12.
- DE KRUIF, A.P.M. 1985a. See Leeuwenberg & Kupicha *et al.* 1985.
- DE KRUIF, A.P.M. 1985b. A revision of *Oncinotis* Benth. (Apocynaceae). Part XVI. In: A.J.M. Leeuwenberg, Series of revisions of Apocynaceae XVI–XVIII. *Agricultural University Wageningen Papers* 85, 2: 5–45.
- DE KRUIF, A.P.M. 1986. *Holarrhena floribunda* (G. Don) T. Durand & Schinz, *H. congolensis* Stapf, *Motandra guineensis* (Thonn.) A. DC., *M. lujaei* De Wild. & T. Durand, *Oncinotis glabrata* (Baill.) Stapf ex Hiern, *O. gracilis* Stapf. *Distributiones plantarum africanarum* 29: 969, 971, 973, 974, 977, 978.
- DYER, R.A. 1980. Asclepiadaceae. *Brachystelma*, *Ceropegia*, *Riocreuxia*. *Flora of southern Africa* 27(4): 1–91.
- DYER, R.A. 1983. *Ceropegia*, *Brachystelma* and *Riocreuxia* in southern Africa. A.A. Balkema, Rotterdam.
- ENDRESS, M.E. 2001. Apocynaceae and Asclepiadaceae: united they stand. *Haseltonia* 8: 2–9.
- ENDRESS, M.E. & BRUYNS, P. 2000. A revised classification of the Apocynaceae s. l. *The Botanical Review* 66: 1–56.
- FIELD, D., FRIIS, I. & GILBERT, M.G. 1986. A new species of *Kanahia* (Asclepiadaceae) with a reconsideration of the genus. *Nordic Journal of Botany* 6: 787–792.
- FOSTER, P.I. 1995. Circumscription of *Marsdenia* (Asclepiadaceae: Marsdenieae), with a revision of the genus in Australia and Papuaia. *Australian Systematic Botany* 8: 703–933.
- GILBERT, M.G. 1990. A review of *Caralluma* R.Br. and its segregates. *Bradleya* 8: 1–32.
- GOOD, R. 1929. Apocynaceae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67, Supplement 1, Gamopetalae: 81–90.
- GOYDER, D.J. 1992. *Secamone* (Asclepiadaceae subfam. Secamonoideae) in Africa. *Kew Bulletin* 47: 437–474.
- GOYDER, D.J. 1995. Notes on the African genus *Glossostelma* (Asclepiadaceae). *Kew Bulletin* 50: 527–555.
- GOYDER, D.J. 1997. The status and generic position of *Pachycarpus fulvus* (N.E.Br.) Bullock. *Kew Bulletin* 52: 247–248.
- GOYDER, D.J. 1998a. A revision of *Pachycarpus* E.Mey. (Asclepiadaceae: Asclepiadeae) in tropical Africa with notes on the genus in southern Africa. *Kew Bulletin* 53: 335–374.
- GOYDER, D.J. 1998b. A revision of the African genus *Stathmostelma* K.Schum. (Apocynaceae: Asclepiadeae). *Kew Bulletin* 53: 577–616.
- GOYDER, D.J. 1998c. Additional notes on *Pachycarpus* E.Mey. in tropical Africa. *Kew Bulletin* 53: 882.
- GOYDER, D.J. 2001. A revision of the tropical African genus *Trachycalymma* (K.Schum.) Bullock (Apocynaceae: Asclepiadoideae). *Kew Bulletin* 56: 129–161.
- GOYDER, D.J. & NICHOLAS, A. 2001. A revision of *Gomphocarpus* R.Br.

- (Apocynaceae: Asclepiadeae) *Kew Bulletin* 56: 769–836.
- HAEGENS, R.M.A.P. 1994. Revision of *Cylindropsis* Pierre and *Vahadenia* Stapf. Series of revisions of Apocynaceae XXXV. *Bulletin du Jardin Botanique National de Belgique* 62: 313–328.
- HALLÉ, N. 1971. *Criocerac dipladeniiflorus* (Stapf) K.Schumann, Apocynacée du Gabon et du Congo. *Adansonia*, sér. 2, 11(2): 301–308.
- HUBER, H. 1957. Revision der Gattung *Ceropegia*. *Memórias da Sociedade Broteriana* 12: 1–203 + 16 tables.
- HUBER, H. 1963. Apocynaceae. *Flora of west tropical Africa*, edn 2, 2: 51–80.
- HÜRLIMANN, H. 1957. *Tabernaemontana* H.Baill. et *Daturicarpa* Stapf. *Berichte der Schweizerischen Botanischen Gesellschaft* 67: 487–505.
- JONKERS, H.A. 1999. Letter to the editor. *Asklepios* 77: 15.
- KERS, L.E. 1969. New and little known Stapeliads from Southern Angola. *Botaniska Notiser* 122: 172–182.
- KIMBERLEY, M.J. 1986. A check list of Zimbabwean stapeliads. *Excelsa* 12: 59–70.
- KLACKENBERG, J. 2001. Notes on Secamonoideae (Apocynaceae) in Africa. *Adansonia*, sér. 3, 23(2): 317–335.
- KOCH, I., BITTRICH, V. & KINOSHITA, L.S. 2002. Reproductive biology and functional aspects of the floral morphology of *Rauvolfia sellowii* Müll.Arg. (Apocynaceae; Rauvolfioideae)—a report of dioecy in Apocynaceae. *Botanische Jahrbücher* 124: 83–104.
- KUNZE, H., MEVE, U. & LIEDE, S. 1994. *Cibirhiza albersiana*, a new species of Asclepiadaceae, and establishment of the tribe Fockeeae. *Taxon* 43: 367–376.
- KUPICHA, F.K. 1984. Studies on African Asclepiadaceae. *Kew Bulletin* 38: 599–672.
- KUPICHA, F.K. 1985. See Leeuwenberg & Kupicha *et al.* 1985.
- LEBRUN, J.-P. & STORK, A.L. 1997. Énumération des plantes à fleurs d'Afrique tropicale 4. Conservatoire et Jardin botaniques de la Ville de Genève.
- LEACH, L.C. 1974. Stapelieae from South Tropical Africa. *Kirkia* 9(2): 349–358.
- LEACH, L.C. 1975. The lectotype species of *Stapelia* L. and the reinstatement of *Orbea* Haw. (Asclepiadaceae). *Kirkia* 10: 287–291.
- LEACH, L.C. 1985. A revision of *Stapelia* L. (Asclepiadaceae). *Excelsa. Taxonomic series* 3: 1–157.
- LEACH, L.C. 1988. A revision of *Huernia* R.Br. (Asclepiadaceae). *Excelsa. Taxonomic series* 4: 1–197.
- LEEUWENBERG, A.J.M. 1978. The Apocynaceae of Africa. I: *Tabernaemontana* L. I. Introductory remarks to a revision of the species represented in Africa. *Belmontia* n. s. 9, 37: 383–392.
- LEEUWENBERG, A.J.M. 1985a. See Leeuwenberg & Kupicha *et al.* 1985.
- LEEUWENBERG, A.J.M. 1985b. A revision of *Carvalhoa* K.Schum. Part XVII. In: A.J.M. Leeuwenberg, Series of revisions of Apocynaceae XVI–XVIII. *Agricultural University Wageningen Papers* 82, 2: 47–55.
- LEEUWENBERG, A.J.M. 1985c. *Voacanga* Thou. In: A.J.M. Leeuwenberg, Series of revisions of Apocynaceae XV. *Agricultural University Wageningen Papers* 85, 3: 5–80.
- LEEUWENBERG, A.J.M. 1987. *Voacanga chalongiana* Pierre ex Stapf. *Distributiones plantarum africanarum* 30: 1011.
- LEEUWENBERG, A.J.M. 1991. *A revision of Tabernaemontana L. I. The Old World species*. Royal Botanic Gardens, Kew.
- LEEUWENBERG, A.J.M. 1997. Series of revisions of Apocynaceae XLIII. *Alafia* Thouars. *Kew Bulletin* 52(4): 769–839.
- LEEUWENBERG, A.J.M. 2001. Series of revisions of Apocynaceae L. Key to Apocynaceae in continental Africa. *Wageningen University Papers* 2001, 1: 111–121.
- LEEUWENBERG, A.J.M. & BERNDSEN, M. 1988. *Clitandra* Benth. and *Chamaelitandra* (Stapf) Pichon. Series of revisions of Apocynaceae XXV. *Bulletin du Jardin Botanique National de Belgique* 58: 159–168.
- LEEUWENBERG, A.J.M. & KUPICHA, F.K. *et al.* 1985. Apocynaceae. *Flora zambesiaca* 7(2): 395–503.
- LEEUWENBERG, A.J.M. & VAN DILST, F.J.H. 1989. *Saba* (Pichon) Pichon. Series of revisions of Apocynaceae XXVI. *Jardin Botanique National de Belgique* 59: 189–206.
- LEEUWENBERG, A.J.M. & VAN DILST, F.J.H. 2001. Series of revisions of Apocynaceae XLIX. *Carissa* L. *Wageningen University Papers* 2001, 1: 3–109, 123–126.
- LIEDE, S. 1990. *Daemia—Pergularia—Telosma*: a nomenclatural confusion. *Asklepios* 51: 63–68.
- LIEDE, S. 1993. A taxonomic revision of the genus *Cynanchum* L. (Asclepiadaceae) in southern Africa. *Botanische Jahrbücher* 114(4): 503–550.
- LIEDE, S. 1994. Myth and reality of the subtribe Astephaninae (Decne.) Schumann (Asclepiadaceae). *Botanical Journal of the Linnean Society* 114: 81–98.
- LIEDE, S. 1996a. A revision of *Cynanchum* (Asclepiadaceae) in Africa. *Annals of the Missouri Botanical Garden* 83: 283–345.
- LIEDE, S. 1996b. *Cynanchum—Rhodostegiella—Vincetoxicum—Tylophora* (Asclepiadaceae): new considerations on an old problem. *Taxon* 45: 193–211.
- LIEDE, S. 1996c. On the position of the genus *Pergularia* (Asclepiadaceae). In: L.J.G. van der Maesen *et al.* (eds), *The biodiversity of African plants*, 481–488. Kluwer Academic Publishers, Dordrecht, etc.
- LIEDE, S. 1996d. *Sarcostemma* (Asclepiadaceae)—a controversial generic circumscription reconsidered: morphological evidence. *Systematic Botany* 21(1): 31–44.
- LIEDE, S. & ALBERS, F. 1994. Tribal disposition of genera in the Asclepiadaceae. *Taxon* 43: 201–231.
- LIEDE, S. & KUNZE, H. 1993. A descriptive system for corona analysis in Asclepiadaceae and Periploceae. *Plant Systematics and Evolution* 185: 275–284.
- LIEDE, S. & MEVE, U. 1992. A new species of *Sarcostemma* (Asclepiadaceae) from Malawi. *Novon* 2: 223–226.
- LIEDE, S. & NICHOLAS, A. 1992. A revision of the genus *Pentarrhinum* E.Meyer (Asclepiadaceae). *Kew Bulletin* 47: 475–490.
- LIEDE, S. & TÄUBER, A. 2000. *Sarcostemma* R.Br. (Apocynaceae—Asclepiadoideae)—a controversial generic circumscription reconsidered: evidence from *trnL*-F spacers. *Plant Systematics and Evolution* 225: 133–140.
- LISOWSKI, S. & MALAISSE, F. 1974. Le genre *Ceropegia* L. (Asclepiadaceae) au Shaba (Zaire). *Bulletin du Jardin Botanique National de Belgique* 44: 401–418.
- MAPAURA, A. (Unpublished). Check list of the vascular plants of Zimbabwe. Unpublished manuscript. SABONET, Pretoria.
- MAPAURA, A. & TIMBERLAKE, J.R. 2002. Zimbabwe. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 157–182. SABONET, Pretoria.
- MARLOTH, R. 1987. *Fockea*. *Asklepios* 40: 67–68. [Extracted from *The Flora of South Africa* 3 (1932)].
- MARTINS, E.S. 1994. John Gossweiler. Contribuição da sua obra para o conhecimento da flora angolana. *Garcia de Orta, sér. Botânica* 12(1 & 2): 39–68.
- MASINDE, P.S. & MEVE, U. 2002. *Ceropegia zambesiaca* (Apocynaceae: Asclepiadoideae-Ceropegieae), a new species from Zambia. *Kew Bulletin* 57: 205–209.
- MEVE, U. 1995. *Neoschumannia* (including *Swynnertonia*), a primitive genus of the Asclepiadaceae-Stapelieae. *Plant Systematics and Evolution* 197: 233–242.
- MEVE, U. 1997. *The genus Duvalia (Stapelieae): stemsucculents between the Cape and Arabia*. Springer-Verlag, Wien, New York.
- MEVE, U. 2002a. Species numbers and progress in asclepiad taxonomy.

- Kew Bulletin* 57(2): 459–464.
- MEVE, U. 2002b. *Brachystelma*. In: F. Albers & U. Meve (eds), *Illustrated handbook of succulent plants: Asclepiadaceae*: 20–46. Springer, Berlin etc.
- MEVE, U. 2002c. *Ceropegia*. In: F. Albers & U. Meve (eds), *Illustrated handbook of succulent plants: Asclepiadaceae*: 63–107. Springer, Berlin etc.
- MEVE, U. 2002d. *Cibirhiza*. In: F. Albers & U. Meve (eds), *Illustrated handbook of succulent plants: Asclepiadaceae*: 107–108. Springer, Berlin etc.
- MEVE, U. & LIEDE, S. 1996. *Sarcostemma* R.Br. (Asclepiadaceae) in East Africa and Arabia. *Botanical Journal of the Linnean Society* 120: 21–38.
- MEVE, U. & LIEDE, S. 2001. Inclusion of *Tenaris* and *Macropetalum* in *Brachystelma* (Apocynaceae-Asclepiadoideae-Ceropegieae) inferred from non-coding nuclear and chloroplast DNA sequences. *Plant Systematics and Evolution* 228: 89–105.
- MEYER, E.H.F. 1838. *Commentariorum de plantis Africae australioris*. Voss, Leipzig.
- MÜLLER, B., STEGEMANN, P. & ALBERS, F. 2002. *Aspidoglossum*. In: F. Albers & U. Meve (eds), *Illustrated handbook of succulent plants: Asclepiadaceae*: 10–18. Springer, Berlin etc.
- MWANYAMBO, M.L. 1996. Intraspecific variation in the African genus *Margaretta* (Asclepiadaceae: Asclepiadoideae). *Kew Bulletin* 51: 717–728.
- NEWTON, L.E. 1996. The genus *Brachystelma* (Asclepiadaceae) in East Africa, with a new record and description of a new species. *Bradleya* 14: 94–98.
- NORMAN, C. & MOORE, S. 1929. Asclepiadaceae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67, Supplement 1, Gamopetalae: 91–100.
- OLIVER, D. 1887. *Chlorocyathus monteiroae* Oliv. *Hooker's Icones Plantarum* 16: t. 1557.
- OMINO, E. 1996. A contribution to the leaf anatomy and taxonomy of Apocynaceae in Africa. *Belmontia* 29, n. s. 174: 1–176.
- OMINO, E. 2002. *Flora of tropical east Africa*. Apocynaceae (Part 1): 1–114.
- PECKOVER, R. 1996. *Brachystelma richardsii*, a new species from Zimbabwe. *Excelsa* 17: 33–34.
- PECKOVER, R. 1997. *Brachystelma albipilosum*, a new dwarf species from Zimbabwe. *Cactus and Succulent Journal (U.S.)* 69: 154–156.
- PERCY-LANCASTER, A. 1988. *Brachystelma* in Zimbabwe. *Excelsa* 13: 63–77.
- PERSOON, J.G.M., VAN DILST, F.J.H., KUIJPERS, R.P., LEEUWENBERG, A.J.M. & VONK, G.J.A. 1992. The African species of *Landolphia* P.Beauv. Series of revisions of Apocynaceae XXXIV. *Wageningen Agricultural University Papers* 92, 2: 1–232.
- PHIRI, P.S.M. (Unpublished). A check list of Zambian vascular plants. Unpublished manuscript. SABONET, Pretoria.
- PICHON, M. 1953a. Classification des Apocynacées: XXXVI. Révision des Pléiocarpinées. *Boletim da Sociedade Broteriana*, sér. 2, 27: 73–153.
- PICHON, M. 1953b. *Saba*. *Mémoires de l'Institut Français d'Afrique Noire* 35: 302.
- PICHON, M. 1954. Classification des Apocynacées: XXXIX. Révision du genre *Alafia* Thou. *Bulletin du Jardin Botanique de l'État, Bruxelles* 24: 129–222.
- PIERRE, J.B.L. 1896. *Picralima*. *Bulletin mensuel de la Société Linnéenne de Paris* 2: 1278.
- PIERRE, J.B.L. 1897. *Crioceras*. *Bulletin mensuel de la Société Linnéenne de Paris* 2: 1311.
- PIERRE, J.B.L. 1898. *Cylindropsis*, *Dictyophleba*. *Bulletin mensuel de la Société Linnéenne de Paris*, sér. 2: 38, 92.
- PLAIZIER, A.C. 1985. See Leeuwenberg & Kupicha *et al.* 1985.
- PLOWES, D. 1996. *Larryleachia* and *Hoodia* (Stapelieae: Asclepiadaceae): some nomenclatural proposals. *Excelsa* 17: 3–28.
- RAHMAN, M.A. & WILCOCK, C.C. 1991. A taxonomic revision of *Calotropis* (Asclepiadaceae). *Nordic Journal of Botany* 11(3): 301–308.
- RAPANARIVO, S.H.J.V., LAVRANOS, J.J., LEEUWENBERG, A.J.M. & RÖÖSLI, W. 1999. *Pachypodium* (Apocynaceae). *Taxonomy, habitats and cultivation*. A.A. Balkema, Rotterdam/Brookfield.
- RENDLE, A.B. 1894. Two new tropical African Asclepiadeae. *Journal of Botany* 32: 161–162 + plate 344.
- ROXBURGH, W. 1824. *Flora indica* 2. Mission Press (typ.), Serampore.
- SCHLECHTER, R. 1905. Asclepiadaceae africanae. *Botanische Jahrbücher* 38: 26–56.
- SCHUMANN, K. 1895. Apocynaceae. *Die natürlichen Pflanzenfamilien*, edn 1, 4, 2: 109–189.
- SCHUMANN, K. 1899. *Schlechterella*. *Die natürlichen Pflanzenfamilien*, edn 1. Gesamtregister zum 2. bis 4. Teil.
- SCHUMANN, K. & SCHLECHTER, R. 1900. Eine neue Gattung der Asclepiadaceae. *Botanische Jahrbücher* 29, Beiblätter 66: 21–22.
- SMITH, D.M.N. 1988. A revision of the genus *Pachycarpus* in southern Africa. *South African Journal of Botany* 54(5): 399–439.
- STAPF, O. 1899. *Funtumia*. *Proceedings of the Linnean Society of London*, Session 112: 2.
- STAPF, O. 1902. Apocynaceae. *Flora of tropical Africa* 4: 24–231.
- STAPF, O. 1921. *Daturicarpa*, a new genus of Apocynaceae. *Kew Bulletin* 1921: 166–171.
- STOPP, K. 1964. Die *Ceropegia*-Arten der Umbraticola-Gruppe. *Botanische Jahrbücher* 83(2): 115–125.
- STOPP, K. 1967. *Aidomene* nov. gen., eine neue Asclepiadacee Angolas. *Botanische Jahrbücher* 87: 17–21.
- STOPP, K. 1971. Neue *Ceropegia*-Aufsammlungen in Angola. *Botanische Jahrbücher* 90(4): 469–475.
- THOUARS, L.M.A. DU PETIT. 1806. *Genera nova madagascariensis*. Académie des Sciences, Paris.
- VAN DILST, F.J.H. 1995. *Baissea* A.DC. Series of revisions of Apocynaceae XXXIX. *Bulletin du Jardin Botanique National de Belgique* 64: 89–178.
- VAN DILST, F.J.H. & LEEUWENBERG, A.J.M. 1991. *Rauvolfia* L. in Africa and Madagascar. Series of revisions of Apocynaceae XXXIII. *Bulletin du Jardin Botanique National de Belgique* 61: 21–69.
- VAN JAARVELD, E. & NAGEL, L. 1999. *Tavaresia thompsonii* Van Jaarsveld & Nagel, a new species from S. Angola. *Asklepios* 76: 9–10.
- VENTER, H.J.T. 1997. A revision of *Periploca* (Periploceae). *South African Journal of Botany* 63(3): 123–128.
- VENTER, H.J.T. & VERHOEVEN, R.L. 1988a. *Raphionacme pulchella* (Periploceae). A new species from Mozambique and Zimbabwe. *South African Journal of Botany* 54(1): 72–74.
- VENTER, H.J.T. & VERHOEVEN, R.L. 1988b. *Raphionacme chimanimaniana* (Periploceae), a new species from Zimbabwe. *South African Journal of Botany* 54(4): 380–382.
- VENTER, H.J.T. & VERHOEVEN, R.L. 1993. A taxonomic account of *Stomatostemma* (Periploceae). *South African Journal of Botany* 59(1): 50–56.
- VENTER, H.J.T. & VERHOEVEN, R.L. 1997. A tribal classification of the Periplocoideae (Apocynaceae). *Taxon* 46: 705–720.
- VENTER, H.J.T. & VERHOEVEN, R.L. 1998. A taxonomic revision of *Schlechterella* (Periplocoideae, Apocynaceae). *South African Journal of Botany* 64(6): 350–355.
- VENTER, H.J.T. & VERHOEVEN, R.L. 2000. *Raphionacme sylvicola* (Apocynaceae, Periplocoideae), a new species from Zambia. *Novon* 10: 169–174.
- VENTER, H.J.T. & VERHOEVEN, R.L. 2001. Diversity and relationships within the Periplocoideae (Apocynaceae). *Annals of the Missouri Bo-*

- tanical Garden* 88: 550–568.
- VENTER, H.J.T., VERHOEVEN, R.L. & KOTZE, J.D.S. 1990. A monograph of *Tacazzea* (Periplocaceae). *South African Journal of Botany* 56(1): 93–112.
- VERHOEVEN, R.L. & VENTER, H.J.T. 1997. The translator of *Raphionacme* (Periplocaceae). *South African Journal of Botany* 63(1): 46–54.
- VICTOR, J.E., BREDEKAMP, C.L., VENTER, H.J.T., BRUYNS, P.V. & NICHOLAS, A. 2000. Apocynaceae (in broad sense). In: O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 71–98. National Botanical Institute, Pretoria.
- VICTOR, J.E. & NICHOLAS, A. 1998. In: defence of *Tenaris* and *Macropetalum* (Asclepiadaceae). *South African Journal of Botany* 64(3): 205–208.
- WEIMARCK, H. 1935. Asclepiadaceae. In: T. Norlindh & H. Weimarck, Beiträge zur Kenntnis der Flora von Süd-Rhodesia. III. *Botaniska Notiser* 1935: 368–408.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press, Oxford.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.
- WIGHT, R. & ARNOTT, G.A.W. 1834. *Contributions to the botany of India*. Parbury, Allen & Co., London.
- ZWETSLOOT, H.J.C. 1985. See Leeuwenberg & Kupicha *et al.* 1985.
- ZWETSLOOT, H.J.C. 1986. *Funtumia africana* (Benth.) Stapf, *F. elastica* (Preuss) Stapf. *Distributiones plantarum africanarum* 29: 966, 967.

Aquifoliaceae

(Asteridae—Aquifoliales)
(Euasterids II—Aquifoliales)

Archer, R.H. in Leistner: 98 (2000).

Sthn trop. Afr.: genus 1, species 1.

Ilex L.

Exell & Mendonça: 348 (1951); Mendes: 353 (1966); Mendes: 1 (1973); White *et al.*: 150 (2001); Coates Palgrave: 587 (2002).

Sthn trop. Afr. 1: *Ilex mitis* (L.) Radlk. var. *mitis*: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- EXELL, A.W. & MENDONÇA, F.A. 1951. Aquifoliaceae. *Conspectus flora angolensis* 3: 348, 400.
- MENDES, E.J. 1966. Aquifoliaceae. *Flora zambesiaca* 2(2): 353–355.
- MENDES, E.J. 1973. Aquifoliaceae. *Flora de Moçambique* 47: 1–3.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Araliaceae

(Rosidae—Apiales)
(Euastrids II—Apiales)

Bredenkamp, C.L. in Leistner: 99 (2000).

Sthn trop. Afr.: genera 5, species 25.

Identification of additional genus using the key in the above reference: *Polyscias* will run to 1b but differs from all other genera beyond that couplet in having pinnately compound leaves.

Centella L.

Norman: 198 (1929) under Apiaceae (Umbelliferae); Cannon: 339(1970); Cannon: 561 (1978); Cannon & Martins: 7 (1981b) under Apiaceae (Umbelliferae); Izidine & Bandeira: 49 (2002) under Apiaceae.

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cussonia Thunb.

Cannon: 362 (1970); Bamps: 102 (1974a); Bamps: 6 (1974b); Cannon: 628 (1978); Cannon & Martins: 9 (1981a); White *et al.*: 152 (2001); Coates Palgrave: 846 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hydrocotyle L.

Cannon: 336 (1970); Cannon: 557 (1978); Cannon & Martins: 4 (1981b) all under Apiaceae (Umbelliferae).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polyscias J.R.Forst. & G.Forst.

Norman: 236 (1933); Cannon: 361 (1970); Bamps: 120 (1974a); Bamps: 2 (1974b); Cannon: 625 (1978); Cannon & Martins: 5 (1981a); Plunkett *et al.*: 213 (2001); White *et al.*: 154 (2001); Coates Palgrave: 845 (2002).

Trees, often tall and with noticeably regular branching. **Leaves** petiolate, pinnately compound, glabrous to densely tomentose with stellate or simple hairs; leaflets simple, ± entire. **Inflorescence** paniculate, regularly compound, racemously branched with ultimate divisions of racemules or umbellules. **Calyx** forming a shallow cup, subentire or shallowly 5-toothed. **Petals** 5. **Stamens** 5. **Ovary** 2-locular; styles 2 (or 5), divergent for nearly their entire length; stylopodium not well-developed. **Fruit** terete or slightly compressed. **Seeds** rounded or laterally compressed, ellipsoid, smooth or sometimes ribbed; endosperm not ruminant.

Sthn trop Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Schefflera J.R.Forst. & G.Forst.

Cannon: 361 (1970); Bamps: 126 (1974a); Bamps: 16 (1974b); Cannon: 622 (1978); Cannon & Martins: 2 (1981a); White *et al.*: 154 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 845 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- BAMPS, P. 1974a. Contribution à l'étude des Araliacées africaines. *Bulletin du Jardin Botanique National de Belgique* 44: 101–139.
- BAMPS, P. 1974b. *Flore d'Afrique centrale*. Spermatophytes. Araliaceae: 1–30.
- BINGHAM, M.G. & SMITH, P.P. 2002. Zambia. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 135–156. SABONET, Pretoria.
- CANNON, J.F.M. 1970. Umbelliferae (in part). *Conspectus florae angolensis* 4: 361–381.
- CANNON, J.F.M. 1978. Umbelliferae (in part). *Flora zambesiaca* 4: 557–565.

CANNON, J.F.M. & MARTINS, E.S. 1981a. Araliaceae. *Flora de Moçambique* 88: 1–15.

CANNON, J.F.M. & MARTINS, E. 1981b. Umbelliferae (in part). *Flora de Moçambique* 87: 4–9.

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.

IZIDINE, S. & BANDEIRA, S.O. 2002. Mozambique. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 43–60. SABONET, Pretoria.

NORMAN, C. 1929. Umbelliferae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67, Supplement, Polypetalae: 198–203.

NORMAN, C. 1933. Araliaceae. Mr. John Gossweiler's Portuguese West African plants. *The Journal of Botany* 71, Supplement 1, Polypetalae: 236.

PLUNKETT, G.M., LOWRY, P.P. II & BURKE, M.K. 2001. The phylogenetic status of *Polyscias* (Araliaceae) based on nuclear ITS sequence data. *Annals of the Missouri Botanical Garden* 88: 213–230.

WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Aristolochiaceae

(Magnoliidae—Aristolochiales)

(Magnoliids—Aristolochiales)

Jordaan, M. in Leistner: 100 (2000).

Sthn trop. Afr.: genera 2, species 5.

Key to genera

[partly after Verdcourt (1986)]

- Fruit dehiscent, short; stigmatic lobes up to 6; anthers up to 6; flowers borne on leafy shoots **Aristolochia**
- Fruit indehiscent, elongate, strongly ribbed; stigmatic lobes 6–12; anthers 6–24; flowers mostly on the old wood **Pararistolochia**

Aristolochia L.

White: 44 (1962); Binns: 19 (1968); Stannard: 19 (1997); González: 159 (1999); White *et al.*: 158 (2001).

Sthn trop. Afr. 4, including the introduced **Aristolochia elegans* Mast., which is widely cultivated and naturalised in many places, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and introduced in sthn Afr.

Pararistolochia Hutch. & Dalziel

Hutchinson & Dalziel: 75 (1927); Poncy: 466 (1977); Poncy: 916 (1984); Verdcourt: 1 (1986); Huber: 135 (1993); Stannard: 19 (1997).

Climbing woody shrubs; stems mostly little-branched, older stems bilobed in transverse section. **Leaves** ± undulate or 3-lobed, mostly deeply cordate at base, glabrous, long-petiolate; pseudostipules absent. **Flowers** mostly borne on old wood in clusters of (1)2 or 3; without foliaceous prophyll; with odour of carrion. **Perianth** obliquely tubular, base inflated-globose, pouched; throat of tube with downwardly projecting ivory-white or violet hairs; lobes 3, equal, triangular-lanceolate, horizontally spreading. **Gynostemium**: lobes and anthers 9. **Ovary** 6-locular; ovules many. **Fruit** woody, cucumber-like, indehiscent, strongly 6-ribbed, straight or curved. **Seeds** ± 100 per locule, triangular, flattened, arranged in line in each locule.

Species ± 18, Old World tropics, 9 in trop. Africa; sthn trop. Afr. 1: *Pararistolochia triactina* (Hook.f.) Hutch. & Dalziel, Angola.

References

- BINNS, B. 1968. *A first check list of the herbaceous flora of Malawi*. Government Printer, Zomba, Malawi.
- GONZÁLEZ, F. 1999. Inflorescence morphology and the systematics of Aristolochiaceae. *Systematics and geography of plants* 68: 159–172.
- HUBER, H. 1993. Aristolochiaceae. In: K. Kubitzki, J.G. Rohwer, & V. Bittrich, *The families and genera of vascular plants* 2. Springer-Verlag, Berlin.
- HUTCHINSON, J. & DALZIEL, J.M. 1927. Aristolochiaceae. *Flora of west tropical Africa* 1: 75–78.
- PONCY, O. 1977. Le genre *Pararistolochia*, Aristolochiaceae d'Afrique tropicale. *Adansonia* sér. 2, 17(4): 465–494.
- PONCY, O. 1984. Aristolochiaceae. *Distributiones plantarum africanarum* 27: 916.
- STANNARD, B.L. 1997. Aristolochiaceae. *Flora zambesiaca* 9, 2: 19–24.
- VERDCOURT, B. 1986. *Flora of tropical east Africa*. Aristolochiaceae: 1–12.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Asteraceae
(**Compositae**)
(**Asteridae—Asterales**)
(**Euasterids II—Asterales**)

Herman, P.P.J., Retief, E., Koekemoer, M. & Welman, W.G. in Leistner: 101 (2000).

Sthn trop. Afr.: genera 147, species 844.

Key to tribes

- 1a Corollas all strap-shaped, equally 5-toothed at apex; latex present **Cichorieae** (p.83)
- 1b Corollas not strap-shaped, OR if some or all strap-shaped, than these with 3(4) or fewer apical teeth:
- 2a Involucral bracts in 1 row, cohering by their overlapping margins, or partly or wholly connate; with or without a calyculus of small, often black-tipped, external bracts; pappus present:
- 3a Involucral bracts with evident elongated oil glands; mature cypselas black **Heliantheae** (p. 85)
- 3b Involucral bracts without elongated oil glands; cypselas not black **Senecioneae** (p. 88)
- 2b Involucral bracts imbricate, in 2 or more rows, free or connate; OR if in one row then pappus absent, or capitula unisexual or cypselas densely villous with long hairs:
- 4a Style branches with conspicuous, ± clavate papillose appendages; capitula discoid, with all flowers bisexual, not yellow; corollas with 5(4) relatively short, broad apical teeth; mature cypselas black **Eupatorieae** (p. 84)
- 4b Style branches, capitula, corolla and cypselas not showing the above combination of characters:
- 5a Capitula homogamous, all florets tubular and bisexual, OR if capitula unisexual, then plants dioecious:
- 6a Leaves spiny:
- 7a Anthers tailed; receptacle densely setose **Cardueae** (p. 83)
- 7b Anthers not tailed; receptacle honeycombed with fringed pits **Arctotideae** (p. 84)
- 6b Leaves not spiny:
- 8a Anthers not tailed; styles shortly hairy on upper part of shaft and on outside of the long acute style branches **Vernonieae** (p. 83)
- 8b Anthers tailed or capitula unisexual; styles not as above:
- 9a Receptacle densely setose; florets all tubular **Cardueae** (p. 83)
- 9b Receptacle not setose but naked or scaly; florets all tubular or the outer ones or all bilabiate **Mutisieae** (below)
- 5b Capitula heterogamous, OR if homogamous, then florets with 5, 4 or 3 relatively short and wide lobes, OR involucral bracts with appendages or margins which are thin and dry and often brownish, OR if capitula unisexual then plants monoecious:
- 10a Style branches of bisexual disc florets connate nearly to the tips, with upper part of style shaft abruptly or gradually thickened below them; involucral bracts, if connate in lower part, in several rows; capitula always bisexual **Arctotideae** (p. 84)
- 10b Style branches of disc florets long to short or absent but upper part of style shaft not thickened as above, or capitula unisexual and monoecious; involucral bracts, if connate, in 1 row:
- 11a Receptacle scaly, OR if not scaly then pappus of scales, and/or leaves opposite, and/or cypselas black, and/or capitula unisexual **Heliantheae** (p. 85)
- 11b Receptacle not scaly OR if so, then leaves not opposite, cypselas not black and capitula not unisexual:
- 12a Style branches with a subulate to triangular appendage **Astereae** (p. 86)
- 12b Style branches without a subulate to triangular appendage, acute to rounded, or truncate and fringed with short hairs or papillae:
- 13a Involucral bracts with thin, dry, usually brown, often erose margins; style branches truncate and fringed; pappus of hairs absent **Anthemideae** (p. 84)
- 13b Involucral bracts green and herbaceous or with almost transparent margins or with thin, dry, membranous appendages; pappus of hairs present, OR if absent, then style branches not truncate and fringed, or involucral bracts in 1 row:
- 14a Pappus present; anthers tailed, sometimes minutely so **Inuleae** (including **Gnaphalieae** and **Plucheeae**) (p. 87)
- 14b Pappus absent; anthers not tailed:
- 15a Fruits large, curved or angular or winged cypselas or smooth drupes **Calenduleae** (p. 84)
- 15b Fruits small columnar cypselas **Senecioneae** (p. 88)

Tribe **Mutisieae**

Key to genera

- 1a Plants dioecious; shrubs or trees:
- 2a Pappus of scabrid bristles **Brachylaena**
- 2b Pappus 0 **Tarchonanthus**
- 1b Plants monoecious; suffrutices with annual stems from woody rootstocks, or annual herbs:
- 3a Scales present on receptacle, resembling the inner involucral bracts **Erythrocephalum**
- 3b Scales on receptacle 0:
- 4a Plants acaulescent but possessing a scape (*Dicoma plantaginifolia* sometimes apparently acaulescent but never possessing a scape) **Gerbera**
- 4b Plants caulescent, not scapigerous; stems occasionally much abbreviated with capitula borne at ground level:
- 5a Capitulum radiate; ray florets neuter with strap-shaped, ± oblanceolate, erect limb; pappus of narrow scales **Passacordoa**

- 5b Capitulum discoid or disciform; outer florets sometimes filiform, neuter and/or bilabiate but not strap-shaped; pappus of barbellate or plumose setae:
 - 6a Apices of involucre bracts rounded or narrowly obtuse; corolla limb well exerted above pappus and involucre; leaves usually stem-sheathing at the base **Pleiotaxis**
 - 6b Apices of involucre bracts tapering-pungent; corolla hardly visible above the pappus; leaves not stem-sheathing at the base, or if so then innermost involucre bracts shorter and broader than outer ones **Dicoma**

Tribe Cardueae

Key to genera

- 1a Leaves and stem-wings, if present, not spinescent at the margins; outer involucre bracts with a distinct apical appendage spinose on the margins; pappus of scale-like setae free to the base; capitula heterogamous, radiate; plants not thistle-like **Centaurea**
- 1b Leaves and stem-wings spinescent at the margins; outer involucre bracts without obvious apical appendages, apices ± spinescent, sometimes pectinate-spinescent or lacerate on the margins about the apex; pappus setae connate at the base into a ring; capitula homogamous; plants thistle-like:
 - 2a Pappus setae feathery; margins of outer involucre bracts pectinate-spinescent **Cirsium**
 - 2b Pappus setae not feathery; margins of involucre bracts entire **Carduus**

Tribe Vernoniaeae

Key to genera

- 1a Capitula aggregated in many secondary capitula surrounded by bracts; involucre bracts ± 8, decussate **Elephantopus**
- 1b Capitula free or in clusters, but without bracts surrounding the clusters; involucre bracts more than 8, imbricate:
 - 2a Pappus in 1 whorl of few free bristles or scales, or ± fused into a tubular to cup-shaped structure, or a short rim, or an undulate to denticulate corona, or pappus absent:
 - 3a Leaves pinnatisect; cypselas 4-angled, pappus 0 **Rastrophyllum**
 - 3b Leaves entire, serrate or dentate:
 - 4a Hairs on stem T-shaped, with short stalk and two long equal arms **Gutenbergia**
 - 4b Hairs on stem simple or asymmetrically T-shaped (one short and one long arm):
 - 5a Receptacle with scales between the florets; pappus tubular to cup-shaped, or a short denticulate corona:
 - 6a Pappus a membranous tubular cupule; cypselas subcylindric **Gossweilera**
 - 6b Pappus a short denticulate corona; cypselas 5-angled **Omphalopappus**
 - 5b Receptacle without scales between the florets; pappus various:
 - 7a Pappus of 4–8 scales **Ageratinastrum**
 - 7b Pappus a short rim or corona, or of bristles, or absent:
 - 8a Pappus absent or a short rim or corona:
 - 9a Pappus absent or represented by a short apical rim; cypselas ± turbinate, (3–)5(6)-ribbed **Ethulia**
 - 9b Pappus a short undulate corona; cypselas obovoid, ± 10-ribbed **Muschleria**
 - 8b Pappus of few bristles:
 - 10a Cypselas with glands in sunken pits; pappus of few coarsely barbellate bristles; corolla lobes hairy **Erlangea**
 - 10b Cypselas with raised glands, or glands only in grooves, or absent; corolla lobes mostly glabrous **Bothriocline**
 - 2b Pappus in 2 or more whorls, the inner whorl composed of setae, the outer whorl of setae or scales or reduced to a low ring of free or ± united brief scales:
 - 11a Inner pappus copious, with many bristles:
 - 12a Corolla orange-yellow **Distephanus**
 - 12b Corolla purple, mauve, blue, green or white **Vernonia**
 - 11b Inner pappus of few bristles or scales:
 - 13a Receptacle with scales between the florets/cypselas **Dewildemanium**
 - 13b Receptacle without scales:
 - 14a Pappus of 4–7 broad, ± united scales alternating with 4–7 paleaceous setae **Ageratinastrum**
 - 14b Pappus of small scales and larger bristles:
 - 15a Inner pappus bristles longer than 3 mm or if shorter, then plant with T-shaped hairs; outer pappus of scales **Vernonia**
 - 15b Inner pappus bristles 1.5–2.5 mm long, or if longer, then outer pappus a rim **Brachytrix**

Tribe Cichorieae (Lactuceae)

Key to genera

- 1a Pappus of a small rim of scales up to 2 mm long; stalks of individual capitula widened just below the capitulum ***Cichorium**
- 1b Pappus of hairs or bristles at least 4 mm long; stalks of individual capitula not widened:
 - 2a Pappus hairs (at least the inner ones) plumose ***Hypochaeris**
 - 2b Pappus hairs at most barbellate:
 - 3a Cypselas distally tuberculate, with long, slender beak; scape with a single capitulum, the stalk hollow ***Taraxacum**
 - 3b Plants not scapose, or cypselas and scapes not as above:
 - 4a Cypselas beaked or attenuate distally, with ascending hairs or projections on the ribs or margins:
 - 5a Cypselas ± compressed, abruptly constricted; involucre bracts without setae (except in *Lactuca glandulifera*); flowers yellow, blue, purple or white **Lactuca**

- 5b Cypselas terete, gradually tapering; involuclral bracts setose; flowers yellow only **Crepis**
- 4b Cypselas truncate, without ascending hairs or projections (but occasionally slightly beaked with muricate ribs in *Launaea*):
- 6a Flowers pink or purple; leaves ± peltate **Prenanthes**
- 6b Flowers yellow; leaves sessile, or with petiole proximally:
- 7a Cypselas compressed; involuclral bracts usually pale tomentose at base **Sonchus**
- 7b Cypselas columnar; involuclral bracts glabrous or hairy, but not tomentose proximally:
- 8a Involuclral bracts glabrous or with a minute tuft of hairs at the apex (*Launaea cornuta* with a single seta near the apex) **Launaea**
- 8b Involuclral bracts hairy or setose:
- 9a Cypselas 2.0–3.5 mm long, obconic, truncate above, pappus of comparatively few coarse scabrid bristles; involuclral bracts 6–10 mm long, glandular, pubescent to tomentose **Tolpis**
- 9b Cypselas and pappus not as above; involuclral bracts 6–17 mm long, setose, sometimes also pubescent or glandular:
- 10a Leaves with attenuate base; mature cypselas 6–10 mm long **Crepis newii**
- 10b Leaves sessile, with large basal auricles; mature cypselas 2.5–4 mm long **Sonchus oleraceus**

Tribe Arctotideae

Key to genera

- 1a Involuclral bracts ± free, apices obtuse (at least in inner bracts), scarious at the tips and on the margins:
- 2a Cypselas with 2 linear grooves or longitudinal chambers on one face; alveolae on receptacle setose **Arctotis**
- 2b Cypselas obscurely longitudinally ribbed, not developing longitudinal chambers on one face; alveolae on receptacle ± fimbriate, not long-setose:
- 3a Cypselas glabrous or pubescent with a basal tuft of short or long upward-pointing hairs; ray florets female; pappus of overlapping scales **Haplocarpha**
- 3b Cypselas densely woolly, without a basal coma of hairs; ray florets neuter; ovary rudimentary; pappus ± fused, coroniform **Arctotheca**
- 1b Involuclral bracts connate at the base or higher, apices acute or acuminate, often spine-tipped:
- 4a Involuclral bracts connate at the base only, always spiny **Berkheya**
- 4b Involuclral bracts connate to higher up forming a cup-shaped involuclrum, mostly bristly, hardly spiny:
- 5a Pappus in 1 whorl or in 2 whorls and dimorphic, the outer whorl of overlapping sessile scales, the inner whorl of much smaller stipitate scales; plants ± bristly-setose or glabrescent, rarely glandular-hairy **Hirpicium**
- 5b Pappus in 2 whorls of subequal slender accrescent scales, scales of outer whorl not overlapping, scales of inner whorl ± similar in length and shape to the outer but with a short stalk; plants ± araneose or glabrous, not hispid **Gazania**

Tribe Eupatorieae

Key to genera

- 1a Anthers truncate at the apex or minutely apiculate; pappus of 3 or 5 gland-tipped processes **Adenostemma**
- 1b Anthers with an apical appendage; pappus of eglandular bristles or scales:
- 2a Pappus of scales, sometimes accompanied by bristles ***Ageratum**
- 2b Pappus of bristles:
- 3a Involuclral bracts 4 or 5; plant a twiner or scrambler **Mikania**
- 3b Involuclral bracts many, if few then plant erect, not twining:
- 4a Involuclral bracts with coloured tips, deciduous; pappus of many capillary bristles ***Chromolaena**
- 4b Involuclral bracts and pappus not as above; cypselas 5- to 8-ribbed, with many small bristles **Stomatanthes**

Tribe Anthemideae

Key to genera

- 1a Ray florets present:
- 2a Pappus 0; ray florets female **Phymaspermum**
- 2b Pappus of 1 whorl of rounded scales; ray florets sterile **Ursinia**
- 1b Ray florets 0:
- 3a Corolla of bisexual flowers 4-lobed:
- 4a Capitula solitary **Cotula**
- 4b Capitula in corymbiform or subglobose groups **Schistostephium**
- 3b Corolla of bisexual flowers 5-lobed:
- 5a Pappus of small scales; anthers distinctly tailed; plant not markedly aromatic **Inulanthera**
- 5b Pappus 0; anthers not tailed; plants very aromatic **Artemisia**

Tribe Calenduleae

Key to genera

- 1a Shrubs; involuclral bracts in 2 or 3 rows; fruit a fleshy drupe **Chrysanthemoides**
- 1b Herbs or subshrubs; involuclral bracts in 1(2) rows; fruit a cypselas:
- 2a Disc florets functionally male **Osteospermum**
- 2b Disc florets mostly bisexual; disc cypselas laterally flattened with thickened margins **Dimorphotheca**

Tribe **Heliantheae** (including Helenieae)

Key to genera

- 1a Plants monoecious; capitula unisexual:
 - 2a Involucral bracts of male capitula connate; female capitula 1-flowered; cypsela clasped by female involucre which bears 4–6 spines ***Ambrosia**
 - 2b Involucral bracts of male capitula free; female capitula 2-flowered; cypselas clasped by female involucre bearing many hooked spines ***Xanthium**
- 1b Plants dioecious; capitula bisexual:
 - 3a Receptacle without paleae:
 - 4a Perennial herbs with somewhat fleshy roots; ray florets 0, or present and eligulate; involucral bracts many in 3–5 series; involucre more than 5 mm in diameter:
 - 5a Leaves alternate; pappus of toothed scales; corolla yellow **Welwitschiella**
 - 5b Leaves opposite; pappus of \pm fimbriately winged setae, usually terminating in a hooked point; corolla orange **Hypericophyllum**
 - 4b Annual herbs, introduced weeds; ray florets 1–many, ligulate; involucral bracts few in 1–3 series; involucre usually less than 5 mm in diameter (up to 25 mm in *Tagetes patula*):
 - 6a Leaves simple, all opposite; pappus 0; capitula sessile or very shortly pedicelled ***Flaveria**
 - 6b Leaves mostly pinnatisect, opposite or alternate; pappus present; capitula distinctly stalked:
 - 7a Plants strongly aromatic when bruised; leaf lobes narrowly elliptic or lanceolate, margins serrate; involucral bracts united along their margins ***Tagetes**
 - 7b Plants not strongly aromatic; leaf lobes filiform, margins entire; involucral bracts free ***Schkuhria**
 - 3b Receptacle with paleae:
 - 8a Inner florets of disc functionally male:
 - 9a Leaves opposite; cypselas tightly clasped by one of the inner involucral bracts with hooked spines; pappus 0 ***Acanthospermum**
 - 9b Leaves alternate; cypselas clasped by an unarmed involucral bract and 2 paleae, or not clasped but paleae on receptacle strongly conduplicate; pappus of 2–4 stout awns:
 - 10a Cypselas clasped by an involucral scale and 2 lateral, concave, involucral paleae; pappus of 2 recurved awns clasping the margin of the cypsela ***Parthenium**
 - 10b Cypselas often clasped or enfolded by the strongly conduplicate paleae on the receptacle; pappus of (2–)4 stout setae .. **Blepharispermum**
 - 8b Inner florets of disc bisexual, fertile (if numerous florets present then innermost ones sometimes sterile):
 - 11a Paleae on receptacle \pm flat, not clasping the cypselas:
 - 12a Involucral bracts quite free, the inner merging gradually into the receptacular paleae; leaves simple:
 - 13a Pappus 0; lamina of ray florets golden yellow ***Guizotia**
 - 13b Pappus present; lamina of ray florets white, cream or yellow:
 - 14a Pappus of 2 awns or of many bristles; ray florets female, strap-shaped or \pm bilabiate, yellow or creamy:
 - 15a Pappus of many densely plumose bristles; cypselas not winged ***Tridax**
 - 15b Pappus of 2 awns connate to the deeply lobate wings of the cypsela ***Synedrella**
 - 14b Pappus of several scales; rays very small, white ***Galinsoga**
 - 12b Involucral bracts of the inner row connate at the base, outer row with fewer and mostly smaller or narrower bracts; leaves variously divided:
 - 16a Leaves alternate ***Chrysanthellum**
 - 16b Leaves opposite:
 - 17a Ray florets yellow, golden, orange or 0 **Bidens**
 - 17b Ray florets white, pink, lilac or red ***Cosmos**
 - 11b Paleae on receptacle \pm conduplicate and clasping or \pm enfolding cypselas:
 - 18a Involucral bracts 4, in 2 rows of opposite pairs, leafy; flower heads axillary, sessile or subsessile **Enydra**
 - 18b Involucral bracts 3 to many, but not in 2 rows of opposite pairs and leafy; capitula not sessile or subsessile and axillary:
 - 19a Inner involucral bracts embracing fertile ray cypselas; involucral bracts spatulate and densely glandular ***Sigesbeckia**
 - 19b Inner involucral bracts not embracing outermost cypselas:
 - 20a Leaves usually alternate; paleae of receptacle boat-shaped to slightly conduplicate:
 - 21a Paleae clasping the cypselas produced above into a \pm tubular neck; ray florets 0 or sterile **Sclerocarpus**
 - 21b Paleae of receptacle slightly conduplicate, if partly enfolding cypselas, then not produced into a tubular neck **Athroisma**
 - 20b Leaves opposite, sometimes alternate above:
 - 22a Cypselas surmounted by a distinct, often lacerate cupule; additional pappus bristles present or not:
 - 23a Ray florets sterile (although style and stigmas rarely present); all cypselas \pm alike, bilaterally convex or obscurely 4-angled **Aspilia**
 - 23b Ray florets fertile (with style and stigmas, and producing mature cypselas); outer cypselas \pm triquetrous; lamina small, white **Blainvillea**
 - 22b Cypselas without pappus, or with pappus of various kinds, but not a cupule:
 - 24a Ray florets persistent; unbranched annual herbs up to 0.6 m high; leaves narrowly oblong-ovate ***Zinnia**
 - 24b Ray florets not persistent:
 - 25a Cypselas 4-sided; capitula large and showy with orange-red or yellow ray florets; apex of peduncles becoming very thick ***Tithonia**
 - 25b Cypselas \pm compressed or, if not noticeably compressed, peduncles not swollen above:

- 26a Paleae of receptacle obovate, truncate-emarginate and caudate-spinescent at apex; perennial shrubs up to 6 m tall with white rays ***Montanoa**
- 26b Paleae of receptacle not caudate-spinescent:
- 27a Disc florets deep purple, at least above **Helianthus**
- 27b Disc florets not purple:
- 28a Disc florets white; paleae of receptacle very narrow and often setiform ***Eclipta**
- 28b Disc florets not white, ± yellowish to orange:
- 29a Cypselas thick or angular, not compressed, pubescent at apex, not winged or margined **Melanthera**
- 29b Cypselas ± compressed, winged or with a hyaline cartilaginous margin:
- 30a Receptacle flat; cypselas with broad, irregular margin; lamina of ray florets 10 mm long or more ***Verbesina**
- 30b Receptacle convex to narrowly conical; cypselas with hyaline, cartilaginous margin; capitula radiate or discoid:
- 31a Capitula discoid; pappus of 2 or 3 rigid bristles **Spilanthes**
- 31b Capitula radiate; pappus 0 **Acmella**

Tribe Astereae

Key to genera

- 1a Pappus in 1 series or rudimentary to 0:
- 2a Capitula distinctly radiate:
- 3a Pappus of minute scales or a minute annular rim:
- 4a Receptacle dome-like; leaves alternate, pinnatifid **Gyrodoma**
- 4b Receptacle flat; leaves alternate or opposite, linear **Jeffreya**
- 3b Pappus of scabrid or barbellate bristles:
- 5a Scandent or twining shrubs **Microglossa**
- 5b Herbs or shrubs, not scandent or twining **Felicia**
- 2b Capitula discoid or disciform:
- 6a Capitula discoid:
- 7a Capitula laxly corymbose; pappus bristles stiff and tough, somewhat flattened and wider towards the base **Dacryotrichia**
- 7b Capitula mostly solitary, terminal, pedunculate; pappus bristles finely setaceous **Felicia**
- 6b Capitula disciform or shortly radiate:
- 8a Outer female florets in one row **Nolletia**
- 8b Outer female florets in 2 to many rows:
- 9a Receptacle ± swollen; style branches with lanceolate appendages; pappus 0 or of 1 or 2 bristles **Dichrocephala**
- 9b Characters not as above:
- 10a Pappus of few basally connate bristles, a corona present or not **Grangea**
- 10b Pappus of many barbellate bristles:
- 11a Disc florets functionally male; cypselas turbinate; shrubs **Psiadia**
- 11b Disc florets bisexual, rarely some functionally male; cypselas obovoid-oblong or ellipsoid, compressed; annual or perennial herbs, rarely shrubs:
- 12a Marginal florets (short rays) yellow **Nidorella**
- 12b Marginal florets (short rays) white, pink or mauve:
- 13a Style branch appendages larger than stigmatic area, lanceolate-linear, acute or acuminate; cypselas obovoid-oblong, somewhat compressed, pubescent and glandular **Aster**
- 13b Style branch appendages lanceolate to triangular; cypselas obovoid-oblong, sometimes compressed, pubescent .. **Conyza**
- 1b Pappus in 2 series:
- 14a Capitula radiate:
- 15a Pappus of bristles only:
- 16a Style branch appendages longer than stigmatic area, lanceolate-linear, acute or acuminate **Aster**
- 16b Style branch appendages shorter than stigmatic area, lanceolate to triangular, acute or obtuse ***Erigeron**
- 15b Pappus of an outer row of scales and an inner row of bristles:
- 17a Leaves opposite **Engleria**
- 17b Leaves alternate, rarely lower ones opposite:
- 18a Leaves small, ericoid; cypselas with 2 resin sacs in ribs **Chrysocoma**
- 18b Leaves usually broad or long, not ericoid; cypselas without ribs and resin sacs **Aster**
- 14b Capitula disciform or discoid:
- 19a Capitula disciform; pappus of bristles only **Conyza**
- 19b Capitula discoid:
- 20a Pappus of bristles only **Pteronia**
- 20b Pappus of bristles and scales:
- 21a Leaves opposite **Engleria**
- 21b Leaves alternate, ericoid **Chrysocoma**

Tribe **Inuleae** (including Gnaphalieae and Plucheeae)

Key to genera

- 1a Stems without resin ducts; leaves generally entire, with hairs with 1 basal cell and a very long terminal cell; involucre bracts with entire or divided sclerenchymatous basal portion; pollen with 2-layered sexine (Gnaphalieae):
 - 2a Leaves denticulate, dentate, serrulate, serrate or lobed; involucre bracts cartilaginous or herbaceous, without papery lamina:
 - 3a Capitula radiate:
 - 4a Receptacle epaleate **Athrixia**
 - 4b Receptacle paleate:
 - 5a Pappus of barbellate bristles and a crown of scales; corolla of disc florets yellow **Philyrophyllum**
 - 5b Pappus of rigid awns; corolla of disc florets purplish **Callilepis**
 - 3b Capitula discoid or disciform:
 - 6a Stem and leaves villose; florets yellow; pappus of short rigid bristles and short scales **Artemisiopsis**
 - 6b Stem and leaves glabrous or puberulous; florets white or blue; pappus of 1 plumose capillary bristle only **Denekia**
 - 2b Leaves entire or else involucre bracts have a papery lamina:
 - 7a Involucre bracts cartilaginous or herbaceous; capitula radiate; disc florets purplish black **Callilepis**
 - 7b Involucre bracts with papery lamina, or if otherwise then capitula disciform or discoid:
 - 8a Involucre bracts entirely cartilaginous or herbaceous; capitula 1-flowered **Stoebe**
 - 8b Involucre bracts conspicuously papery:
 - 9a Florets purple, at least apically or basally:
 - 10a Cypselas with globose hairs; pappus basally connate ***Gamochaeta**
 - 10b Cypselas with clavate or elongated hairs; pappus free **Gnaphalium**
 - 9b Florets yellow:
 - 11a Pappus bristles apically plumose, basally connate; stereome undivided; cypselas with globose, myxogenic twin-hairs **Helichrysopsis**
 - 11b Pappus bristles barbellate, basally free; stereome divided; cypselas never with globose twin-hairs:
 - 12a Capitula with less than 20 florets **Helichrysium**
 - 12b Capitula with more than 20 florets **Pseudognaphalium**
 - 1b Stems with or without resin ducts; leaves dentate, denticulate, serrulate or pinnatifid, rarely entire, with multiseptate hairs with short cells; involucre bracts with undivided sclerenchymatous portion; pollen with 1-layered sexine:
 - 13a Female florets in 1 row, radiate, miniradiate, rarely filiform or absent; style with acute sweeping hairs ending above furcation, rarely with obtuse sweeping hairs (*Anisopappus*) (Inuleae in strict sense):
 - 14a Pappus 0, or of wide scales often with protruding mid-portion or very short, not of capillary bristles:
 - 15a Receptacle paleate **Anisopappus**
 - 15b Receptacle epaleate:
 - 16a Receptacle clothed with many bristles **Geigeria**
 - 16b Receptacle without bristles **Calostephane**
 - 14b Pappus of well-developed capillary bristles:
 - 17a Pappus of bristles and scales:
 - 18a Pappus bristles plumose **Pegolettia**
 - 18b Pappus bristles barbellate:
 - 19a Pappus scales forming a short connate cup; capitula generally disciform **Pulicaria**
 - 19b Pappus scales ± free; capitula discoid **Pegolettia**
 - 17b Pappus of bristles only:
 - 20a Capitula discoid:
 - 21a Capitula small, few-flowered ***Pentanema**
 - 21b Capitula larger, many-flowered **Inula glomerata**
 - 20b Capitula radiate or disciform:
 - 22a Marginal florets radiate or miniradiate **Inula paniculata**
 - 22b Marginal florets filiform:
 - 23a Leaves linear-lanceolate, sessile, margin entire; involucre bracts linear-lanceolate, distinctly imbricate; stems sometimes narrowly winged **Pechuel-Loeschea**
 - 23b Leaves elliptic to ovate, petiolate, margins serrate; involucre bracts many, linear-filiform; stems never winged **Blumea**
 - 13b Female florets in several rows, filiform or rarely radiate; style with obtuse sweeping hairs (Plucheeae):
 - 24a Capitula aggregated in dense compound heads:
 - 25a Pappus absent; receptacle naked **Sphaeranthus**
 - 25b Pappus of free barbellate bristles in 1 row; receptacle paleate **Neojeffreya**
 - 24b Capitula free from each other, if densely grouped then individual heads distinct:
 - 26a Pappus 0 or consisting of scales or of both small scales and bristles:
 - 27a Stems winged; pappus absent, at least in outer florets **Litogyne**
 - 27b Stems not winged; pappus of both bristles and small scales **Porphyrostemma**
 - 26b Pappus of bristles (in one or more rows):
 - 28a Pappus bristles few (1–6):

- 29a Leaves and/or stems glandular, not scabridulous; involucre bracts glandular, ± glabrous **Nicolasia**
 29b Leaves not glandular, scabridulous above; involucre bracts hispid **Porphyrostemma**
 28b Pappus bristles many (more than 8):
 30a Florets yellow or whitish:
 31a Florets whitish; leaves long-decurrent; cypselas pilose ***Pterocaulon**
 31b Florets yellow; leaves not long-decurrent; cypselas glabrous or sparsely pilose **Pluchea**
 30b Florets pink or purple:
 32a Style of outer florets entire or emarginate **Adelostigma**
 32b Style clearly 2-lobed:
 33a Stems with interrupted stem wings **Pseudoconyza**
 33b Stems with continuous wings:
 34a Cypselas pubescent; involucre bracts not deciduous; stem wings entire or (in *L. crispata* with elongated terminal panicles) dentate **Laggera**
 34b Cypselas glabrous or sparsely pilose; inner involucre bracts deciduous after anthesis; stem wings coarsely dentate; inflorescence corymbose **Pluchea ovalis**

Tribe Senecioneae

Key to genera

- 1a Capitula calyculate (with a calyculus: at least 1 but usually more additional small outer involucre bracts):
 2a Petioles prehensile, thickened basally; anther bases with sterile tailed appendages:
 3a Leaves auriculate at the base; capitula radiate **Austrosynotis**
 3b Leaves exauriculate; capitula disciform **Mikaniopsis**
 2b Petioles not prehensile; anther bases without tailed appendages:
 4a Crystals in ovary wall simple, plate-like, needle-like or simple:
 5a Outer (ray) cypselas dorsiventrally compressed **Cineraria**
 5b Outer (ray) cypselas not compressed, or radiate florets 0:
 6a Style branch apices without appendages, truncate or rounded **Senecio**
 6b Style branch apices with a very short to elongated appendage of fused papillae **Crassocephalum**
 4b Crystals in ovary wall compound, drusiform:
 7a Plants truly succulent with fleshy leaves and/or stems; style branches with conical to somewhat elongated appendage **Kleinia**
 7b Plants at most subsucculent:
 8a Style branches truncate, sometimes with a central tuft of fused papillae **Solanecio**
 8b Style branches with a long, tapering, papillose appendage **Gynura**
 1b Capitula ecalyculate: without any small outer involucre bracts:
 9a Capitula radiate:
 10a Annual herbs; pappus 0 **Stenops**
 10b Perennial herbs, shrublets or herbs; pappus of fine bristles:
 11a Disc florets bisexual **Euryops**
 11b Disc florets functionally male **Othonna**
 9b Capitula discoid:
 12a Plants truly succulent with fleshy leaves and/or stems **Kleinia**
 12b Plants at most subsucculent:
 13a Plants shrubby, sometimes subsucculent **Lopholaena**
 13b Plants annual or perennial herbs:
 14a Leaves rosulate, linear; cypselas obovoid, glandular; pappus of a few scabrid, soon caducous bristles **Pseudotrichia**
 14b Leaves cauline, mostly broader than linear; cypselas glabrous or pubescent, not glandular; pappus of a single ± linear scale or of many bristles:
 15a Corolla longer than ovary; pappus of many fine bristles **Emilia**
 15b Corolla half as long as ovary; pappus of a single ± linear scale **Emiliella**

***Acanthospermum** Schrank

(Heliantheae)

Mendonça: 89 (1943); Wild: 5 (1967).

Stn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and stn Afr.

Acmella Rich. ex Pers.

(Heliantheae)

Persoon: 472 (1807); Jansen: 1 (1985); Lisowski: 228 (1991); Karis & Ryding: 586 (1994).

Annual herbs. **Leaves** opposite and/or basally rosulate. **Capitula** usually radiate, sometimes disciform or discoid, solitary or cymose. **Involucre bracts** in 1–3 rows, subequal or with outer row spreading and longer, entire or irregularly dentate. **Receptacle** narrowly conical, acuminate to obtuse at the apex, paleae laxly enclosing florets. **Ray florets** female, fertile, 3–22 per capitulum, usually small, 2- to 3-lobed, variously coloured. **Disc florets** bisexual, fertile, 4- to 5-lobed, small, variously coloured. **Cypselas** ciliate, glabrous or sometimes with glabrous margins; ray cypselas broadly ovate or elliptic, 3-angled; disc cypselas elliptic, strongly compressed. **Pappus** 0.

Species 30, tropical, some pantropical weeds; sthn trop. Afr. 1: *Acmella caulirhiza* Delile, Angola, Zambia, Zimbabwe, Malawi, Mozambique. According to Lisowski (1991) also in sthn Afr.

Adelostigma Steetz
(Pluceaeae)

Steetz: 428 (1864); Wild: 17 (1975); Anderberg: 297 (1994).

Erect annual herbs with resin canals. **Leaves** alternate, linear, entire or denticulate. **Capitula** disciform, solitary, terminal. **Florets**: outer florets female, filiform; central florets functionally male, tubular with 5 dark purple longitudinal lines commencing between lobes. **Anthers** very shortly tailed. **Style** almost undivided. **Cypselas** ellipsoid, sparsely hairy with straight hairs. **Pappus** of free, barbellate bristles in 1 series, each bristle with adpressed teeth.

Species 2, trop. Africa; sthn trop. Afr. 1: *Adelostigma athrioides* Steetz, Mozambique.

Adenostemma J.R.Forst. & G.Forst.
(Eupatorieae)

Mendonça: 40 (1943); Lisowski: 467 (1991).

Species 24, tropical America and Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Ageratinastrum Mattf.
(Vernonieae)

Mattfeld: 412 (1932); Wild & Pope: 357 (1977b); Pope: 180 (1992); Bremer: 216 (1994); Jeffrey & Beentje: 276 (2000); Bingham & Smith: 140 (2002).

Perennial herbs with annual stems from a woody rootstock; vegetative indumentum of short-stalked flagelliform hairs. **Stems** many, densely leafy, with short internodes, branching above. **Leaves** alternate or spirally arranged, opposite or whorled, sessile to shortly petiolate, felted-tomentose, sparsely pilose or glabrescent, glandular-punctate. **Capitula** homogamous, many, in lax or ± dense clusters at ends of branches, or capitulum-clusters arranged in a large corymbiform cyme. **Involucre** campanulate to subglobose, florets exserted; phyllaries several-seriate, progressively larger to inside. **Receptacle** flat, shallowly alveolate. **Corollas** purple or mauve, darker in upper half, regularly 5-lobed, lobes lanate or pilose-hispid. **Anthers** with a broad hyaline apical appendage and short acute tails at base. **Style**: arms subulate, hairy outside. **Cypselas** obovoid-oblong or turbinate, 4- or 5-sided and obscurely ribbed on the angles, truncate at apex, smooth or strongly rugose on faces between ribs, glabrous or sparsely setulose, minutely brown gland-dotted. **Pappus** persistent, of ± united broad shiny scales lacerate on upper margin, or of scales sometimes free and alternating with paleaceous setae. **Pollen** described as triporate, lophate and emicropunctate.

Species 2, east central trop. Africa; sthn trop. Afr. 2, Zambia, Malawi.

***Ageratum L.**
(Eupatorieae)

Mendonça: 41 (1943); Binns: 29 (1968); Lisowski: 472 (1991); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 2, Angola, Zambia, and sthn Afr.

***Ambrosia L.**
(Heliantheae)

Wild: 2 (1967); Binns: 29 (1968).

Sthn trop. Afr. 1: *Ambrosia maritima* L., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anisopappus Hook. & Arn.
(Inuleae)

Mendonça: 87 (1943); Wild: 45 (1964a); Wild: 80 (1980); Lisowski: 192 (1989); Anderberg: 88 (1991b); White *et al.*: 200 (2001); Beentje: 343 (2002).

Epallage DC.; Binns: 32 (1968). *Sphacophyllum* Benth.; Mendonça: 86 (1943).

Species 30, tropical and sthn Afr.; sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Arctotheca J.C.Wendl.
(Arctotideae)

Pope: 235 (1992).

Species 4, sthn Afr. with 1: *Arctotheca populifolia* (P.J.Bergius) Norl., extending to the foreshore dunes of Mozambique.

Arctotis L.
(Arctotideae)

Norlindh: 403 (1965); Pope: 230 (1992); Bremer: 258 (1994).

Sthn trop. Afr. 1: *Arctotis venusta* Norl., Angola, and sthn Afr.

Artemisia L.
(Anthemideae)

Mendonça: 109 (1943); Lisowski: 245 (1991); White *et al.*: 200 (2001); Beentje: 528 (2002).

Species ± 300, mainly N temperate; sthn trop. Afr. 1: *Artemisia afra* Jacq. ex Willd., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Artemisiopsis S.Moore
(Gnaphalieae)

Wild: 68 (1980); Beentje: 393 (2002).

Monotypic: *Artemisiopsis villosa* (O.Hoffm.) Schweick.; tropical, and sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Aspilia Thouars
(Heliantheae)

Mendonça: 92 (1943); Wild: 197 (1966); Wild: 39 (1967); Hilliard: 306 (1977); Lisowski: 184 (1991).

Wedelia Jacq. in part; Mendonça: 91 (1943).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aster L.
(Astereae)

Binns: 29 (1968); Lippert: 153 (1973); Lippert: 10 (1980); Lisowski: 39 (1991); Beentje: 468 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Athrixia* Ker Gawl.**

(Gnaphalieae)

Kroner: 1 (1980); Lisowski: 228 (1989); Beentje: 454 (2002).

Sthn trop. Afr. 5, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Athroisma* DC.**

(Helenieae)

Candolle: 516 (1833); Wild: 93 (1980); Karis & Ryding: 536 (1994); Eriksson: 101 (1995).

Perennial herbs or subshrubs. **Leaves** alternate, simple or dissected. **Capitula** disciform or discoid, in dense glomerules. **Involucral bracts** 3: 1 subtending, 2 opposite. **Receptacle** narrowly conical, with slightly conduplicate, entire or slightly lobed paleae. **Florets**: marginal florets 2, bisexual, fertile, filiform; disc florets \pm 25, bisexual, fertile, greenish white to purple. **Anthers** caudate. **Cypselas** elliptic to obovate, triquetrous, slightly hairy. **Pappus** a crown or absent.

Species 12, Old World tropics: eastern Africa, Madagascar, NE India, to the Sunda Islands; sthn trop. Afr. 2, Zambia, Zimbabwe.

***Austrosynotis* C. Jeffrey**

(Senecioneae)

Jeffrey: 878 (1986); Bremer: 498 (1994).

Scandent perennial herbs climbing by means of basally thickened petioles. **Leaves** alternate, ovate-cordate, auriculate, palmately veined. **Capitula** radiate, paniculate-corymbose. **Involucre** calyculate. **Florets** yellow. **Anthers** caudate. **Cypselas** oblong, ribbed, glabrous. **Pappus** of many fine bristles.

Monotypic: *Austrosynotis rectirama* (Baker) C. Jeffrey, Tanzania, and Malawi.***Berkheya* Ehrh.**

(Arctotideae)

Mendonça: 131 (1943); Roessler: 104 (1959); Roessler: 74 (1975); Pope: 237 (1992); Halliday & Wilmot-Dear: 290 (2000).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Bidens* L.**

(Heliantheae)

Moore: 58 (1927); Mendonça: 99 (1943); Wild: 13 (1967); Mesfin Tadesse: 437 (1994); White *et al.*: 200 (2001).Sthn trop. Afr. \pm 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.***Blainvillea* Cass.**

(Heliantheae)

Adams: 229 (1956); Adams: 237 (1963); Wild: 38 (1967); Binns: 30 (1968); Karis & Ryding: 589 (1994).

Wedelia Jacq. in part; Mendonça: 91 (1943).Species 10, pantropical; sthn trop. Afr. 1: *Blainvillea gayana* Cass., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.***Blepharispermum* Wight ex DC.**

(Helenieae)

Candolle: 11 (1834); Mendonça: 61 (1943); Wild: 95 (1980); Eriksson: 149 (1992); Karis & Ryding: 536 (1994).

Shrubs, undershrubs or half-climbing shrubs. **Leaves** alternate, petiolate, simple, ovate or lanceolate, entire or sparsely serrate, glabrous or pubescent. **Capitula** disciform, small, aggregated into globose glomerules in terminal corymbs. **Involucral bracts** 3: 1 subtending and 2 opposite. **Receptacle** wart-like with strongly conduplicate, apically 3-lobed paleae. **Marginal florets** 2, female, filiform. **Disc florets** 2 or 4, functionally male. **Anthers** caudate. **Cypselas** elliptic or obcordate, \pm triquetrous. **Pappus** of 2–4 stout setae.

Species 15, Old World tropics; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

***Blumea* DC.**

(Inuleae)

Mendonça: 55 (1943); Randeria: 176 (1960); Adams: 260 (1963); Wild: 125 (1969a); Lisowski: 5 (1989); Anderberg: 105 (1991b); Bremer: 284 (1994); Beentje: 319 (2002).

Sthn trop. Afr. \pm 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.***Bothriocline* Oliv. ex Benth.**

(Vernonieae)

Pope: 162 (1992); Jeffrey & Beentje: 136 (2000); White *et al.*: 202 (2001).Sthn trop. Afr. \pm 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.***Brachylaena* R.Br.**

(Tarchonantheae)

Mendonça: 54 (1943); Pope: 5 (1992); Beentje: 1 (2000a); Jeffrey & Beentje: 4 (2000); Coates Palgrave: 1139 (2002).

Sthn trop. Afr. 3, Angola, Zimbabwe, Mozambique, and sthn Afr.

***Brachythrix* Wild & G.V.Pope**

(Vernonieae)

Wild & Pope: 25 (1978a); Wild & Pope: 135 (1978b); Jeffrey: 270 (1988); Pope: 176 (1992); Bremer: 218 (1994); Jeffrey & Beentje: 277 (2000).

Perennial herbs with annual stems from a small woody rootstock; rootcrowns with or without lanate tufts; roots many, thong-like and usually swelling to form root-tubers; vegetative indumentum a varying mixture of large, long-stalked, flagelliform hairs intermixed with short-stalked T-shaped hairs. **Stems** erect, usually branching above, leafy, sometimes scapiform. **Leaves** alternate, sessile or subsessile, bases cuneate to auriculate; upper surface \pm scabrous, sparsely pubescent or glabrescent; lower surface pubescent or felted, sometimes finely pilose especially on the nerves, or glabrescent, glandular-punctate. **Capitula** homogamous, solitary or few to many in lax corymbiform cymes, or aggregated in \pm dense 3–many-capitulate terminal or laterally borne \pm scorpioidly cymose clusters. **Involucre** campanulate to broadly cup-shaped, occasionally subglobose or narrowly ovoid. **Phyllaries** imbric

cate, several-seriate. **Receptacle** ± flat. **Corollas** purple, narrowly funnel-shaped, regularly deeply 5-lobed; lobes apically setulose or glabrous. **Anthers** with a narrowly triangular hyaline appendage at apex and short subobtus tails at base. **Style**: arms subulate, hairy outside. **Cypselas** narrowly oblong-obovoid, 4- or 5-angular with narrow ribs on the angles, truncate to slightly rounded at apex, faces between ribs with large scattered brownish glandular cells, very sparsely hispid or glabrous. **Pappus** 2-seriate, outer one of short lacerate free or ± united scales or reduced to a low rim, inner one of short very barbellate setae. **Pollen** described as tricolporate, subechinolophate to echinate and micropunctate.

Species 5, south-central and east trop. Africa; sthn trop. Afr. 5, Zambia, Malawi, Mozambique.

Callilepis DC.

(Gnaphalieae)

Wild: 91 (1980); Anderberg: 46 (1991a).

Sthn trop. Afr. 1: *Callilepis laureola* DC., Mozambique, and sthn Afr.

Calostephane Benth.

(Inuleae)

Mendonça: 81 (1943); Wild: 48 (1980); Anderberg: 89 (1991b).

Mollera O.Hoffm.; Mendonça: 80 (1943); Wild: 50 (1980); Lisowski: 53 (1989).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carduus L.

(Cardueae)

Binns: 30 (1968); Pope: 49 (1992); Jeffrey & Beentje: 45 (2000).

Species ± 90, Eurasian and E African mountains, several species widespread weeds; sthn trop. Afr. 1: *Carduus nyassanus* (S.Moore) R.E.Fr., Zambia, Malawi, and sthn Afr.

Centaurea L.

(Cardueae)

Pope: 53 (1992); Jeffrey & Beentje: 60 (2000).

Species ± 500, mainly Mediterranean and SW Asia, few in N and S America, and trop. Africa; sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Chromolaena** DC.

(Eupatorieae)

Lisowski: 449 (1991); Gautier: 645 (1992); Bremer: 655 (1994).

Eupatorium section *Cylindrocephala* DC.

Sthn trop. Afr. 1: **Chromolaena odorata* (L.) R.M.King & H.Robinson, Zimbabwe, and sthn Afr. The first confirmed record for the region appears to be a collection from northern Zimbabwe from as early as 1967 (*Baretta s. n.* in U). Gautier (1992) lists Angola, Zambia, Malawi and Mozambique among the countries likely to be invaded soon.

***Chrysanthellum** Rich.

(Heliantheae)

Mendonça: 106 (1943); Wild: 34 (1967); Turner: 410 (1988).

Sthn trop. Afr. 1: **Chrysanthellum indicum* DC. subsp. *afroamericanum* B.L.Turner var. *afroamericanum*, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chrysanthemoides Fabr.

(Calenduleae)

Binns: 30 (1968); Norlindh: 157 (1978); White *et al.*: 202 (2001); Beentje: 535 (2002); Coates Palgrave: 1148 (2002).

Sthn trop. Afr. 1: *Chrysanthemoides monilifera* (L.) Norl., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chrysocoma L.

(Astereae)

Wild: 14 (1975); Bayer: 259 (1981); Bremer: 417 (1994).

Sthn trop. Afr. ?2, Mozambique, and sthn Afr.

***Cichorium** L.

(Lactuceae)

Lawalrée *et al.*: 4 (1986); Lisowski: 7 (1991); Jeffrey & Beentje: 64 (2000); Mapaura (Unpublished).

Sthn trop. Afr. 1: **Cichorium intybus* L., cultivated but may become naturalised as in sthn Afr.

Cineraria L.

(Senecioneae)

Binns: 30 (1968); Hilliard: 372 (1977); Jeffrey: 930 (1986); Lisowski: 434 (1991); White *et al.*: 202 (2001).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cirsium Mill. emend. Scop.

(Cardueae)

Binns: 30 (1968); Lisowski: 593 (1991); Pope: 51 (1992); Jeffrey & Beentje: 54 (2000).

Sthn trop. Afr. 1: *Cirsium buchwaldii* O.Hoffm., Zambia, Malawi; 2 species naturalised in sthn Afr.

Conyza Less.

(Astereae)

Mendonça: 50 (1943); Binns: 31 (1968); Wild: 247 (1969b); Wild: 171 (1972a); Beentje: 490 (2002).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Cosmos** Cav.

(Heliantheae)

Karis & Ryding: 615 (1994).

Bidens L. in part; Wild: 13 (1967); Hilliard: 316 (1977).

Sthn trop Afr. 2, weeds in Zambia, Zimbabwe, and sthn Afr., originally from North America.

Cotula L.

(Anthemideae)

Mendonça: 109 (1943); Hilliard: 350 (1977); Beentje: 522 (2002); Bingham

(Unpublished); Mapaura (Unpublished); Phiri (Unpublished).

Matricaria L. in part; Hilliard: 346 (1977).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Crassocephalum Moench

(Senecioneae)

Mendonça: 113 (1943); Jeffrey: 904 (1986).

Sthn trop. Afr. ± 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crepis L.

(Lactuceae)

Mendonça: 148 (1943); Lawalrée *et al.*: 19 (1986); Pope: 209 (1992); Jeffrey & Beentje: 66 (2000).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dacryotrichia Wild

(Astereae)

Wild: 67 (1973); Wild: 21 (1975); Bremer: 399 (1994).

Annual herbs. **Leaves** alternate, pinnatifid. **Capitula** laxly corymbose, discoid, hemispheric. **Involucral bracts** 2–3-seriate, imbricate. **Receptacle** ± flat, ± pitted. **Disc florets** bisexual, fertile, yellow. **Cypselas** obovoid, somewhat compressed, pilose. **Pappus** of ± 10 rather stout, flattened, scabrid, persistent bristles in 1 series.

Monotypic: *Dacryotrichia robinsonii* Wild, only known from Zambia.

Denekia Thunb.

(Gnaphalieae)

Mendonça: 59 (1943); Wild: 134 (1969a); Lisowski: 27 (1989); Beentje: 365 (2002).

Monotypic: *Denekia capensis* Thunb.; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Dewildemanina O.Hoffm.

(Vernonieae)

Hoffmann: x (1903); Wild & Pope: 343 (1977b); Jeffrey: 271 (1988); Pope: 183 (1992); Bremer: 219 (1994); Jeffrey & Beentje: 271 (2000).

Perennial herbs with erect, usually tufted, annual stems from a small woody rootstock; roots radiating, thong-like. **Stems** ± strict, branching near apex, glabrous, sparsely pilose or pubescent, densely leafy with leaves often grading into phyllaries. **Leaves** spirally arranged, subsessile, filiform to ± elliptic or lanceolate, glabrous. **Capitula** homogamous, 1–many, solitary or in lax terminal corymbiform cymes. **Involucre** broadly cup-shaped to turbinate-campanulate; florets exerted. **Phyllaries** several-seriate, larger towards inside, appressed imbricate to somewhat spreading, outer ones often grading into bracts or leaves below, glabrous to pubescent. **Receptacle** flat or ± dome-shaped, paleaceous with paleae grading from inner phyllaries and usually exceeding them in length. **Corollas** purple, narrowly funnel-shaped, regularly 5-lobed; lobes sparsely to densely setose. **Anthers** with a small trian-

gular hyaline apical appendage, anther thecae brownish with short acute tails at base. **Style**: arms terete, tapering to apex, hairy. **Cypselas** oblong-turbinate and 4- or 5-ribbed, sometimes somewhat angular and 4–5-sided, setulose to hispid, or glabrous, with scattered large brown cells on sides; pappus 2-seriate, outer series of 5–15 broad or narrow scales, inner series of somewhat larger narrow paleaceous setae.

Species 3, south-central and E trop. Africa; sthn trop. Afr. 3, Zambia, Malawi, Mozambique.

Dichrocephala L'Hér. ex DC.

(Astereae)

Mendonça: 43 (1943); Binns: 31 (1968); Wild: 6 (1975); Fayed: 425 (1979); Beentje: 458 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dicoma Cass.

(Mutisieae)

Mendonça: 140 (1943); Pope: 29 (1992); Jeffrey & Beentje: 13 (2000).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dimorphotheca Vaill. ex Moench

(Calenduleae)

Norlindh: 144 (1978).

Sthn trop. Afr. 1: *Dimorphotheca zeyheri* Sond., Zimbabwe, and sthn Afr.

Distephanus Cass.

(Vernonieae)

Cassini: 151 (1817); Robinson & Kahn: 498 (1986); Jeffrey & Beentje: 156 (2000); Coates Palgrave: 1138 (2002).

Gongrothamnus Steetz; Mendonça: 109 (1943); Merxmüller: 84 (1967). *Vernonia* Schreb. in part; Pope: 69 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Eclipta L.

(Heliantheae)

Mendonça: 89 (1943); Wild: 59 (1967); Binns: 31 (1968); Karis & Ryding: 583 (1994).

Sthn trop. Afr. 1: **Eclipta prostrata* (L.) L. (= *E. alba* (L.) Hassk.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; cosmopolitan weed originally from Asia.

Elephantopus L.

(Vernonieae)

Linnaeus: 814 (1753); Linnaeus: 355 (1754); Philipson: 299 (1938); Mendonça: 37 (1943); Pope: 186 (1992); Bremer: 232 (1994); Jeffrey & Beentje: 280 (2000).

Perennial ± hirsute herbs with annual stems from a woody rootstock; roots many, thong-like; vegetative indumentum sparse to dense, consisting of patent to appressed, stiff, bristle-like hairs. **Stems** 1–several, leafy or scapiform, branching

above. **Leaves** alternate, often basal, sessile, or narrowly attenuate and petiole-like before widening into a ± stem-clasping, ± stem-sheathing base; upper leaves grading into leaf-like bracts. **Capitula** homogamous, few-flowered, many, syncephalous in bracteate glomerules; glomerules terminal on stiff inflorescence branches, laxly corymbiform-cymose tending to subscorpioid-cymose. **Involucre** narrowly ovoid-cylindric; phyllaries few-seriate, ± cartilaginous with pungent apices, strigose to densely hispid or glabrescent. **Receptacle** small, plane. **Corollas** 5-lobed, asymmetric, more deeply cleft on one side. **Anthers** sagittate at base. **Style**: branches linear-terete, hairy. **Cypselas** narrowly turbinate-cylindric, ± 10-ribbed, usually glandular between ribs, setulose; pappus 1-seriate, setae 5–10 with bases broad, scale-like and usually overlapping, gradually or abruptly tapering and subterete, barbellate above.

Species ± 32, N and S America, Australia, Asia, Madagascar, ± 9 from Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Emilia Cass.

(Senecioneae)

Mendonça: 111 (1943); Jeffrey: 908 (1986).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Emiliella S.Moore

(Senecioneae)

Moore: 225 (1918); Mendonça: 113 (1943); Torre: 85 (1975); Lisowski: 409 (1991); Bremer: 501 (1994).

Annual herbs. **Leaves** alternate, simple, sessile to shortly petiolate, oblong-obovate to lanceolate, slightly serrate. **Capitula** discoid, small, solitary, with ± 8 florets, campanulate-cylindric. **Involucre** of 1 series of bracts, ecalyculate. **Receptacle** flat, naked. **Florets** all bisexual, tubular; corolla shorter than ovary, pink to violet. **Style**: branches truncate, penicillate at apex. **Cypselas** linear, ribbed, glabrous. **Pappus** a single linear to linear-ovate scale (reduced bristle?) or 0.

Species 5, sthn trop. Afr., Angola and Zambia.

Engleria O.Hoffm.

(Astereae)

Mendonça: 110 (1943); Merxmüller: 56 (1967).

Adenogonum Welw. ex Hiern: 290 (1898).

Sthn trop. Afr. 1: *Engleria decumbens* (Welw. ex Hiern) Hiern, Angola, and sthn Afr.

Enydra Lour.

(Heliantheae)

Wild: 35 (1967).

Sthn trop. Afr. 1: *Enydra fluctuans* Lour., Zambia, Mozambique, and sthn Afr.

***Erigeron** L.

(Astereae)

Mendonça: 46 (1943); Binns: 32 (1968); Wild: 34 (1975); Beentje: 479 (2002).

Sthn trop. Afr. 1: **Erigeron karvinskianus* DC., Angola, Zimbabwe, Malawi, and sthn Afr.

Erlangea Sch.Bip.

(Vernonieae)

Mendonça: 4 (1943) (most species cited here are now placed under *Bothriocline*); Pope: 160 (1992); Jeffrey & Beentje: 132 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Erythrocephalum Benth.

(Mutisieae)

Bentham: 488 (1873); Mendonça: 139 (1943); Jeffrey: 201 (1967); Wild: 173 (1972b); Pope: 20 (1992); Bremer: 99 (1994); Jeffrey & Beentje: 26 (2000).

Annual herbs, or suffrutices with annual stems from a woody rootstock; vegetative indumentum of appressed, fine, ± matted hairs usually intermixed with large, patent, many-celled uniseriate hairs each bearing a fine filamentous terminal cell. **Stems** 1–several, simple or branching near apex, araneose-lanate to coarsely pubescent. **Leaves** alternate, semi-amplexicaul, usually discolorous, indumentum as for stem but denser on lower surface of lamina, sometimes ± scabrid. **Capitula** heterogamous, discoid or radiate, 1–many, solitary and terminal on stem and branches when present. **Involucre** ± broadly campanulate, ± truncate at base. **Phyllaries** many-seriate, appressed imbricate, the innermost grading into paleae of receptacle. **Receptacle** paleate. **Ray florets** bisexual, with 2-lipped, deep red corollas, outer lip (ray) large, 3-fid, inner lip shorter, consisting of 2 linear lobes, or ray florets absent. **Disc florets** deep red or creamy white, occasionally orange-tinged, bisexual and regular, abruptly dilated from near base into a deeply lobed limb, lobes erect, linear. **Anthers**: bases produced into oblong, fimbriate or ciliolate tails. **Styles** deeply 2-fid, branch apices shortly conical with a sub-distal fringe of hairs. **Cypselas** barrel-shaped to cylindric, ± 5-angled or ribbed, usually with a ± swollen or lobed cartilaginous carpodium at base, minutely puberulous or glabrous; pappus of 4 or 5 caducous barbellate setae.

Species ± 12, trop. Africa; sthn trop. Afr. ± 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Ethulia L.f.

(Vernonieae)

Mendonça: 1 (1943); Pope: 172 (1992); Jeffrey & Beentje: 111 (2000).

Hoehnelia Schweinf.; Wild & Pope: 140 (1978b).

Species 19, trop. Africa and Indomalesia; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Euryops (Cass.) Cass.

(Senecioneae)

Nordenstam: 1 (1968); Jeffrey: 931 (1986).

Sthn trop. Afr. 1: *Euryops transvaalensis* Klatt subsp. *setilobus* (N.E.Br.) B.Nord., Zimbabwe; most species confined to sthn Afr.

Felicia Cass.

(Astereae)

Mendonça: 44 (1943); Grau: 1 (1980); Beentje: 470 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

**Flaveria* Juss.

(Helenieae)

Pope: 111 (1975).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

**Galinsoga* Ruiz & Pav.

(Heliantheae)

Wild: 9 (1967); Binns: 32 (1968).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, and sthn Afr.

**Gamochaeta* Wedd.

(Gnaphalieae)

Anderberg: 155 (1991a); Hind *et al.*: 71 (1993); Anderberg: 357 (1994); Beentje: 401 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 1; **Gamochaeta purpurea* (L.) Cabrera (= *G. pensylvanica* (Willd.) Cabrera; = *Gnaphalium purpureum* L.), Zimbabwe, widespread weed; 5 species naturalised in sthn Afr.

Gazania Gaertn.

(Arctotideae)

Mendonça: 129 (1943); Roessler: 95 (1975); Pope: 252 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Geigeria Griess.

(Inuleae)

Mendonça: 82 (1943); Wild: 53 (1980); Beentje: 340 (2002); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Gerbera L.

(Mutisieae)

Mendonça: 146 (1943); Binns: 32 (1968); Pope: 44 (1992); Jeffrey & Beentje: 8 (2000).

Piloselloides (Less.) Jeffrey; Wild: 202 (1972b).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gnaphalium L.

(Gnaphalieae)

Mendonça: 62 (1943); Wild: 71 (1980); Lisowski: 58 (1989); Beentje: 395 (2002).

Amphidoxa DC.; Mendonça: 61 (1943).

Sthn trop. Afr. ± 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gossweilera S.Moore

(Vernonieae)

Moore: 291 (1908); Mendonça: 39 (1943); Bremer: 221 (1994).

Perennial herbs or shrubs. **Leaves** alternate, lanceolate, entire. **Capitula** discoid, many-flowered, fairly small, arranged in corymbiform cymes. **Involucre** campanulate; bracts free, in many rows. **Receptacle** paleate; paleae spatulate. **Florets** purplish. **Anthers** shortly sagittate at base. **Style branches** filiform. **Cypselas** oblong-ovoid, glabrous. **Pappus** a tubular, membranous cupule.

Species 2, only known from Angola.

Grangea Adans.

(Astereae)

Mendonça: 43 (1943); Wild: 10 (1975); Fayed: 450 (1979); Beentje: 466 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

**Guizotia* Cass.

(Heliantheae)

Wild: 11 (1967); Karis & Ryding: 610 (1994).

Sthn trop. Afr. 1: **Guizotia scabra* (Vis.) Chiov., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gutenbergia Sch.Bip.

(Vernonieae)

Schultz: 119, t. 4 (1840); Mendonça: 2 (1943); Wild & Pope: 347 (1977b); Jeffrey: 249 (1988); Pope: 151 (1992); Bremer: 221 (1994); Jeffrey & Beentje: 121 (2000); Bingham & Smith: 140 (2002). *Paurolepis* S.Moore; Wild & Pope: 346 (1977b).

Annual or perennial herbs with simple to much-branched, erect or decumbent stems; vegetative indumentum of short-stalked, long-armed, symmetrical T-shaped hairs. **Leaves** opposite, at least those on lower stems, alternate or sometimes in whorls of 3, sessile or petiolate, upper surface of lamina sparsely pilose to scabridulous, lower surface closely whitish-silvery araneose-felted. **Capitula** usually small, few to many, laxly arranged in corymbiform cymes, or shortly stalked in small clusters, homogamous. **Involucre** obconic to cyathiform; phyllaries ± diverging, increasing in size to inside, membranous or scarious, usually with subhyaline margins. **Receptacle** plane or alveolate. **Corollas** purple or mauve, regular, narrowly infundibuliform, deeply 5-lobed, usually puberulous, lobes sometimes with acicular bristles and/or T-shaped to Y-shaped hairs. **Anthers** lanceolate-appendiculate at apex, obtuse at base. **Style**: arms linear, hairy. **Cypselas** obovoid-oblong or turbinate, rounded or truncate at apex and ecostate, or 4–6-, or 8–10-ribbed, polished and smooth or with hooked or ± straight, simple or bifid and globose-glandular trichomes. **Pappus** 0, or of a few short, caducous, barbellate setae, or of persistent overlapping scales.

Species ± 20, trop. Africa; sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Gynura Cass.

(Senecioneae)

Cassini: 391 (1825); Mendonça: 111 (1943); Davies: 335 (1978); Bremer: 503 (1994); White *et al.*: 203 (2001).

Crassocephalum Moench in part.

Sthn trop. Afr. 3, Angola, Zambia, Malawi.

Gyrodoma Wild

(Astereae)

Wild: 294 (1974); Wild: 3 (1975); Bremer: 400 (1994).

Annual herbs. **Leaves** alternate, pinnatifid. **Capitula** heterogamous, radiate, solitary, pedunculate. **Involucre** broadly campanulate to patelliform; bracts \pm in 2 series. **Receptacle** hemispheric-conic, nude. **Florets**: ray florets female, in 1 series, white or pale blue; disc florets bisexual, many, yellow. **Anthers** appendiculate at apex. **Style branches** flattened with appendages broadly triangular to ovate and rounded or obtuse at apex. **Cypselas** obovoid, slightly compressed, pubescent. **Pappus** of minute scales.

Monotypic: *Gyrodoma hispida* (Vatke) Wild, only recorded from Mozambique.

Haplocarpha Less.

(Arctotideae)

Mendonça: 129 (1943); Pope: 232 (1992); Bremer: 260 (1994); Halliday & Wilmot-Dear: 286 (2000).

Species 8, Ethiopia, E Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Helianthus L.

(Heliantheae)

Wild: 57 (1967).

Sthn trop. Afr. 2, Mozambique; 3 species naturalised in sthn Afr.

Helichrysopsis Kirp.

(Gnaphalieae)

Hilliard & Burt: 207 (1981); Anderberg: 153 (1991a); Anderberg: 358 (1994).

Monotypic: *Helichrysopsis septentrionale* (Vatke) Hilliard, coastal Mozambique, and sthn Afr.

Helichrysum Mill.

(Gnaphalieae)

Mendonça: 63 (1943); Wild: 191 (1983); Lisowski: 68 (1989); Anderberg: 141 (1991a); Anderberg: 358 (1994); Beentje: 349 (2000b); White *et al.*: 203 (2001); Beentje: 403 (2002); Mapaura & Timberlake: 163 (2002); Msekandiana & Mlangeni: 34 (2002).

Achyrocline (Less.) DC.; Binns: 28 (1968). *Calomeria* partly in sense of Heine: 115 (1967); Lebrun & Stork: 266 (1997). *Humea* in sense of Moore: 112, tab. 5: 1–3 (1911); Wild: 154 (1964b); Mapaura & Timberlake: 172 (2002).

Sthn trop. Afr. \pm 90, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hirpicium Cass.

(Arctotideae)

Roessler: 333 (1959); Roessler: 86 (1975); Pope: 246 (1992); Halliday & Wilmot-Dear: 296 (2000).

Berkheyopsis O.Hoffm.; Mendonça: 130 (1943).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hypericophyllum Steetz

(Helenieae)

Mendonça: 106 (1943); Pope: 104 (1975); Lisowski: 482 (1991).

Sthn trop. Afr. \pm 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Hypochoeris L.

(Lactuceae)

Pope: 192 (1992); Jeffrey & Beentje: 73 (2000).

Sthn trop. Afr. 2, widespread weeds; 4 species naturalised in sthn Afr.

Inula L.

(Inuleae)

Mendonça: 76 (1943); Wild: 38 (1980); Lisowski: 38 (1989); Anderberg: 97 (1991b); Beentje: 322 (2002).

Sthn trop. Afr. \pm 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Inulanthera Källersjö

(Anthemideae)

Källersjö: 539 (1985); Bremer: 455 (1994).

Athanasia L. in part; Mendonça: 108 (1943).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.

Jeffreya Wild

(Astereae)

Wild: 295 (1974); Wild: 5 (1975); Beentje: 476 (2002).

Annual or perennial herbs, slender, erect. **Leaves** proximally opposite, distally alternate, sessile, linear, entire or sparsely serrulate. **Capitula** terminal, solitary, heterogamous and radiate. **Involucre** ovoid; bracts in 1 or 2 rows. **Receptacle** flat to conical, epaleate. **Ray florets** in 1 row, female. **Disc florets** many, bisexual, proximally cylindrical, more distally campanulate and with 5 teeth. **Anthers** 5, obtuse at base, with triangular appendages at apex. **Style** cylindrical; branches flattened, minutely puberulous. **Cypselas** ellipsoid, slightly compressed, smooth and glabrous with slightly ribbed margins. **Pappus** 0 or a minute annular rim.

Species 2, trop. Africa; sthn trop. Afr. 1: *Jeffreya palustris* (O.Hoffm.) Wild, Zambia.

Kleinia Mill.

(Senecioneae)

Jeffrey: 923 (1986); Lisowski: 420 (1991).

Notonia DC.; Mendonça: 113 (1943).

Sthn trop. Afr. \pm 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lactuca L.

(Lactuceae)

Mendonça: 149 (1943); Pope: 196 (1992); Jeffrey & Beentje: 77 (2000);

Kilian: 76 (2001).

Sthn trop. Afr. 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Laggera Benth.

(Plucheeae)

Mendonça: 56 (1943); Anderberg: 161 (1991c); Anderberg: 300 (1994); Beentje: 352 (2002).

Sthn trop. Afr. ± 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Launaea Cass.

(Lactuceae)

Pope 214 (1992); Kilian: 1 (1997); Jeffrey & Beentje: 98 (2000).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Litogyne Harv.

(Plucheeae)

Anderberg: 168 (1991c); Anderberg: 300 (1994); Beentje: 368 (2002).

Epaltes Cass. in part, as to *E. gariepina* (DC.) Steetz; Mendonça: 60 (1943); Wild: 35 (1980).

Monotypic: *Litogyne gariepina* (DC.) Anderb., tropical and sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lopholaena DC.

(Senecioneae)

Jeffrey: 932 (1986); Lisowski: 436 (1991); Bremer: 505 (1994); Coates Palgrave: 1146 (2002); Msekandiana & Mlangeni: 35 (2002).

Othonna L. in part; Mendonça: 126 (1943).

Sthn trop. Afr. 3, Angola, Zambia, Malawi.

Melanthera Rohr

(Heliantheae)

Mendonça: 95 (1943); Wild: 1 (1965); Wild: 48 (1967); Lisowski: 204 (1991); Karis & Ryding: 595 (1994).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Microglossa DC.

(Astereae)

Mendonça: 47 (1943); Wild: 26 (1975); White *et al.*: 203 (2001); Beentje: 481 (2002); Coates Palgrave: 1139 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mikania Willd.

(Eupatorieae)

Mendonça: 42 (1943); Lisowski: 457 (1991); Bremer *et al.*: 647 (1994); White *et al.*: 205 (2001).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mikaniopsis Milne-Redh.

(Senecioneae)

Jeffrey: 878 (1986); Bremer: 505 (1994).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

***Montanoa** La Llave & Lex.

(Heliantheae)

Wild: 57 (1967); Hilliard: 305 (1977); Lisowski: 221 (1991); Karis & Ryding: 583 (1994).

Sthn trop. Afr. 2, Zimbabwe, both originally from Central America; also naturalised in sthn Afr.

Muschleria S.Moore

(Vernonieae)

Moore: 89 (1914); Mendonça: 2 (1943) (as "*Muschlera*"); Bremer: 224 (1994).

Perennial herbs. **Leaves** linear. **Capitula** few-flowered and aggregated to secondary, campanulate or globose heads, which may be solitary or arranged in a corymbose-paniculate synflorescence. **Florets** purple. **Cypselas** obovoid, ± 10-ribbed, glandular between ribs. **Pappus** a short, undulate corona.

Monotypic: *Muschleria angolensis* S.Moore, Angola.

Neojeffreya Cabrera

(Plucheeae)

Cabrera: [160] (1978); Lisowski: 37 (1989); Anderberg: 301 (1994); Beentje: 391 (2002).

Annual herbs, without resin canals. **Leaves** long-decurrent, denticulate to sinuate, woolly-hairy. **Capitula** disciform, small, aggregated in dense terminal glomerules. **Receptacle** paleate; paleae marginally laciniate. **Florets**: outer ones female; central ones perfect. **Cypselas** laterally compressed. **Pappus** of free, barbellate bristles.

Monotypic: *Neojeffreya decurrens* (L.) Cabrera, Madagascar, and sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Nicolasia S.Moore

(Plucheeae)

Mendonça: 59 (1943); Merxmüller: 1 (1954); Wild: 26 (1980); Lisowski: 30 (1989); Beentje: 349 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Nidorella Cass.

(Astereae)

Mendonça: 48 (1943); Wild: 62 (1975); Bremer: 427 (1994); Beentje: 486 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nolletia Cass.

(Astereae)

Wild: 18 (1975); Bremer: 427 (1994).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

Omphalopappus O.Hoffm.

(Vernonieae)

Hoffmann: 234 (1891); Mendonça: 91 (1943); Bremer: 224 (1994).

Perennial herbs. **Leaves** alternate, linear. **Capitula** homogamous, fairly small, crowded, corymbose. **Receptacle** connex, paleate. **Florets** purple. **Cypselas** cylindrical, 5-angular. **Pappus** a short, denticulate corona.

Monotypic: *Omphalopappus newtonii* O.Hoffm., only recorded from Angola.

Osteospermum L.

(Calenduleae)

Mendonça: 129 (1943).

Tripteris Less.; Mendonça: 127 (1943); Norlindh: 146 (1978); Beentje: 531 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Othonna L.

(Senecioneae)

Mendonça: 126 (1943); Hilliard: 513 (1977); Jeffrey: 876 (1986); Bremer: 506 (1994).

Sthn trop. Afr. 4(5), Angola, Zimbabwe, ?Malawi (*Othonna whyteana* Britten), and sthn Afr.

***Parthenium** L.

(Heliantheae)

Wild: 8 (1967); Hilliard: 294 (1977); Karis & Ryding: 622 (1994).

Sthn trop. Afr. 1: **Parthenium hysterothorus* L., Mozambique, and sthn Afr.

Pasaccardoa Kuntze

(Mutisieae)

Kuntze: 354 (1891); Mendonça: 139 (1943) (as *Passacardoa*); Jeffrey: 208 (1967); Wild: 192 (1972b); Pope: 26 (1992); Bremer: 104 (1994); Jeffrey & Beentje: 19 (2000).

Annual herbs, or suffrutices with annual stems from a woody rootstock; vegetative indumentum of fine flagelliform hairs each consisting of an appressed filamentous terminal cell borne on a uniseriate many-celled stalk. **Leaves** alternate, narrowly oblanceolate to elliptic, somewhat discoloured, densely araneose-lanate on undersurface, gland-dotted. **Capitula** heterogamous, radiate, few to many, solitary and terminal on branches sometimes also sessile along branches, subtended by leaf-like bracts. **Phyllaries** many, many-seriate, araneose-lanate to puberulous, at least outer ones subulate-aristate with stiff, squarrose or recurved apices, or lamina straight and pungent. **Receptacle** deeply alveolate; paleae absent. **Ray florets** neuter, stamens and style absent or rudimentary, corollas deep red or creamy white; rays erect, 3-fid, inner lip wanting; ovary rudimentary, pappus of many narrow scales. **Disc florets** deep red or creamy white, bisexual and regular. **Anthers**: apical appendages narrowly triangular, theca bases sagittate with tapering-acute fimbriate or ciliolate

tails. **Style** deeply 2-fid, apices subobtusate with a subdistal fringe of hairs. **Cypselas** subcylindrical, 10-ribbed with many stiff white hairs; pappus several-seriate of many spreading narrowly lanceolate scales.

Species ± 4, trop. Africa; sthn trop. Afr. 3, Angola, Zambia.

Pechuel-Loeschea O.Hoffm.

(Inuleae)

Merxmüller: 135 (1967); Anderberg: 289 (1994).

Pluchea Cass. in part; Wild: 132 (1969a).

Monotypic: *Pechuel-Loeschea leubnitziae* (Kuntze) O.Hoffm., Zimbabwe, and sthn Afr.

Pegolettia Cass.

(Inuleae)

Mendonça: 79 (1943); Wild: 46 (1980); Anderberg: 158 (1986); Beentje: 332 (2002).

Sthn trop. Afr. 1: *Pegolettia senegalensis* Cass., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

***Pentanema** Cass.

(Inuleae)

Anderberg: 100 (1991b); Mesfin Tadesse: 406 (1995); Beentje: 334 (2002).

Vicoa Cass.; Mendonça: 80 (1943); Wild: 45 (1980); Lisowski: 52 (1989).

Sthn trop. Afr. 1: **Pentanema indicum* (L.) Y.Ling, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Philyrophyllum O.Hoffm.

(Gnaphalieae)

Wild: 51 (1980); Anderberg: 43 (1991a); Herman: 107 (1999).

Monotypic: *Philyrophyllum schinzii* O.Hoffm., Angola, Zimbabwe, and sthn Afr.

Phymaspermum Less. emend. Källersjö

(Anthemideae)

Källersjö: 535 (1985); Bremer & Humphries: 94 (1993); Bremer: 451 (1994).

Brachymeris DC.

Sthn trop. Afr. 1: *Phymaspermum athanasioides* (S.Moore) Källersjö, which is possibly conspecific with *P. bolusii* (Hutch.) Källersjö and *P. montanum* (Hutch.) Källersjö (fide Källersjö 1985: 537), Zimbabwe, and sthn Afr.

Pleiotaxis Steetz

(Mutisieae)

Moore: 64 (1927); Mendonça: 133 (1943); Pope: 11 (1992); Jeffrey & Beentje: 21 (2000); Bingham & Smith: 140 (2002).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pluchea Cass.

(Plucheeae)

Mendonça: 58 (1943); Wild: 132 (1969a); Lisowski: 21 (1989); King-Jones: 1 (2001); Beentje: 359 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Porphyrostemma Benth. ex Oliv.

(Plucheeae)

Oliver: 96 (1873); Wild: 33 (1980); Lisowski: 33 (1989); Anderberg: 301 (1994); Beentje: 338 (2002).

Erect, hispid, annual or perennial herbs. **Leaves** alternate, simple, sessile to pseudopetiolate. **Capitula** heterogamous and disciform, solitary or a few together in axils of upper leaves. **Involucral bracts** narrow, in many rows, outermost shortest. **Receptacle** hairy, pitted. **Outer florets** female, very narrowly tubular, with minute lobes. **Inner florets** bisexual, tubular, widening upwards; lobes 5, triangular. **Anthers** saggitate at base. **Style arms** exerted, linear and obtuse at apex. **Cypselas** ellipsoid, hispid or silky with straight hairs. **Pappus** of 5–9 free, ± smooth bristles, sometimes with an additional row of short connate scales.

Species 3, trop. Africa; sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique.

Prenanthes L.

(Lactuceae)

Linnaeus: 797 (1753); Bremer: 185 (1994); Jeffrey & Beentje: 87 (2000).

Perennial herbs. **Leaves** entire or mostly variously lobed-pinnatisect, usually ovate-cordate in outline. **Capitula** slender and rather few-flowered, often pendent, in corymbose to thyrsoid-paniculate, often elongate synflorescences. **Florets** violet, bluish, pink, purple, white, or rarely yellow; corolla glabrous. **Cypselas** terete to narrowly fusiform, 3- or 4-ribbed, glabrous and smooth or scabrid-hispid, not or hardly constricted below apex. **Pappus** of many stout, scabrid-barbellate bristles.

Species ± 30, Asia, N America, Central and S Europe, Canary Islands, Socotra, and trop. Africa; sthn trop. Afr.: ?Angola (fide Brummitt (Unpublished); no other record seen).

Psednotrichia Hiern

(Senecioneae—formerly placed in Astereae)

Hiern: 289 (1898); Mendonça: 42 (1943); Bremer: 430 (1994); Anderberg & Karis: 375 (1995).

Oligothrix DC.; Mendonça: 126 (1943); Bremer: 506 (1994). *Xyridopsis* B.Nord.: 75 (1978).

Small annual herbs. **Leaves** rosulate, linear. **Capitula** discoid. **Involucral bracts** in 1 row. **Florets** yellow. **Cypselas** obovoid, 5-ribbed, glandular. **Pappus** of few, scabrid, soon caducous bristles.

Species 2, Angola.

Pseudoconyza Cuatrec.

(Plucheeae)

Beentje: 357 (2002).

Blumea DC. in part; Wild: 128 (1969a).

Monotypic genus: *Pseudoconyza viscosa* (Mill.) D'Arcy, pantropical weed; sthn trop. Afr.: Zambia, Zimbabwe, Mozambique, and sthn Afr.

Pseudognaphalium Kirp.

(Gnaphalieae)

Hilliard & Burt: 202 (1981); Lisowski: 64 (1989); Anderberg: 146 (1991a); Anderberg: 362 (1994); Beentje: 398 (2002).

Gnaphalium L. in part; Wild: 71 (1980).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Psiadia Jacq.

(Astereae)

Mendonça: 53 (1943); Wild: 23 (1975); Beentje: 514 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

*Pterocaulon Elliott

(Plucheeae)

Elliott: 323 (1823); Wild: 36 (1980); Anderberg: 302 (1994).

Herbs without resin canals. **Leaves** long-decurrent, dentate to serrate. **Capitula** disciform, terminal, forming dense glomerules, or arranged in long, ± dense spikes. **Florets**: outer ones female, filiform; central ones perfect. **Style branches** with acute hairs not reaching the furcation. **Cypselas** ellipsoid, with straight hairs. **Pappus** of free, barbellate bristles.

Species 18, tropics and warm regions of Old and New World; sthn trop. Afr. 1: **Pterocaulon decurrens* (L.) S.Moore, Zambia, Zimbabwe, Malawi, Mozambique.

Pteronia L.

(Astereae)

Hutchinson & Phillips: 277 (1917); Wild: 29 (1975); Bremer: 408 (1994).

Sthn trop. Afr. 1: *Pteronia smutsii* Hutch., only known from type gathering, Zambia; most species confined to sthn Afr.

Pulicaria Gaertn.

(Inuleae)

Wild: 70 (1980); Anderberg: 109 (1991b); Anderberg: 290 (1994).

Sthn trop. Afr. 1: *Pulicaria scabra* (Thunb.) Druce, Zambia, Zimbabwe, and sthn Afr.

Rastrophyllum Wild & G.V.Pope

(Vernonieae)

Wild & Pope: 325 (1977a); Wild & Pope: 345 (1977b); Pope: 172 (1992); Bremer: 225 (1994); Bingham & Smith: 149 (2002).

Annual herbs. **Leaves** alternate, deeply pinnatisect. **Capitula** corymbose, homogamous, subglobose; involucral bracts in 4 or 5 rows; receptacle reticulo-foveolate. **Florets** bisexual, many, violet-purplish, glandular. **Style branches** subulate, hirsute. **Cypselas** obovoid, 4-sulcate, densely tuberculate. **Pappus** absent.

Species 2, Tanzania, and Zambia.

Schistostephium Less.

(Anthemideae)

Hutchinson: 99 (1916); Hilliard: 357 (1977); Lisowski: 242 (1991); Bremer & Humphries: 160 (1993); Bremer: 477 (1994); Beentje: 526 (2002).

Sthn trop. Afr. 7, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Schkuhria Roth

(Helenieae)

Pope: 119 (1975).

Sthn trop. Afr. 1: **Schkuhria pinnata* (Lam.) Thell., Zimbabwe, Mozambique, and sthn Afr.

Sclerocarpus Jacq.

(Heliantheae)

Mendonça: 90 (1943); Wild: 37 (1967).

Sthn trop. Afr. 1: *Sclerocarpus africanus* Jacq. ex Murray, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Senecio L.

(Senecioneae)

Mendonça: 117 (1943); Jeffrey: 879 (1986); White *et al.*: 205 (2001); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sigesbeckia L.

(Heliantheae)

Mendonça: 89 (1943) (as *Siegesbeckia*); Wild: 36 (1967); Karis & Ryding: 612 (1994).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Solanecio (Sch.Bip.) Walp.

(Senecioneae)

Jeffrey: 920 (1986); Coates Palgrave: 1148 (2002).

Crassocephalum Moench in part; Mendonça: 113 (1943).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sonchus L.

(Lactuceae)

Mendonça: 151 (1943); Boulos: 287 (1972); Lawalrée *et al.*: 27 (1986); Pope: 221 (1992); Jeffrey & Beentje: 92 (2000).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sphaeranthus L.

(Plucheeae)

Mendonça: 60 (1943); Wild: 96 (1980); Lisowski: 216 (1989); Beentje: 370 (2002).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Spilanthes Jacq.

(Heliantheae)

Mendonça: 98 (1943); Wild: 60 (1967); Jansen: 231 (1981); Lisowski: 225 (1991).

Species 6, pantropical; sthn trop. Afr. 1: *Spilanthes costata* Benth. (= *S. acmella* (L.) Murray), Angola, and sthn Afr.

Stenops B.Nord.

(Senecioneae)

Nordenstam: 73 (1978); Jeffrey: 908 (1986); Bremer: 509 (1994).

Annual herbs. **Leaves** entire or slightly serrate. **Capitula** radiate, solitary or laxly corymbose, small, few-flowered. **Involucre** ecalyculate; bracts connate. **Receptacle** conical. **Florets**: ray florets white or pale mauve; disc florets perfect, yellow. **Filaments**: collar much dilated. **Cypselas** oblong, 5-ribbed or thickly 5- to 7-winged, glabrous. **Pappus** absent.

Species 2, trop. Africa; sthn trop. Afr. 1: *Stenops helodes* B.Nord., Zambia.

Stoebe L.

(Gnaphalieae)

Mendonça: 76 (1943); Nogueira: 127 (1977); Wild: 67 (1980); Lisowski: 56 (1989); White *et al.*: 207 (2001); Beentje: 452 (2002); Coates Palgrave: 1146 (2002); Phiri (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stomatanthus R.M.King & H.Rob.

(Eupatorieae)

King & Robinson: 430 (1970); Lisowski: 452 (1991).

Eupatorium as to *E. africanum* Oliv. & Hiern; Mendonça: 41 (1943); Binns: 32 (1968).

Species 16, tropical America, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Synedrella Gaertn.

(Heliantheae)

Gaertner: 456 (1791); Mendonça: 98 (1943); Karis & Ryding: 598 (1994); Lisowski: 117 (1991); Turner: 39 (1994).

Annual or short-lived perennial herbs. **Leaves** opposite, crenate-serrate. **Capitula** radiate, glomerate or sometimes solitary. **Involucral bracts** few, in a single row. **Receptacle** with small, narrow paleae. **Florets**: rays female, yellow; disc florets 4-lobed, yellow. **Anthers**: appendages truncate to obtuse. **Cypselas**: ray cypselas elliptic, dorsiventrally compressed, with deeply lobate wings; disc cypselas clavate, tuberculate. **Pappus** in ray florets of 2 awns, connate to the wing; in disc florets of 2 or 3(4) awns.

Monotypic: **Synedrella nodiflora* Gaertn., tropical America, naturalised throughout tropics; sthn trop. Afr.: Angola, Malawi.

*Tagetes L.

(Helenieae)

Mendonça: 107 (1943); Pope: 115 (1975); Lisowski: 491 (1991).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

****Taraxacum* Weber ex F.H. Wigg.**

(Lactuceae)

Pope: 212 (1992); Jeffrey & Beentje: 75 (2000).

Sthn trop. Afr. 1 (aggregate) often referred to as *Taraxacum officinale*, Zambia, Zimbabwe, Mozambique, and sthn Afr.***Tarchonanthus* L.**

(Tarchonantheae)

Mendonça: 54 (1943); Pope: 9 (1992); Beentje: 81 (1999); Jeffrey & Beentje: 6 (2000); Coates Palgrave: 1144 (2002); Herman: 26 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

****Tithonia* Desf. ex Juss.**

(Heliantheae)

Wild: 55 (1967); La Duke: 453 (1982); Karis & Ryding: 605 (1994).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Tolpis* Adans.**

(Lactuceae)

Lawalrée *et al.*: 6 (1986); Pope: 190 (1992); Jeffrey & Beentje: 64 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

****Tridax* L.**

(Heliantheae)

Wild: 10 (1967); Karis & Ryding: 609 (1994).

Sthn trop. Afr. 1: **Tridax procumbens* L., introduced in Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.***Ursinia* Gaertn.**

(Anthemideae)

Prassler: 363 (1967); Bremer & Humphries: 93 (1993); Bremer: 451 (1994); Mapaura (Unpublished).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

****Verbesina* L.**

(Heliantheae)

Wild: 61 (1967).

Sthn trop. Afr. 1: **Verbesina encelioides* (Cav.) A.Gray, Zimbabwe, Mozambique, and sthn Afr.***Vernonia* Schreb.**

(Vernonieae)

Moore: 44 (1927); Mendonça: 5 (1943); Wild: 31 (1978); Pope: 57 (1992); Jeffrey & Beentje: 159 (2000); White *et al.*: 207 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 1132 (2002); Mapaura & Timberlake: 163 (2002). *Herderia* Cass. (1829) in part; Mendonça: 37 (1943). *Triplotaxis* Hutch.; Wild & Pope: 359 (1977b).

Sthn trop. Afr. ± 160, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Welwitschiella* O.Hoffm.**

(Helenieae)

Hoffmann: 390 (1894); Mendonça: 107 (1943); Pope: 103 (1975); Karis & Ryding: 541 (1994).

Perennial herbs. **Leaves** alternate, simple. **Capitula** disciform, paniculate. **Involucral bracts** in 4 or 5 rows. **Receptacle** honeycombed with toothed margins to the pits. **Florets**: marginal ones female, 4-lobed, yellow; disc florets functionally male. **Cypselas**: ray cypselas narrowly obconic, 2- to 6-ribbed. **Pappus** in marginal cypselas of 2–5 irregularly toothed scales.Monotypic: *Welwitschiella nerifolia* O.Hoffm., Angola, Zambia.****Xanthium* L.**

(Heliantheae)

Wild: 3 (1967).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

****Zinnia* L.**

(Heliantheae)

Wild: 54 (1967); Hilliard: 299 (1977); Karis & Ryding: 588 (1994).

Sthn trop. Afr. 1: **Zinnia peruviana* (L.) L., Zimbabwe, and sthn Afr.**References**

- ADAMS, C.D. 1956. A revision of the genera *Aspilia*, *Blainvillea* and *Wedelia* in West Africa. *Webbia* 12: 217–250.
- ADAMS, C.D. 1963. Compositae. *Flora of west tropical Africa*, edn 2, 2: 225–297.
- ANDERBERG, A. 1986. The genus *Pegolettia* (Compositae, Inuleae). *Cladistics* 2: 158–186.
- ANDERBERG, A.A. 1991a. Taxonomy and phylogeny of the tribe Gnaphalieae (Asteraceae). *Opera Botanica* 104: 1–195.
- ANDERBERG, A.A. 1991b. Taxonomy and phylogeny of the tribe Inuleae (Asteraceae). *Plant Systematics and Evolution* 176: 75–123.
- ANDERBERG, A.A. 1991c. Taxonomy and phylogeny of the tribe Pluceaeae (Asteraceae). *Plant Systematics and Evolution* 176: 145–177.
- ANDERBERG, A.A. 1994. Tribes Inuleae, Pluceaeae, Gnaphalieae. In: K. Bremer, *Asteraceae, cladistics & classification*: 273–364. Timber Press, Portland, Oregon.
- ANDERBERG, A.A. & KARIS, P.O. 1995. *Psednotrichia*, a genus of the tribe Senecioneae hitherto misplaced in the Astereae (Asteraceae). *Nordic Journal of Botany* 15: 375–379.
- BAYER, E. 1981. Revision der Gattung *Chrysocoma* (Asteraceae—Astereae). *Mitteilungen der Botanischen Staatssammlung München* 17: 259–392.
- BEENTJE, H.J. 1999. The genus *Tarchonanthus* (Compositae-Mutisieae). *Kew Bulletin* 54(1): 81–95.
- BEENTJE, H.J. 2000a. The genus *Brachylaena* (Compositae: Mutisieae). *Kew Bulletin* 55(1): 1–41.
- BEENTJE, H.J. 2000b. New taxa and new combinations in *Helichrysum* (Compositae: Inuleae). *Kew Bulletin* 55(2): 349–365.
- BEENTJE, H.J. 2002. *Flora of tropical east Africa*. Compositae (Part 2): 315–546.
- BENTHAM, G. 1873. *Erythrocephalum*. In: G. Bentham & J.D. Hooker, *Genera plantarum* 2. Reeve & Co., London.
- BINGHAM, M.G. (Unpublished). Preliminary national check list of Zambia (August 1999). Unpublished manuscript. SABONET, Pretoria.
- BINGHAM, M.G. & SMITH, P.P. 2002. Zambia. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 135–156. SABONET, Pretoria.

- BINNS, B. 1968. *A first check list of the herbaceous flora of Malawi*. Government Printer, Zomba, Malawi.
- BOULOS, L. 1972. Révision systématique du genre *Sonchus* L. s.l. I. Introduction et classification. *Botaniska Notiser* 125: 287–305.
- BREMER, K. 1994. *Asteraceae, cladistics & classification*. Timber Press, Portland, Oregon.
- BREMER, K., ANDERBERG, A.A., KARIS, O. & LUNDBERG, J. 1994. Tribe Eupatorieae. In: K. Bremer, *Asteraceae, cladistics and classification*: 625–680. Timber Press, Portland, Oregon.
- BREMER, K. & HUMPHRIES, C. 1993. Generic monograph of the Asteraceae-Anthemideae. *Bulletin of the Natural History Museum, Botany Series* 23: 71–177.
- BRUMMITT, N. (Unpublished). Check list of seed plants of the FZ area and Angola. Royal Botanic Gardens, Kew.
- CABRERA, A.L. 1978. *Neojeffreya*, nuevo nombre para un género de Compositae de Africa. *Hickenia* 1: 160.
- CANDOLLE, A.P. DE. 1833. *Athroisma*. *Archives de botanique. Paris* 2: 516.
- CANDOLLE, A.P. DE. 1834. *Blepharispermum*. In: R. Wight, *Contributions to the flora of India*. Parbury, Allen & Co., London.
- CASSINI, A.H.G. DE. 1817. *Distephanus*. *Bulletin des sciences, par la Société Philomatique de Paris* 1817: 151.
- CASSINI, A.H.G. DE. 1825. *Gynura*. In: F. Cuvier, *Dictionnaire des sciences*, edn 2, 34. Levrault, Strassbourg.
- CASSINI, A.H.G. DE. 1829. *Herderia*. *Annales de sciences naturelles. Paris* 17: 421.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- DAVIES, F.G. 1978. The genus *Gynura* (Compositae) in Africa. *Kew Bulletin* 33: 335–342.
- ELLIOTT, G.F.S. 1823. *A sketch of the botany of South-Carolina and Georgia*. Schenck, Charleston.
- ERIKSSON, T. 1992. The genus *Blepharispermum* (Asteraceae, Heliantheae). *Plant Systematics and Evolution* 182: 149–227.
- ERIKSSON, T. 1995. The genus *Athroisma* (Asteraceae, Heliantheae). *Botanical Journal of the Linnean Society* 119: 101–184.
- FAYED, A. 1979. Revision der Grangeinae (Asteraceae—Astereae). *Mitteilungen der Botanischen Staatssammlung München* 15: 425–576.
- GAERTNER, J. 1791. *De fructibus et seminibus plantarum* 2. Schramm, Tübingen.
- GAUTIER, L. 1992. Taxonomy and distribution of a tropical weed: *Chromolaena odorata* (L.) R.King & H.Robinson. *Candollea* 47(2): 645–662.
- GRAU, J. 1980. *Felicia*. In: J. Grau & W. Lippert, The Compositae of the *Flora zambesiaca* area 11—Astereae (continued). *Kirkia* 12: 1–9.
- HALLIDAY, P. & WILMOT-DEAR, C.M. 2000. Arctotideae. *Flora of tropical east Africa*. Compositae (Part 1): 285–301.
- HEINE, H. 1967. “Ave Caesar, botanici te salutant”. L’épopée napoléonienne dans la botanique. *Adansonia*, sér. 2, 7(2): 115–140.
- HERMAN, P.P.J. 1999. Asteraceae. A note on the genus *Philyrophyllum*. *Bothalia* 29(1): 107.
- HERMAN, P.P.J. 2002. Revision of the *Tarchonanthus camphoratus* complex (Asteraceae—Tarchonanthae) in southern Africa. *Bothalia* 32(1): 21–28.
- HIERN, W.P. 1898. Two new genera of Compositae. *Journal of Botany* 36: 289–291.
- HILLIARD, O.M. 1977. *Compositae in Natal*. University of Natal Press, Pietermaritzburg.
- HILLIARD, O.M. & BURTT, B.L. 1981. Some generic concepts in Compositae—Gnaphaliinae. *Botanical Journal of the Linnean Society* 82: 181–232.
- HIND, D.J.N., JEFFREY, C. & SCOTT, A.J. 1993. Composées. *Flore de Mascareignes* 109: 1–261.
- HOFFMANN, O. 1891. Compositae. *Die natürlichen Pflanzenfamilien*, edn 1, 4, 5: 225–272.
- HOFFMANN, O. 1894. Compositae. *Die natürlichen Pflanzenfamilien*, edn 1, 4, 5: 369–375, 387–391.
- HOFFMANN, O. 1903. *Dewildmania*. *Annales du Musée du Congo*, sér. 4, 1: x.
- HUTCHINSON, J. 1916. XIX—Notes on African Compositae: I. [*Schistostephium*, Less.]. *Kew Bulletin (Bulletin of Miscellaneous Information)* 1916: 99–104.
- HUTCHINSON, J. & PHILLIPS, E.P. 1917. A revision of the genus *Pteronia* (Compositae). *Annals of the South African Museum* 9: 277–329.
- JANSEN, R.K. 1981. Systematics of *Spilanthes* (Compositae: Heliantheae). *Systematic Botany* 6(3): 231–257.
- JANSEN, R.K. 1985. The systematics of *Acmella* (Asteraceae—Heliantheae). *Systematic Botany Monographs* 8: 1–115.
- JEFFREY, C. 1967. Notes on Compositae: II. The Mutisieae in East Tropical Africa. *Kew Bulletin* 21(2): 177–224.
- JEFFREY, C. 1986. The Senecioneae in East Tropical Africa. Notes on Compositae: IV. *Kew Bulletin* 41(4): 873–943.
- JEFFREY, C. 1988. The Vernonieae in East Tropical Africa. Notes on Compositae: V. *Kew Bulletin* 43: 195–277.
- JEFFREY, C. & BEENTJE, H.J. 2000. Vernonieae. *Flora of tropical east Africa*. Compositae (Part 1): 108–285.
- KÄLLERSJÖ, M. 1985. Fruit structure and generic delimitation of *Athanasia* (Asteraceae-Anthemideae) and related genera. *Nordic Journal of Botany* 5: 527–542.
- KARIS, P.O. & RYDING, O. 1994. Tribes Helenieae and Heliantheae. In: K. Bremer, *Asteraceae, cladistics & classification*: 521–624. Timber Press, Portland, Oregon.
- KILIAN, N. 1997. Revision of *Laumaea* Cass. (Compositae, Lactuceae, Sonchinea). *Englera* 17: 1–478.
- KILIAN, N. 2001. *Lactuca stebbinsii* (Lactuceae, Compositae), a puzzling new species from Angola. *Willdenowia* 31: 71–78.
- KING, R.M. & ROBINSON, H. 1970. Studies in the Eupatorieae (Compositae). XXIV. A new genus *Stomatanthes*. *Phytologia* 19(7): 429–430.
- KING-JONES, S. 2001. Revision of *Pluchea* Cass. (Compositae, Plucheeae) in the Old World. *Englera* 23: 1–136.
- KRONER, G. 1980. Systematische Studien im Umkreis von *Athrixia* Ker-Gawler (Asteraceae). *Mitteilungen der Botanischen Staatssammlung München* 16: 1–268.
- KUNTZE, O. 1891. *Revisio generum plantarum* 1. Felix, Leipzig.
- LA DUKE, J.C. 1982. Revision of *Tithonia*. *Rhodora* 84: 453–522.
- LAWALRÉE, A., DETHIER, D. & GILISSEN, E. 1986. *Flore d’Afrique centrale*. Compositae 1: 1–72.
- LEBRUN, J.-P. & STORK, A.L. 1997. *Énumération des plantes à fleurs d’Afrique tropicale* 4—Gamopétales: Clethraceae à Lamiaceae. Conservatoire et Jardin botaniques de la Ville de Genève, Genève.
- LINNAEUS, C. 1753. *Species plantarum*, edn 1. Salvius, Stockholm.
- LINNAEUS, C. 1754. *Genera plantarum*, edn 5. Salvius, Stockholm.
- LIPPERT, W. 1973. Revision der Gattung *Aster* in Afrika. *Mitteilungen der Botanischen Staatssammlung München* 11: 153–258.
- LIPPERT, W. 1980. *Aster*. In: J. Grau & W. Lippert, The Compositae of the *Flora zambesiaca* area 11—Astereae (continued). *Kirkia* 12: 10–14.
- LISOWSKI, S. 1989. *Flore d’Afrique centrale*. Compositae 2: 1–239.
- LISOWSKI, S. 1991. Les Asteraceae dans la flore d’Afrique centrale. *Fragmenta Floristica et Geobotanica* 36, 1, *Supplementum* 1: 1–627.
- MAPAURA, A. (Unpublished). Check list of the vascular plants of Zimbabwe. Unpublished manuscript. SABONET, Pretoria.

- MAPAURA, A. & TIMBERLAKE, J.R. 2002. Zimbabwe. In: J.S. Golding (ed.), Southern African Plant Red Data Lists. *Southern African Botanical Diversity Network Report No. 14*: 157–182.
- MATTFELD, J. 1932. *Ageratinastrum*. *Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem* 11: 412.
- MENDONÇA, F.A. 1943. *Contribuições para o conhecimento da flora de Angola. I. Compositae* 1, 1: 1–167.
- MERXMÜLLER, H. 1954. Compositen-Studien V. Revision der Gattung *Nicolasia* S. Moore. *Mitteilungen der Botanischen Staatssammlung München* 2: 1–10.
- MERXMÜLLER, H. 1967. Asteraceae. *Prodromus einer Flora von Südwestafrika* 139: 1–185.
- MESFIN TADESSE. 1994. An account of *Bidens* (Compositae: Heliantheae) for Africa. *Kew Bulletin* 48: 437–516.
- MESFIN TADESSE. 1995. New species of *Iphiaea* and *Pentanema* (Compositae—Inuleae) from Somalia with a note on *P. indicum* (L.) Ling in Africa. *Kew Bulletin* 50(2): 401–408.
- MSEKANDIANA, G. & MLANGENI, E. 2002. Malawi. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report No. 14*: 31–42. SABONET, Pretoria.
- MOORE, S. 1908. *Gossweilera*. *Alabastra diversa*—Part XVII. *Journal of Botany* 46: 290–298.
- MOORE, S. 1911. Gamopetalae. In: A.B. Rendle, E.G. Baker, S. Moore & A. Gepp. A contribution to our knowledge of the flora of Gazaland. *Journal of the Linnean Society* 40: 77–180.
- MOORE, S. 1914. *Muschleria*. *Alabastra diversa*—Part XXIII. *Journal of Botany* 52: 89–98.
- MOORE, S. 1918. *Emiliella*. *Alabastra diversa*—Part XXIX. *Journal of Botany* 56: 225–233.
- MOORE, S. 1927. Compositae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 65, Supplement, Gamopetalae: 43–68.
- NOGUEIRA, I. 1977. The genus *Stoebe* (Compositae) in the *Flora zambesiaca* area and Angola. *Boletim da Sociedade Broteriana*, sér. 2, 51: 127–133.
- NORDENSTAM, B. 1968. The genus *Euryops*, Part 1, Taxonomy. *Opera Botanica* 20: 1–409.
- NORDENSTAM, B. 1978. Taxonomic studies in the tribe Senecioneae. *Opera Botanica* 44: 1–83.
- NORLINDH, T. 1965. *Arctotis venusta* T.Norl. spec. nova, an ornamental plant from Southern Africa. *Botaniska Notiser* 118(4): 403–411.
- NORLINDH, T. 1978. The Compositae of the *Flora zambesiaca* area, 10—Calenduleae. *Kirkia* 11: 143–168.
- OLIVER, D. 1873. The botany of the Speke and Grant expedition. *Transactions of the Linnean Society of London* 29: 1–190 + tabs 1–136.
- PERSOON, C.H. 1807. *Synopsis plantarum* 2. Cramer, Paris; Cotta, Tübingen.
- PHILIPSON, W.R. 1938. An enumeration of the African species of *Elephantopus* L. *Journal of Botany* 76: 299–305.
- PHIRI, P.S.M. (Unpublished). A check list of Zambian vascular plants. Unpublished manuscript. SABONET, Pretoria.
- POPE, G.V. 1975. The Compositae of the *Flora zambesiaca* area, 6—Helenieae. *Kirkia* 10: 101–121.
- POPE, G.V. 1992. Compositae. *Flora zambesiaca* 6(1): 1–264.
- PRASSLER, M. 1967. Revision der Gattung *Ursinia*. *Mitteilungen der Botanischen Staatssammlung München* 6: 363–478.
- RANDERIA, A.J. 1960. The Composite genus *Blumea*, a taxonomic revision. *Blumea* 10: 176–317.
- ROBINSON, H. & KAHN, B. 1986. Trinervate leaves, yellow flowers, tailed anthers, and pollen variation in *Distephanus* Cassini (Vernonieae: Asteraceae). *Proceedings of the Biological Society of Washington* 99: 493–501.
- ROESSLER, H. 1959. Revision der Arctotideae—Gorteriinae (Compositae). *Mitteilungen der Botanischen Staatssammlung München* 3: 71–500.
- ROESSLER, H. 1975. The Compositae of the *Flora zambesiaca* area, 5. Subtribe Gorteriinae. *Kirkia* 10: 73–99.
- SCHULTZ, C.H. “Bipontinus” 1840. *Gutenbergia*. *Gedenkbuch zur Jubelfeier der Buchdruckerkunst*. Mainz.
- STEETZ, J. 1864. *Adelostigma*. In: W.C.H. Peters, *Naturwissenschaftliche Reise nach Mossambique*. Reimer, Berlin.
- TORRE, A.R. 1975. Revisão do género *Emiliella* S. Moore (Compositae, Senecioneae). *Garcia de Orta*, sér. Botânica 2, 2: 85–87 + tab. I–III.
- TURNER, B.L. 1988. Taxonomic study of *Chrysanthellum* (Asteraceae, Coreopsideae). *Phytologia* 64: 410–444.
- TURNER, B.L. 1994. Taxonomic study of the genus *Synedrella* (Asteraceae, Heliantheae). *Phytologia* 76: 39–51.
- VENTENAT, É.P. 1804. *Jardin de la Malmaison*, vol. 2. Crapelet (imprim.), Paris.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.
- WILD, H. 1964a. A revision of the genus *Anisopappus* Hook. & Arn. (Compositae). *Kirkia* 4: 45–73.
- WILD, H. 1964b. The endemic species of the Chimanimani Mountains and their significance. *Kirkia* 4: 125–157.
- WILD, H. 1965. The African species of *Melanthera* Rohr. *Kirkia* 5(1): 1–17.
- WILD, H. 1966. The African species of the genus *Aspilia* Thouars. *Kirkia* 5(2): 197–228.
- WILD, H. 1967. The Compositae of the *Flora zambesiaca* area, 1. *Kirkia* 6(1): 1–62.
- WILD, H. 1969a. The Compositae of the *Flora zambesiaca* area, 2. *Kirkia* 7(1): 121–135.
- WILD, H. 1969b. The species of *Conyza* L. with ligulate or lobed ray florets in Africa, Madagascar and the Cape Verde Islands. *Boletim da Sociedade Broteriana*, sér. 2, 43: 247–277.
- WILD, H. 1972a. New and interesting Compositae from South Central Africa, 1. *Kirkia* 8(2): 167–172.
- WILD, H. 1972b. The Compositae of the *Flora zambesiaca* area, 3—Mutisieae. *Kirkia* 8(2): 173–207.
- WILD, H. 1973. A new genus of Compositae (Astereae) from the *Flora zambesiaca* area. *Garcia de Orta*, sér. 2, 1: 67–68 + figs 1–6.
- WILD, H. 1974. New and interesting Compositae from south-central Africa, 2. *Kirkia* 9(2): 293–300.
- WILD, H. 1975. The Compositae of the *Flora zambesiaca* area, 4—Astereae. *Kirkia* 10(1): 1–72.
- WILD, H. 1978. The Compositae of the *Flora zambesiaca* area, 8—Vernonieae (*Vernonia*). *Kirkia* 11(1): 31–127.
- WILD, H. 1980. The Compositae of the *Flora zambesiaca* area, 12—Inuleae. *Kirkia* 12(1): 23–113.
- WILD, H. 1983. New species and new names of *Helichrysum* Mill. from the *Flora zambesiaca* area. *Kirkia* 12(2): 191–198.
- WILD, H. & POPE, G.V. 1977a. New and interesting Compositae from south-central Africa, 3. *Kirkia* 10: 309–338.
- WILD, H. & POPE, G.V. 1977b. The Compositae of the *Flora zambesiaca* area, 7—Vernonieae (excluding *Vernonia* Schreb.). *Kirkia* 10: 339–384.
- WILD, H. & POPE, G.V. 1978a. *Brachythrix*: a new genus of the tribe Vernonieae (Compositae) from south central Africa. *Kirkia* 11: 25–30, 135–139.
- WILD, H. & POPE, G.V. 1978b. The Compositae of the *Flora zambesiaca* area, 9—Vernonieae (*Brachythrix* and *Hoehnelia*). *Kirkia* 11: 133–142.

Avicenniaceae
(Asteridae—Lamiales)
(Euasterids I—Lamiales; included in Acanthaceae)

Retief, E. in Leistner: 171 (2000).

Sthn trop. Afr.: genus 1, species 2.

Avicennia L.

Good & Exell: 146 (1930/1931); Stearn: 34 (1958); Villiers: 59 (1975); Tomlinson: 186 (1986); Verdcourt: 144 (1992) under Verbenaceae; Coates Palgrave: 975 (2002).

Sthn trop. Afr. 2, Angola, Mozambique, and sthn Afr.

References

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern*

Africa, edn 3. Struik, Cape Town.

GOOD, R. & EXELL, A.W. 1930/1931. Verbenaceae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67 & 68, Supplement 1, Gamopetalae: 139–146.

STEARNS, W.T. 1958. A key to West Indian mangroves. *Kew Bulletin* 13: 33–37.

TOMLINSON, P.B. 1986. *The botany of mangroves*. Cambridge University Press, Cambridge etc.

VERDCOURT, B. 1992. *Flora of tropical east Africa*. Verbenaceae: 1–155.

VILLIERS, J.-F. 1975. Avicenniaceae. *Flore du Cameroun* 19: 59–62.

Balanitaceae
(Rosidae—Sapindales)
(Eurosids I; included in Zygophyllaceae)

Archer, R.H. in Leistner: 171 (2000).

Sthn trop. Afr.: genus 1, species 5.

Balanites Delile

Exell & Mendonça: 282 (1951); Launert: 221 (1963); Launert & Paiva: 1 (1969); Sands: 12 (2001); Coates Palgrave: 406 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern*

Africa, edn 3. Struik, Cape Town.

EXELL, A.W. & MENDONÇA, F.A. 1951. Balanitaceae. *Conspectus flora-ae angolensis* 1: 282–283, 396.

LAUNERT, E. 1963. Balanitaceae. *Flora zambesiaca* 2(1): 221–224.

LAUNERT, E. & PAIVA, J. 1969. Balanitaceae. *Flora de Moçambique* 39: 1–5.

SANDS, M.J.S. 2001. The Desert Date and its relatives: a revision of the genus *Balanites*. *Kew Bulletin* 56: 1–128.

Balanophoraceae
(Rosidae—Santalales)
(Unplaced)

Jordaan, M. in Leistner: 172 (2000).

Sthn trop. Afr.: genera 2, species 2.

Identification of additional genus using the key in the above reference: *Thonningia* differs from *Sarcophyte* in having a spadix-like, unbranched inflorescence and a style.

Sarcophyte Sparm.

Hansen: 364 (1986); Hansen: 1 (1993).

Monotypic: *Sarcophyte sanguinea* Sparm., tropical E and S Africa, with 2 subspecies, both in sthn trop. Afr., Zambia, Malawi, Mozambique, and sthn Africa.

Thonningia Vahl

Vahl: 124 (1810); Hansen: 367 (1986); Hansen: 3 (1993).

Dioecious, fleshy, crimson to pink, later brownish root parasite arising from an underground tuber; tuber rhizome-like, cylindrical, branched, swollen at point of contact with host root. **Stem** densely covered with many spirally arranged, triangu-

lar-lanceolate scale leaves; flowering stems breaking through buds on tuber leaving a short-lobed volva at base. **Inflorescence** unbranched, spadix-like with obconic terminally obtuse axis bearing many flowers at apex. **Male flowers** pedicellate; perianth segments 2–6, spirally arranged, linear; anthers 3–6, linear-elongate, united but apices free, 2-theous, dehiscing extrorsely. **Female flowers** densely crowded, linear-prismatic; perianth tubular, obscurely 2- or 3-lobed; style 1, exserted. **Infructescence** a swollen hemisphere, bearing minute, 1-seeded achenes.

Monotypic: *Thonningia sanguinea* Vahl, trop. Africa; sthn trop. Afr.: N Angola, Zambia.

References

HANSEN, B. 1986. The Balanophoraceae of Continental Africa. *Botanische Jahrbücher* 106: 359–377.

HANSEN, B. 1993. *Flora of tropical east Africa*. Balanophoraceae: 1–6.
VAHL, M. 1810. *Thonningia*. *Skrifter af Naturhistorie-Selskabet*. Copenhagen 6: 124.

Balsaminaceae

(Rosidae—Geraniales)
(Asterids—Ericales)

Archer, R.H. in Leistner: 173 (2000).

Sthn trop. Afr.: genus 1, species ± 25.

Impatiens L.

Schulze: 155 (1956); Launert: 162 (1963); Launert & Gonçalves: 2 (1969); Grey-Wilson: 77 (1980); Izidine & Bandeira: 49 (2002); Msekandiana & Mlangeni: 35 (2002); Lebrun & Stork: 338 (2003).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

GREY-WILSON, C. 1980. *Impatiens of Africa*. Balkema, Rotterdam.
IZIDINE, S. & BANDEIRA, S.O. 2002. Mozambique. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 43–60. SABONET, Pretoria.

LAUNERT, E. 1963. Balsaminaceae. *Flora zambesiaca* 2, 1: 162–180.
LAUNERT, E. & GONÇALVES, M.L. 1969. Balsaminaceae. *Flora de Moçambique* 36: 1–23.
LEBRUN, J.-P. & STORK, A.L. 2003. *Tropical African flowering plants. Ecology and distribution*. Volume 1: Annonaceae–Balanitaceae. Éditions des Conservatoire et Jardin botaniques de la Ville de Genève.
MSEKANDIANA, G. & MLANGENI, E. 2002. Malawi. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 31–42. SABONET, Pretoria.
SCHULZE, G.M. 1956. Balsaminaceae. *Conspectus florae angolensis* 2: 155–162.

Basellaceae

(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 173 (2000).

Sthn trop. Afr.: genus 1, species 2.

Basella L.

Verdcourt: 1 (1968); Stannard: 161 (1988).

Sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

References

STANNARD, B.L. 1988. Basellaceae. *Flora zambesiaca* 9(1): 161–163.
VERDCOURT, B. 1968. *Flora of tropical east Africa*. Basellaceae: 1–4.

Begoniaceae

(Dilleniidae—Violales)
(Eurosids I—Cucurbitales)

Bredenkamp, C.L. in Leistner: 174 (2000).

Sthn trop. Afr.: genus 1, species 23.

Begonia L.

Fernandes: 289 (1970); Kupicha: 499 (1978); De Wilde: 1 (1984); De Lange & Bouman: 1 (1992); Klazenga *et al.*: 263 (1994); De Wilde: 13 (2002).

Sthn trop Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

DE LANGE, A. & BOUMAN, F. 1992. Seed micromorphology of the genus *Begonia* in Africa: Taxonomic and ecological implications. *Wageningen Agricultural University Papers* 91, 4: 1–82 (1991). *Belmontia*, n. s. 24.

DE WILDE, J.J.F.E. (ed.) 1984. Studies in Begoniaceae II. *Agricultural University Wageningen Papers* 84, 3: 1–129.
DE WILDE, J.J.F.E. 2002. *Begonia* section *Tetraphila* A.DC. *Wageningen University Papers* 2001, 2: 5–258.
FERNANDES, R. 1970. Begoniaceae. *Conspectus florae angolensis* 4: 289–301, 378–379.
KLAZENGA, N., DE WILDE, J.J.F.E. & QUENÉ, R.J. 1994. *Begonia* sect. *Meziera* (Gaud.) Warb., a taxonomic revision. *Bulletin du Jardin Botanique National de Belgique* 63: 263–312.
KUPICHA, F.K. 1978. Begoniaceae. *Flora zambesiaca* 4: 499–506.

Berberidaceae
(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)

Shrubs, glabrous; branches with 3-partite spines, and short axillary shoots bearing leaves. **Leaves** alternate, usually clustered, sessile, apparently simple but 3-foliolate with a normal terminal leaflet articulated at its base; petiole short, bearing 2 short, subulate leaflets at its apex; lamina of terminal leaflet coriaceous with prickly dentate to entire margin, and midrib produced as a short prickle; petioles and lateral leaflets usually persistent; stipules 0. **Flowers** bisexual, regular, in axillary racemes or little-branched panicles, yellow, sometimes tinged red; bracts small, lanceolate-acuminate. **Perianth**: segments free, in 5 series of 3: 9 outer ones regarded as **sepals**, increasing in size towards centre, 6 inner ones as **petals** (?staminodes), imbricate, each with 2 linear glands near base; petals smaller than inner sepals. **Stamens** 6, opposite petals, free; filaments stout; anthers 2-theous, opening by 2 wing-like apical valves. **Ovary** superior, 1-locular, with few, usually 4, basal, ascending anatropous, bitegmic ovules; stigma broad, capitate, subsessile. **Fruit** an ellipsoid berry with persistent stigma. **Seeds** 1–4, rugulose; endosperm abundant; embryo small.

Genera 15, species 680, north temperate to tropical mountains; sthn trop. Afr.: genus 1, species 1.

Jussieu: 286 (1789); Polhill: 1 (1966); Burger: 78 (1967); Loconte: 147 (1993); Mabberley: 83 (1997); Takhtajan: 90 (1997).

Berberis L.

Linnaeus: 330 (1753); Wild: 171 (1960); Polhill: 1 (1966); Phiri (Unpublished).

Description as for family.

Species ± 500, mostly Eurasia, North Africa, trop. African mountains and the Americas; sthn trop. Afr. 1: *Berberis holstii* Engl., Zambia, Malawi.

References

BURGER, W.C. 1967. *Families of flowering plants in Ethiopia*. Oklahoma State University Press, Stillwater, Oklahoma.

JUSSIEU, A.L. DE. 1789. *Genera plantarum*. Herissant & Barrois, Paris.
LINNAEUS, C. 1753. *Species plantarum*. Salvius, Stockholm.
LOCONTE, H. 1993. Berberidaceae. In: K. Kubitzki, J.G. Rohwer & V. Bittrich, *The families and genera of vascular plants* 2. Springer-Verlag, Berlin.
MABBERLEY, D.J. 1997. *The plant-book*. Cambridge University Press, Cambridge.
PHIRI, P.S.M. (Unpublished). A check list of Zambian vascular plants. Unpublished manuscript. SABONET, Pretoria.
POLHILL, R. 1966. *Flora of tropical east Africa*. Berberidaceae: 1–4.
TAKHTAJAN, A. 1997. *Diversity and classification of flowering plants*. Columbia University Press, New York.
WILD, H. 1960. Berberidaceae. *Flora zambesiaca* 1(1): 171–173.

Bignoniaceae
(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 175 (2000).

Sthn trop. Afr.: genera 10, species 17.

Key to genera

- 1a Flowers in pendulous lax panicles, up to 1(1.5) m long; fruit fibrous-fleshy, sausage-shaped, up to 1 m long, indehiscent; seeds not winged; ovary 1-locular **Kigelia**
- 1b Flowers in erect and shorter panicles or racemes or fasciculate or solitary; fruit capsular; seeds winged; ovary 2-locular:
- 2a Calyx spathe-like; leaves imparipinnate:
- 3a Corolla tube ± 50 mm long, narrowly cylindric, expanding in the throat; corolla white (in Africa only along the S Mozambican coast) **Dolichandrone**
- 3b Corolla tube shorter, campanulate; corolla yellow or greenish yellow, mottled brownish purple **Markhamia**
- 2b Calyx lobed or toothed, not spathe-like; leaves imparipinnate, or 1-jugate or simple:
- 4a Leaves simple, greyish woolly; corolla white, or whitish pink with a long cylindric tube 40–80 mm long; capsule woody with warted valves **Catophractes**
- 4b Leaves imparipinnate, 1-jugate or simple; corolla, if white (*Rhigozum*), with a cylindric tube shorter than 20 mm; capsule neither woody nor warted:
- 5a Capsule cylindric; corolla pale pink or orange to crimson with a yellow throat; leaves appearing after the leaves:
- 6a Corolla 35–55 mm long, pinkish; flowers in large, terminal, pubescent panicles **Stereospermum**
- 6b Corolla ± 80 mm long, orange to crimson with a yellow throat; flowers in short, glabrous, axillary racemes **Fernandoa**
- 5b Capsule compressed; corolla of different colour; leaves and flowers borne at the same time:
- 7a Leaves short, up to 50 mm long, simple, 1-jugate or imparipinnate, clustered on cushions, perfect stamens 5; corolla deep yellow, pink or white; spiny shrubs or small trees **Rhigozum**

- 7b Leaves large, 130–330 mm long, imparipinnate; perfect stamens 4; corolla orange to scarlet or lavender; shrubs or small trees, not spiny:
- 8a Corolla tube curved, narrowly funnel-shaped; stamens exerted; capsule usually 60–120 mm long **Tecomaria**
- 8b Corolla tube straight, cylindric below, campanulate above; stamens included:
- 9a Calyx inflated; scrambling shrubs or subshrubs; flowers pink or lilac **Podranea**
- 9b Calyx not inflated; if shrub then not scrambling; flowers yellow with red lines in the throat ***Tecoma**

Catophractes D. Don

Diniz: 70 (1988); Diniz: 17 (1993); Coates Palgrave: 1009 (2002).

Monotypic genus: *Catophractes alexandri* D. Don, Angola, Zimbabwe, and sthn Afr.

Dolichandrone (Fenzl) Seem.

Seemann: 31 (1862) conserved name; Diniz: 72 (1988); Diniz: 15 (1990); Coates Palgrave: 1010 (2002); Izidine & Bandeira: 49 (2002).

Unarmed shrubs or trees. **Leaves** opposite, imparipinnate, deciduous. **Flowers** borne in terminal panicles, racemes or racemose panicles, fragrant, opening during night. **Calyx** spathaceously splitting along posterior side, beaked at apex. **Corolla** campanulate; tube narrowly cylindric, long, exceeding calyx; lobes 5, subequal, wavy at margin. **Stamens** 4, didynamous; anthers included, introrse, glabrous; staminode present, very small. **Disc** annular, thick. **Ovary** oblong, cylindric, 2-locular; ovules many, pluriseriate. **Capsule** narrowly linear in outline, terete or compressed parallel to false septum, straight or curved, bivalved, loculicidally dehiscent. **Seeds** flat, winged, 1–several on each side of wing.

Species ± 8, tropical Asia, Australia, Africa; sthn trop. Afr. 1: *Dolichandrone alba* (Sim) Sprague, known only from S Mozambique.

Fernandoa Welw. ex Seem.

Seemann: 330 (1865) as *Ferdinandia*; Diniz: 81 (1988); Diniz: 28 (1990); Diniz: 26 (1993); Bidgood: 381 (1994); Coates Palgrave: 1013 (2002); Mapaura & Timberlake: 163 (2002).

Shrubs or trees. **Leaves** opposite, imparipinnate, frequently absent at flowering time. **Flowers** large, in short, few-flowered racemes or solitary, borne praecociously and in axils of fallen leaves. **Calyx** campanulate, irregularly 3–5-lobed, opening just before corolla anthesis. **Corolla** large, showy, brownish red to orange-red or yellow, broadly cup-shaped; tube short, narrowing abruptly into calyx; limb slightly bilabiate. **Stamens** 4, slightly exerted; staminode 1; thecae divaricate. **Disc** cupular. **Ovary** cylindric, narrow, bilocular; ovules pluriseriate in each locule. **Capsule** subcylindric, dehiscing at right angles to the thin flat septum. **Seeds** many, compressed, with hyaline wings.

Species 8, 3 from Madagascar, 5 from African mainland; sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique.

Kigelia DC.

White: 379 (1962); Diniz: 83 (1988); Diniz: 31 (1990); Diniz: 29 (1993); Coates Palgrave: 1013 (2002); Houghton: 14 (2002).

Monotypic genus: *Kigelia africana* (Lam.) Benth., trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Markhamia Seem. ex Bail.

White: 379 (1962); Diniz: 72 (1988); Diniz: 18 (1990); Diniz: 21 (1993);

Coates Palgrave: 1011 (2002).

Muenteria Seem.: 329 (1865).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Podranea Sprague

Diniz: 79 (1988); Diniz: 26 (1990); Coates Palgrave: 1007 (2002).

Sthn trop. Afr. 1: *Podranea brycei* (N.E.Br.) Sprague, Zimbabwe, Malawi, Mozambique. Genus also present in sthn Afr.

Rhigozum Burch.

Giess: 31 (1968); Diniz: 67 (1988); Diniz: 13 (1990); Diniz: 13 (1993); Coates Palgrave: 1008 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Stereospermum Cham.

Chamisso: 720 (1833); White: 379 (1962); Diniz: 77 (1988); Diniz: 23 (1990); Diniz: 26 (1993); Coates Palgrave: 1012 (2002).

Glabrous or pubescent trees or shrubs. **Leaves** opposite, imparipinnate. **Inflorescence** terminal, many-flowered, large panicles. **Calyx** campanulate or tubular, irregularly 2–5-lobed. **Corolla** slightly irregular, pink; tube infundibuliform; lobes patent. **Stamens** 4, didynamous, arising in corolla tube, included; anther thecae divergent; staminode 1, ± developed. **Disc** entire or 5-lobed. **Ovary** bilocular, linear-oblong, 4-angled. **Ovules** many, 2-seriate. **Capsule** linear-cylindric. **Seeds** many, winged, rectangular in outline, arranged alternately along both sides of septum.

Species 15, Old World tropics; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

*Tecoma Juss.

Diniz: 61 (1988); Diniz: 4 (1990); Brummitt: 421 (1992); Maberley: 702 (1997); Bingham (Unpublished).

**Tecoma stans* (L.) Juss. ex Kunth from C and S America is widely cultivated, and may become invasive. Also present in sthn Afr.

Tecomaria (Endl.) Spach

Spach: 137 (1840); White: 380 (1962); Diniz: 64 (1988); Diniz: 9 (1990); Diniz: 13 (1993); Bingham (Unpublished); Coates Palgrave: 1007 (2002); Phiri (Unpublished).

Straggling, many-stemmed shrubs with scandent branches, or small trees. **Leaves** opposite, imparipinnate; rachis narrowly winged; leaflets 2–6-jugate, ovate to elliptic. **Flowers** in terminal racemes or racemose panicles. **Calyx** campanulate, 5-lobed ± to middle of tube; lobes broadly triangular. **Corolla**: tube narrowly funnel-shaped, almost cylindric, curved; corolla limb bilabiate, 5-lobed, orange to scarlet. **Stamens** didynamous, exerted; filaments adnate to corolla up to about

middle of tube, pubescent-glandular at base; thecae connate in upper third, slightly divergent below. **Disc** cupular. **Ovary** bilocular; ovules many, 4-seriate in each locule. **Capsule** linear-oblong in outline, compressed, dehiscing at right angles to septum. **Seeds** with membranous wings, \pm rectangular in outline.

Monotypic genus: *Tecomaria capensis* (Thunb.) Spach, sthn trop. and sthn Afr.; 2 subspecies occur in the region: subsp. *capensis* in Mozambique, and subsp. *nyassae* (Oliv.) Brummitt in NE Angola, Zambia, Malawi, Mozambique and sthn Afr.; subsp. *capensis* is widely cultivated as ornamental in the tropics and subtropics.

References

- BIDGOOD, S. 1994. Synopsis of the continental African species of *Fernandoa* (Bignoniaceae). *Kew Bulletin* 49: 381–390.
- BINGHAM, M.G. (Unpublished). Preliminary national check list of Zambia (August 1999). Unpublished manuscript. SABONET, Pretoria.
- BRUMMITT, R.K. 1992. *Vascular plant families and genera*. Royal Botanic Gardens, Kew.
- CHAMISSO, L.K.A. VON. 1833. Bignoniaceae. *Linnaea* 7: 653–726.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- DINIZ, M.A. 1988. Bignoniaceae. *Flora zambesiaca* 8(3): 61–85.
- DINIZ, M.A. 1990. Bignoniaceae. *Flora de Moçambique* 120: 1–37.
- DINIZ, M.A. 1993. Bignoniaceae. *Conspectus florum angolensis* 122: 1–33.
- GIESS, W. 1968. Die Gattung *Rhigozum* Burch. und ihre Arten in Südwestafrika. *Dinteria* 1: 31–51.
- HOUGHTON, P.J. 2002. The sausage tree (*Kigelia pinnata*): ethnobotany and recent scientific work. *South African Journal of Botany* 68: 14–20.
- IZIDINE, S. & BANDEIRA, S.O. 2002. Mozambique. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 43–60. SABONET, Pretoria.
- MABBERLEY, D.J. 1997. *The plant-book*. Cambridge University Press, Cambridge.
- MAPAURA, A. & TIMBERLAKE, J.R. 2002. Zimbabwe. In: J.S. Golding (ed.), Southern African Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 157–182.
- PALISOT DE BEAUVOIS, A.M.F.J. 1805. *Flore d'Oware* 1. Fain jeune (Imprimerie), Paris.
- PHIRI, P.S.M. (Unpublished). Check list of Zambian vascular plants. Unpublished manuscript. SABONET, Pretoria.
- SEEMANN, B.C. 1862. *Dolichandrone*. *Annals and magazine of natural history, including zoology, botany and geology*. London, ser. 3, 10: 31.
- SEEMANN, B.C. 1865. Welwitschii iter angolense V. *Journal of Botany* 3: 329–333.
- SPACH, É. 1840. *Histoire naturelle des végétaux* 9. Librairie encyclopédique de Roret, Paris.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press, Oxford.

*Bixaceae

(Dilleniidae—Malvales)

(Eurosids II—Malvales)

Shrubs or small trees with reddish to orange juice; branches and rachis of inflorescence covered with rusty scales. **Leaves** alternate, simple, ovate, entire, 5-nerved from base; petioles long, erect, with pulvinus at apex and base; stipules paired, very soon caducous leaving a horseshoe-shaped scale-like scar with a sessile gland on either side of petiole base. **Flowers** bisexual, regular, in terminal panicles or corymbs; pedicels with 5 or 6 apical glands. **Sepals** 4 or 5, free, imbricate in bud, caducous. **Petals** 4–7, free, imbricate in bud, unequal. **Stamens** many, arising on an annular disc; filaments free; anthers 2-theous, horseshoe-shaped, opening by pore-like slits. **Ovary** superior, 1-locular, usually bristly; ovules many, anatropous, bitegmic, on 2 parietal placentas; style 1; stigma very shortly 2-lobed. **Fruit** a 2(3)-valved, loculicidal capsule with dense, stiff, slender bristles; valves thick, with placenta in middle. **Seeds** many; testa covered with minute, red, sessile glands; embryo large, embedded in copious starchy endosperm.

Genera 3, species 16, pantropical; sthn trop. Afr.: genus 1, species 1, cultivated.

Link: 371 (1831); Exell & Mendonça: 382 (1937 & 1951); Wild: 260 (1960); Bridson: 1 (1975); Wild & Vidigal: 1 (1993); Mabberley: 89 (1997).

*Bixa L.

Linnaeus: 512 (1753); Exell & Mendonça: 77 (1937/1951); Wild: 261 (1960); White: 263 (1962); Bridson: 1 (1975); Villiers: 63 (1975); Wild & Vidigal: 7 (1993).

Description as for family.

Monotypic genus: **Bixa orellana* L., ornamental shrub and hedge plant, native to tropical America, widely cultivated in warmer parts of Africa, and recorded as naturalised in Angola, Zimbabwe and Mozambique.

References

- BRIDSON, D.M. 1975. *Flora of tropical east Africa*. Bixaceae: 1–3.
- EXELL, A.W. & MENDONÇA, F.A. 1937/1951. Bixaceae. *Conspectus florum angolensis* 1: 77, 382.
- LINK, J.H.F. 1831. *Handbuch* 2. Josephy, Berlin.
- LINNAEUS, C. 1753. *Species plantarum*, edn 1. Salvius, Stockholm.
- MABBERLEY, D.J. 1997. *The plant-book*. Cambridge University Press, Cambridge.
- VILLIERS, J.-F. 1975. Bixaceae. *Flore du Cameroun* 19: 63–66.
- WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press, Oxford.
- WILD, H. 1960. Bixaceae. *Flora zambesiaca* 1(1): 260–261.
- WILD, H. & VIDIGAL, P. 1993. Bixaceae. *Flora de Moçambique* 15: 7–9.

Boraginaceae

(Asteridae—Lamiales)

(Euasterids I)

Retief, E. in Leistner: 178 (2000).

Sthn trop. Afr.: genera 11, species 63.

Key to genera

[adapted from Martins (1990)]

- 1a Trees or shrubs; style terminal:
- 2a Fruit dry, divisible into two 2-seeded mericarps; style almost absent; stigma 1, ring-like, subterminal **Argusia**
- 2b Fruit fleshy; style well-developed; stigmas 2 or 4, or 1 bilobed, not as above:
- 3a Style with each branch again divided; stigmas 4, slender or clavate **Cordia**
- 3b Style cleft or subentire; stigmas 2, subcapitate or peltate, or 1 bilobed:
- 4a Calyx shortly lobed or dentate; corolla lobes rounded; endocarp with thin longitudinal lamellas **Bourreria**
- 4b Calyx lobed to near base; corolla lobes oblong or lanceolate; endocarp with small surface cavities **Ehretia**
- 1b Herbs or subshrubs; style terminal or gynobasic:
- 5a Ovary entire or subentire; style terminal:
- 6a Styles 2; stigmas capitate; flowers 4-merous, solitary, extra-axillary **Coldenia**
- 6b Style 1; stigma ring-like below the apex of the style; flowers 5-merous, in scorpioid spikes or solitary **Heliotropium**
- 5b Ovary deeply lobed; style gynobasic:
- 7a Corolla throat naked:
- 8a Flowers irregular; anthers without prolonged connectives ***Echium**
- 8b Flowers regular; connectives prolonged above the anthers by lamellate appendages:
- 9a Appendages of the anthers twisted; gynobase pyramidal; calyx strongly accrescent in fruit **Trichodesma**
- 9b Appendages of the anthers straight; gynobase flat; calyx not or only slightly accrescent in fruit **Cystostemon**
- 7b Corolla throat with folds or fornices:
- 10a Nutlets ovoid (circular in cross section) erect, smooth, attached to the gynobase by the base; cymes conspicuously bracteate ... **Lithospermum**
- 10b Nutlets ovoid-depressed (elliptic in cross section), covered with glochidiate spines, attached to the gynobase by the upper part; cymes not bracteate **Cynoglossum**

Argusia Boehm.

Boehmer: 507 (1760); Martins: 81 (1990); Martins: 44 (1993b).

Small trees, shrubs or perennial herbs. **Leaves** entire, sessile or shortly petiolate. **Inflorescence** of scorpioid ebracteate cymes arranged in terminal corymbs or panicles. **Flowers** 5-merous, sessile or pedicellate. **Calyx** 5-lobed almost to base. **Corolla** regular, infundibuliform or hypocrateriform; limb deeply 5-lobed. **Stamens** included, sometimes reaching as far as throat or a little further, free. **Nectary** absent or minute. **Ovary** 4-locular; ovules solitary, pendulous; style terminal; stigmatic ring topped by an entire to 2-lobed stigmatic appendix. **Fruit** dry, dividing at maturity into two 2-seeded, corky mericarps; the 2 fertile cells of each mericarp separated by a deep groove or a sterile cavity.

Species ± 5, America, West Indies, Europe, temperate Asia; sthn trop. Afr. 1: *Argusia argentea* (L.f.) Heine, Mozambique.

Bourreria P.Browne

Browne: 168 (1756); Martins: 72 (1990); Martins: 30 (1993b).

Trees or shrubs. **Leaves** alternate, sometimes crowded, petiolate, simple, usually entire. **Inflorescences** paniculate or corymbose, sometimes few-flowered, terminal but sometimes apparently lateral. **Flowers** bisexual, regular, subsessile or pedicellate. **Calyx** campanulate, closed in bud, 2–5-lobed. **Corolla**: tube usually campanulate; lobes 5, frequently rounded, spreading or reflexed. **Stamens** 5, arising on corolla tube, included or exserted; anthers oblong, on short filaments. **Ovary** 2(4)-locular, conical; style terminal on ovary, entire or very shortly bifid; stigmas 2, capitate or peltate, or 1, bilobed. **Fruit** drupaceous, subglobose; pyrenes 4, bilocular, 1-seeded, outer surface with thin woody lamellas.

Species ± 50, mostly in Central America and West Indies, 5 in Africa; sthn

trop. Afr. 2, Mozambique.

Coldenia L.

Linnaeus: 125 (1753); Good: 107 (1929); Taton: 25 (1971); Martins: 79 (1990); Martins: 42 (1993b).

Annual herbs; stems usually procumbent, branched, angular or ± laterally compressed, densely hairy to villous. **Leaves** alternate, usually many, oblong to almost circular, crenate or lobate, subsessile or petiolate. **Flowers** bisexual, 4-merous, solitary, extra-axillary, upper ones on leafy spicate branches. **Calyx** deeply lobed. **Corolla** regular, small, naked. **Stamens** arising below middle of corolla tube, included. **Nectary** absent. **Ovary** 4-locular, with 1 pendulous ovule per locule; styles 2, slightly united below, terminal; stigmas punctate. **Fruit** dry or slightly succulent, ovoid-pyramidal, 4-lobed, usually separating into 4 1-seeded nutlets. **Seeds** ovoid.

Monotypic genus: *Coldenia procumbens* L., occurring in the tropical regions of Africa, Asia and Australia; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Mozambique.

Cordia L.

Good: 106 (1929); Taton: 3 (1971); Martins: 60 (1990); Warfa: 649 (1990); Martins: 6 (1993b); White *et al.*: 173 (2001); Coates Palgrave: 965 (2002).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cynoglossum L.

Good: 108 (1929); Martins: 102 (1990); Martins: 70 (1993b).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cystostemon Balf.f.

Balfour: 82 (1883); Miller & Riedl: 1 (1982); Martins: 99 (1990); Bingham & Smith: 140 (2002).

Vaupelia Brand; Good: 108 (1929); Taton: 46 (1971).

Annual or perennial herbs or subshrubs. **Leaves** alternate, entire. **Inflorescence** a large panicle. **Calyx** 5-lobed, divided almost to base, sometimes accrescent in fruit. **Corolla**: tube short, cylindric or slightly funnel-shaped, without scales in throat; lobes 5, usually much longer than tube. **Stamens** 5, arising on corolla tube; filaments short, oblong, with a basal ciliate or hairy appendage; anthers much longer than filaments, prolonged above thecae by laminar appendages, straight, not twisted, coherent along their margins. **Ovary** 4-lobed; style gynobasic, elongated; stigma capitate, small. **Fruit** of 1–4 nutlets attached to flat gynobase only by the base.

A genus of 13 species, 1 confined to Socotra, 1 in SW Arabian Peninsula, the rest in NE and E Africa, and Zaire; and 4 in sthn trop. Afr.: Angola and Zambia.

***Echium L.**

Martins: 59 (1990); Verdcourt: 81 (1991).

Sthn trop. Afr. 1: **Echium plantagineum* L., naturalised in disturbed areas; reported from Angola, Zimbabwe, and sthn Afr.

Ehretia P.Browne

Good: 107 (1929); Taton: 19 (1971); Martins: 75 (1990); Martins: 34 (1993b); Retief & Van Wyk: 9 (2001); White *et al.*: 175 (2001); Coates Palgrave: 971 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heliotropium L.

Taton: 28 (1971); Martins: 83 (1990); Verdcourt: 50 (1991); Martins: 47 (1993b).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lithospermum L.

Martins: 108 (1990); Verdcourt: 77 (1991).

Sthn trop. Afr. 1: *Lithospermum afromontanum* Weim., Zambia, Zimbabwe, Malawi, and sthn Afr.

Trichodesma R.Br.

Taton: 36 (1971); Brummitt: 429 (1982); Brummitt: 94 (1990); Brummitt & Martins: 61 (1993); Martins: 5 (1993a).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

References

- BALFOUR, I.B. 1883. *Cystostemon*. *Proceedings of the Royal Society of Edinburgh* 12: 82.
- BINGHAM, M.G. & SMITH, P.P. 2002. Zambia. In: J.S. Golding (ed.), Southern African plant Red Data Lists. *Southern African Botanical Diversity Network Report* No. 14: 135–156. SABONET, Pretoria.
- BOEHMER, G.R. 1760. *Argusia*. In: C.G. Ludwig, *Definitiones generum plantarum*, edn 3. Gleditsch, Leipzig.
- BROWNE, P. 1756. *The civil and natural history of Jamaica in three parts*. Published by the author, London.
- BRUMMITT, R.K. 1982. A revision of *Trichodesma* sect. *Friedrichsthalia* (Fenzl) A.DC. non Brand (Boraginaceae). *Kew Bulletin* 37(3): 429–450.
- BRUMMITT, R.K. 1990. *Trichodesma*. *Flora zambesiaca* 7(4): 94–99.
- BRUMMITT, R.K. & MARTINS, E. 1993. *Trichodesma*. *Flora de Moçambique* 112: 61–70.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- GOOD, R. 1929. Boraginaceae. Mr. John Gossweiler's Portuguese West African plants. *Journal of Botany* 67, Supplement 1: Gamopetalae: 106–108.
- LINNAEUS, C. 1753. *Species plantarum*, edn 1. Salvius, Stockholm.
- MARTINS, E.S. 1990. Boraginaceae (in part). *Flora zambesiaca* 7(4): 59–94, 99–114.
- MARTINS, E.S. 1993a. Sobre a ocorrência de *Trichodesma ambacense* subsp. *hockii* em Angola. *Garcia de Orta, sér. Botânica* 11(1–2): 5–8.
- MARTINS, E. 1993b. Boraginaceae (except *Trichodesma*—see BRUMMITT, R.K. & MARTINS, E. 1993). *Flora de Moçambique* 112: 1–77.
- MILLER, A.G. & RIEDL, H. 1982. A revision of *Cystostemon* Balf.f. (Boraginaceae). *Notes from the Royal Botanic Garden Edinburgh* 40(1): 1–21.
- RETIEF, E. & VAN WYK, A.E. 2001. The genus *Ehretia* (Boraginaceae: Ehretioideae) in southern Africa. *Bothalia* 31(1): 9–23.
- TATON, A. 1971. *Flore du Congo du Rwanda et du Burundi*. Spermatophytes. Boraginaceae: 1–82.
- VERDCOURT, B. 1991. *Flora of tropical east Africa*. Boraginaceae: 1–124.
- WARFA, A.M. 1990. Taxonomy and distribution of *Cordia sinensis* and *C. nevillei* (Boraginaceae), a widespread species pair in Africa and Asia. *Nordic Journal of Botany* 9: 649–656.
- WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

**Brassicaceae
(Cruciferae)**

(Dilleniidae—Capparales)
(Eurosids II—Brassicales)

Dreyer, L.L. & Jordaan, M. in Leistner: 184 (2000).

Sthn trop. Afr.: genera 11, species 22.

Key to genera

- 1a Fruit less than 3x as long as broad (a silicule):
 2a Fruit with more than 2 seeds, obtriangular ***Capsella**
 2b Fruit with 2 seeds, 1 in each locule, elliptic to suborbicular or of 2 suborbicular halves: