

The Cucurbitaceae of Southern Africa

By

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A few years ago the National Chemical Laboratory, Pretoria, in co-operation with the Division of Horticulture, started an investigation into the nature of the bitter principles contained in the fruits and other parts of many species of the Cucurbitaceae and the genetical implications⁽¹⁾ in connection with the incidence and occurrence of these substances in certain horticultural varieties and their related wild forms. Later biochemical studies of the bitter substances and the enzymes associated with them were undertaken.⁽²⁾

The Division of Botany was requested to co-operate by assisting with the purely botanical (taxonomic) side of the study so as to relate a certain bitter substance with the correct scientific name of the plant it was extracted from.⁽³⁾ It was decided not to restrict the taxonomic work to the species or genera that were known to produce bitter fruits but to revise the whole family as represented in Southern Africa. This was justified not only because, for reasons explained below, the family was badly in need of revision, but also because bitter principles appear to be of a much more common occurrence in the Cucurbitaceae than was originally expected, which widened the scope of the biochemical and genetical studies considerably, and consequently necessitated the proper identification of more species.

PREVIOUS TAXONOMIC STUDIES OF THE CUCURBITACEAE OF SOUTHERN AFRICA

If one disregards the few species described by Linnaeus, Berg, Lamarck and some other early authors, the first important contributions are found in Thunberg's publications. Thunberg described 10 species from the Cape Province and, including the previously described ones, recognised about 15 species from this area. Although more recent studies reduced most of Thunberg's names to synonyms, his specific names were adopted by Seringe in DC., Prodr. 3, published in 1828, who added very little to our knowledge. Schrader and Naudin later described a few more species but it was not until 1862 when Sonder treated the family in Vol. 2 of the Flora Capensis that a more comprehensive survey of all species known up to that time was given. Sonder described several new species.

Similarly, the Cucurbitaceae of Tropical Africa were treated by J. D. Hooker in Flora of Tropical Africa, Vol. 2 (1871). Some of the species included in this work have later been recorded from Southern Africa, notably in South West Africa, Bechuanaland and the northern Transvaal.

In 1881 A. Cogniaux monographed the whole family in A. and C. de Candolle's "Monographiae Phanerogamarum" and this author remained for many years the recognised expert. In 1916 his treatment of a part of the family (Fevilleae and

⁽¹⁾ Enslin, Joubert and Rehm, J. S. Afr. Chem. Inst. 7: 131-138 (1954).

⁽²⁾ Enslin, Joubert and Rehm, J. Sci. Food Agric. 7: 646-655 (1956).

⁽³⁾ Rehm, Enslin, Meeuse and Wessels, J. Sci. Food Agric. 8: 679-686 (1957).

Melothriaceae) was published as Vol. IV, 275, I, of "Das Pflanzenreich" and his manuscript of another part (Cucurbitaceae—Cucurbitaceae—Cucumerinae), after having been edited and revised by Harms, was posthumously published in 1924 as Vol. IV, 275, II, of the same work. These last two monographs include all but one of the genera occurring in the area under discussion.

PRESENT POSITION

Although comparatively recent monographs were available, preliminary studies indicated that a new revision was desirable. Not only are the two treatments in "Das Pflanzenreich" (as in most volumes of this work) based on a study of a very limited number of herbarium specimens of each species recognised therein, so that the specific limits are often drawn too narrow, but also the nomenclature needed looking into. In addition it was found that Cogniaux described well-known older species, including some of his own, again under a different name and sometimes in a different genus. Although this can be explained in some cases as a result of incomplete specimens or extreme variability, others among his type specimens are quite adequate and can without difficulty be identified as belonging to some older and often well-known species. One naturally feels a great deal of diffidence when criticizing a recognised authority, but after careful consideration and a study of many types or isotypes, most of which had been annotated by Cogniaux himself, it is felt that in several genera a drastic reduction in the number of species is indicated and that a few genera recognised by Cogniaux cannot be maintained.

There is another reason why the number of species in certain genera treated by Cogniaux in his monographs must be reduced. As in some other families with a similar type of vegetative growth and occurring in similar habitats, notably in Convolvulaceae, the leaf-shape of many representatives of the Cucurbitaceae varies enormously, from undissected, faintly lobed or angled to deeply dissected. This condition is often encountered in one individual, e.g., the leaves of the young plants, i.e., also the lowermost leaves, are undivided, whereas those formed later become more dissected as the plant grows older, or in other cases the leaf-shape depends on the conditions of growth: the leaves on creeping stems sometimes have entire or slightly dissected leaves whereas the uppermost parts of the climbing stems of the same individual can be deeply dissected. Specimens taken from different portions of the same individual or from an old and a young plant may, therefore differ considerably in appearance and also a creeping specimen need not at once be associated with a specimen taken from climbing plants of the same species. In doubtful cases cultivation of plants from seed and regular observation of specimens growing under different conditions provide the final proof. Many of the species mentioned below were grown from seed at the Division of Botany, Pretoria, by the present author or on the Experimental Farm of the Division of Horticulture at Roodeplaats near Pretoria by Dr. S. Rehm and observations on the living plants complemented the herbarium and field studies.

Apart from the material of the National Herbarium, Pretoria, the specimens of all the important South African herbaria, the Government Herbarium at Salisbury, Southern Rhodesia, and the herbaria of Brussels, Coimbra and Leiden were studied. An important collection containing many types was received on loan from Zurich and a small set of the more recent Dinter collections was borrowed from Berlin-Dahlem. Thanks are due to the Directors of all these herbaria for their kind co-operation. Where quoted in the text the herbaria are indicated by the standard abbreviations of the Index Herbariarum.

Special thanks are due to Mr. D. J. B. Killick, our Liaison Officer then at Kew, who compared several types at Kew and the British Museum (Nat. Hist.), and was most helpful in providing abstracts of the literature not available in Pretoria.

ECONOMIC IMPORTANCE.

Apart from the above-mentioned toxic principles found in many genera of the Cucurbitaceae, which have in the past been extensively used in medicine and are still important in native medicine in many parts of the world and which have, at least in Southern Africa, caused occasional poisoning of cattle and humans, this family has provided some important economic plants. Forms producing edible fruits which are extensively grown throughout the world as vegetables or table fruits (*Cucumis*: cucumber, gurkins and melon; *Citrullus*: water-melon; *Lagenaria*: calabash gourds; *Cucurbita*: pumpkins, squashes or cantaloupes, vegetable marrow, etc.; *Sechium*, *Luffa*, *Trichosanthes*, *Momordica*).

Native tribes all over the world also eat fruits or sometimes the tuberous roots of wild species and in some cases, especially in Southern Africa, these products are a staple diet in certain seasons, such as the dried fruit pulp of *Acanthosicyos horrida* for the Hottentot tribes in the Namib area of South West Africa, or they form the main (and in the dry season sometimes the only) source of water for the Bushmen in the Kalahari, for example the wild form of *Citrullus lanatus* or "Tsamma" melon. Apart from these, the fruits and/or roots of species of *Cucumis*, *Coccinia* and *Corallocarpus* and the fruits of *Citrullus naudinianus* are part of the diet of many tribes. Recent ethnological explorations among the Bushmen in the Kalahari included studies of their diet and it goes without saying that a proper identification of the food plants is essential to prevent confusion. *Cucumis hookeri* for instance is eaten by Hottentots and Bushmen, but up to now nearly all herbarium specimens of this species were named "*Cucumis africanus*", "*C. dissectifolius*" or "*C. myriocarpus*". It is now apparent that *Cucumis zeyheri* and *C. myriocarpus* (= *C. dissectifolius*) do not occur in South West Africa or most of the Kalahari proper and these two species are invariably very bitter and extremely poisonous. An identification of the edible form of *C. hookeri* as *C. zeyheri* or *C. myriocarpus* would of course lead to most contradictory and confusing reports.

Finally, some species occur as weeds on cultivated lands, viz. (in the order of their frequency and importance), *Cucumis myriocarpus*, *C. melo* (wild form), *Citrullus lanatus* and *Cucumis zeyheri*, but as weeds they are not very troublesome and are easily controlled by cultivation (hoeing, etc.).

CUCURBITACEAE

Annual or perennial, mostly herbaceous climbing or creeping plants, occasionally woody, rarely erect or arborescent, almost invariably with tendrils and often scabrid on stems and/or leaves. *Rootstock* sometimes large, tuberous. *Leaves* alternate, simple and undivided to deeply palmately or more rarely pinnately dissected with entire or dissected segments, or sometimes palmately or pedately compound, usually petiolate, often cordate at the base, varying from small in some genera to large in others, very rarely reduced or wanting; petiole sometimes with a stipuliform bract in its axil or biglandular at its apex. *Tendrils* laterally at the same nodes as the leaves, simple, bifid or occasionally multifid, rarely reduced to straight spine-like organs or wanting. *Flowers* unisexual, monoecious or dioecious (in monoecious species often protandric), borne in the leaf-axils and, in monoecious species, male and female flowers in different axils (often the male ones in the upper axils, the female ones in the lower axils) or more rarely male and female flowers produced in the same axil; male flowers solitary or in fascicles, umbels, racemes or cymes; female shallow to cup-shaped or sometimes flowers usually solitary. *Male flowers*: Calyx and corolla united below to form a tubular receptacle; calyx-lobes 5, usually free; corolla-lobes free or united at the base, white, cream-coloured, greenish or yellow, rarely orange or red, often small and inconspicuous, but in some genera rather large but rarely showy; stamens often 3, rarely 5 or 2, occasionally 4 plus one staminode, inserted on the receptacle; filaments usually short, free or united; anthers free or cohering in a head, 1- or 2-theous

(often 1- and 2-thecous ones occur in one flower); connective often produced above the thecae, straight, curved, sigmoid or conduplicate; rudiment of ovary often present. *Female flowers*: Calyx and corolla as in the male flowers but occasionally different in size; staminodes usually present; ovary inferior, more rarely free at the apex, connate with the receptacle to form a globose to fusiform or tubular structure which is often separated from the rest of the flower by a constriction; ovary-chambers 3, more rarely 2 or 1 or (by spurious septa) 4-6; ovules usually several to many, rarely only 1-2; style terminal, simple or divided at the apex, sometimes surrounded at the base by a disc or cup-like structure; stigma various but usually with 2 or 3 fleshy lobes. *Fruit* a usually indehiscent, more rarely dehiscent, soft or hardshelled berry (pepo), which is fleshy inside, or occasionally fruit dry, leathery or corky. *Seeds* often numerous, often compressed, smooth or variously pitted, occasionally hairy, often margined, rarely with membranous wings; testa leathery, crustaceous or bony, tegmen membranous or hyaline; cotyledons conforming to the shape of the seed, thick or flattened; radicle usually short, conical; endosperm very scanty or 0.

Mainly circumtropical in distribution, rare in boreal climates. Of the about 100 genera, 16 are represented in Southern Africa.

The generic limits in this family, as first defined by D. J. Hooker in Benth. & Hook., Gen. Pl. 1 (1867) and amended by Cogniaux in his monograph 1881 have found general recognition and are without any essential changes used in botanical works, such as regional or local floras, all over the world. It is not to be expected that any drastic changes in the generic taxonomy of this family will take place, at least not in the near future. One may differ in minor points such as the delimitations of two or three closely related taxa, and in the present paper the only important changes in the circumscription of the genera are the reductions of *Hymenosicyos* to *Oreosyce*, of *Pisosperma* and *Toxanthera* to *Kedrostis*, of *Raphanistrocarpus* to *Raphanocarpus* and of *Sphaerosicyos* to *Lagenaria*. The reasons are given under the genera in question.

The definition of the various genera is based on characters taken from both the male and the female flowers and occasionally, in addition, from the fruits and seeds, more rarely from vegetative characters. The use of characters of both male and female flowers in one key (as is usually done) often makes it difficult to establish the genus if the specimen is dioecious or, if monoecious, is protandric and bears flowers of only the one sex. Fruiting specimens without flowers are even more difficult to place, as in many genera the fruit is of the same type.

It is tried here to avoid this difficulty by using a key with subdivisions, in each of which the vegetative characters, the morphology of the male flowers and of the female flowers and the structure of the fruits and seeds are exclusively used in this sequence, so that if special parts are lacking an alternative part of the key can be used.

In most cases types, isotypes or otherwise authenticated specimens of each species were available for study. The type specimens originally deposited in the Berlin Herbarium, such as several of the "older" Dinter specimens, were destroyed by fire, but fortunately in most cases isotypes were located in other herbaria.

KEY TO GENERA

- A rigid leafless shrub armed with spines; tendrils 0..... 10. **Acanthosicyos**
 Plant with well-developed leaves; tendrils present, very rarely reduced to spines or absent (occasionally flowers appearing on the bare stems before the leaves but, if so, stems without spines and tendrils well developed):
 Petioles biglandular at the apex (rarely glands absent in all leaves of the specimens)..... 13. **Lagenaria**

Petioles never glandular at the apex (sometimes sessile glands present on the leaf-blades):

Petioles (at least the majority) with a conspicuous, sessile, stipuliform, toothed or fimbriate leafy bract at the base:

Flowers monoecious, minute; fruit subglobose, about the size of a cherry or slightly smaller; seeds few, compressed, marginate:

Male and female flowers borne in different axils; style surrounded by a disc; plants usually drying a light greyish green (S.W. Africa, Angola)

2. **Dactyliandra**

Male and female flowers borne in the same axil; style without a disc; plant usually drying dark (Bechuanaland, Transvaal, tropical Africa)

3. **Blastania**

Flowers dioecious, not very small, with tubular receptacle; fruit usually ovoid and apiculate or at least somewhat pointed; seeds but slightly compressed, emarginate..... 14. **Trochomeria**

Petiole without conspicuous stipuliform bract at the base:

Flowers present..... A

Only fruits present..... AA

A

Receptacle with 3 incurved scales at the base of the petals (and often with a few additional smaller ones):

Flowers monoecious; ovary smooth, ovules few (often 2); fruit dry, narrowly fusiform, few-seeded; leaves simple..... 8. **Raphanocarpus**

Flowers monoecious or dioecious; ovary often muricate or with soft thick spines; fruit fleshy, not narrowly fusiform, many-seeded... 9. **Momordica**

Receptacle without incurved scales at the base (though sometimes in female flowers with minute staminodes):

Male flowers present (with or without female flowers)..... B

Only female flowers present..... BB

B

Anthers straight or more or less curved but not conduplicate or sigmoid:

Stamens 4, with a rudimentary fifth stamen, anthers small, usually horizontal..... 1. **Gerrardanthus**

Stamens 3-5, but if 5, all stamens fertile; anthers not horizontal:

Rudiment of pistil in male flowers none or small, gland-like:

Flowers monoecious or dioecious; fruit not circumscissile at the base..... 6. **Kedrostis**

Flowers always monoecious, the male and female ones usually borne in the same axils; fruit circumscissile at the base.... 7. **Corallocarpus**

Rudiment of pistil in male flowers evident:

Receptacle rather wide, campanulate to shortly and broadly tubular; anthers usually not linear, basi-fixed, almost invariably with distinct filaments; connective rather broad; flowers monoecious or dioecious; ovary in female flowers not setose..... 4. **Melothria**

Receptacle rather narrowly subcylindric; anthers linear, dorsifixed in the middle on very short filaments; connective narrow; flowers monoecious; ovary in female flowers setose..... 5. **Oreosyce**

Anthers conduplicate or sigmoid:

Receptacle short, rotate, campanulate, cup-shaped or shortly tubular, not much longer than wide:

Filaments connected at least at their apices to form a distinct tube; anthers cohering; plants dioecious, flowers rather large..... 16. **Coccinia**

Filaments free; anthers free or sometimes cohering:

Rudiment of pistil in male flower absent or minute; connective not produced above the anthers; tendrils usually bifid to multifid:

- Flowers racemose, rarely solitary, large, white, green-veined; tall perennial climber or occasionally prostrate (*L. mascarena*) 13. **Lagenaria**
- Flowers solitary or fascicled, not racemose, yellow; prostrate plants 11. **Citrullus**
- Rudiment of pistil in male flower evident; tendrils simple:
 Plants monoecious or dioecious; connective produced beyond the anthers; ovary and, as a rule, also the fruit often muricate or covered with soft spines or bristles, or densely hairy.... 12. **Cucumis**
- Plants dioecious; connective not produced beyond the anthers but with papillae or glands at the apex (*T. sagittata*)..... 14. **Trochomeria**
- Receptacle elongate, tubular, funnel-shaped or cylindrical, distinctly longer than wide:
 Corolla-lobes usually narrow, tapering into an acute apex; rudimentary pistil evident; connective at its apex with glands or papillae; dioecious perennials with tuberous root..... 14. **Trochomeria**
- Corolla-lobes broad, ovate or oblong to obovate; rudimentary pistil small, gland-like:
 Perennial; anthers cohering..... 15. **Peponium**
 Annual; anthers free (*L. siceraria*)..... 13. **Lagenaria**
- BB**
- Receptacle short, rotate, campanulate or shortly tubular, not much longer than wide:
 Style surrounded by a disc at the base:
 Ovary smooth (glabrous or hairy):
 Fruit smooth or somewhat foveolate, glabrous, usually small, globose or sometimes somewhat fusiform, rarely attaining 2.5 cm, seeds marginate..... 4. **Melothria**
- Fruit usually hairy, more than 2 cm (usually more than 3 cm) long, seeds not marginate..... 12. **Cucumis**
- Ovary muricate, or covered with soft thick spines; fruit with warts, muricate or with soft spines:
 Soft spines on ovary and fruit bearing several bristles and intermingled with setae; female flowers often with developed, dorsifixed, linear, sessile anthers; seeds marginate..... 5. **Oreosyce**
- Soft spines on ovary and spines or warts on fruit not covered or intermingled with bristles (sometimes ending in a bristle); only minute staminodes present; seeds emarginate..... 12. **Cucumis**
- Style not surrounded by a disc at the base:
 Flowers small or minute; corolla usually greenish-white or pale yellow:
 Fruit a red berry circumscissile at the base..... 7. **Corallocarpus**
- Fruit not as above:
 Tendrils simple (see also 14. *Trochomeria sagittata*)..... 6. **Kedrostis**
- Tendrils bifid:
 Ovary with 2 placentas and numerous horizontal ovules; fruit a berry with tumid unwinged seeds..... 6. **Kedrostis**
- Ovary 3-loculed with few pendulous ovules in each locule; fruit dry, dehiscent with 3 valves at the apex; seeds winged 1. **Gerrardanthus**
- Flowers larger; corolla yellow, buff, orange or white with green veins, rarely greenish-yellow:
 Ovary subglobose or, if ellipsoid, muricate; plants never climbing; corolla yellow or yellowish, if white with distinct green veins (see also 16. *Coccinia rehmannii*)..... 11. **Citrullus**
- Ovary ellipsoid, not muricate; corolla white with distinct green veins (*L. mascarena*)..... 13. **Lagenaria**

Ovary ovoid, narrowly ellipsoid to narrowly cylindrical or fusiform-linear, not muricate; corolla various but often yellow..... 16. **Coccinia**

Receptacle tubular, funnel-shaped or subcylindrical, distinctly longer than wide:

Leaves usually deeply dissected, rarely over 6 cm in diameter; petals often narrow, tapering towards the apex; ovary glabrous..... 14. **Trochomeria**

Leaves more or less lobed but usually not deeply dissected, often well over 6 cm in diameter; petals broad (see also 13. *Lagenaria siceraria*) 15. **Peponium**

AA

Fruit dry, linear-fusiform, few-seeded, ultimately dehiscent by longitudinal slits; seeds not winged..... 8. **Raphanocarpus**

Fruit dry, subtruncately 3-valved at the apex, seeds few, winged... 1. **Gerrardanthus**

Fruit fleshy though sometimes hard-shelled, dehiscent or indehiscent, seeds not winged:

Fruit muricate or with distinct protuberances or with soft spines:

Fruit ultimately dehiscent, often orange or scarlet; seeds much compressed, marginate, usually appearing as if corroded especially along the margin

9. **Momordica**

Fruit indehiscent, rarely orange or scarlet; seeds not appearing as if corroded:

Soft spines on fruit bearing several bristles and intermingled with setae; seeds marginate..... 5. **Oreosyce**

Soft spines or warts on fruit not setiferous on the sides and not intermingled with setae but sometimes terminating in a single soft bristle; seeds emarginate:

Fruit usually well over 5 cm long, ellipsoid, pale yellow or pale yellowish-green, covered with coarse blunt conical protuberances; tendrils rigid, straight, spinescent; leaves deeply palmatisect; plant prostrate (see also 12. *Cucumis ficifolius*)..... 11. **Citrullus**

Fruits not bearing warts, spines or other protuberances, but sometimes hairy:

Fruit circumscissile at the base, scarlet when ripe; seeds tumid 7. **Corallocarpus**

Fruit not circumscissile at the base:

Leaves twice trifoliolate (*M. clematidea*)..... 9. **Momordica**

Leaves not twice trifoliolate:

Outer layer of fruit soft, usually easily squashed or, if harder, either fruit under 2 cm in diam. or geocarpic, or ellipsoid-fusiform, rarely exceeding 10 cm in length; seeds ovate or elliptic to subglobose, not subrectangular and not notched on one or both ends:

Seeds distinctly compressed, often marginate:

Fruit small, globose or rarely somewhat fusiform, smooth or finely foveolate, glabrous, under 3 cm long; seeds marginate

4. **Melothria**

Fruit larger, rarely under 3 cm long, glabrous or hairy, never foveolate:

Fruit over 5 cm in diam., often much larger, not geocarpic, glabrous, never scarlet, globose (in cultivated specimens often very large, oblong, and seeds usually dark coloured)

11. **Citrullus**

Fruit not globose or, if so, seeds whitish or fruit geocarpic or fruit under 5 cm in diam.:

Seeds smooth, more or less regularly elliptic or ovate in outline (not triangular or produced on one side), white; fruit hairy or glabrous, but not scarlet when ripe (see also 14. *Trochomeria*)..... 12. **Cucumis**

- Seeds more or less triangular in outline, or ovate-oblong and produced on the one side, white or dark coloured; fruit scarlet and always quite glabrous when ripe:
- Tendrils usually simple; fruit when ripe easily squashed; seeds white or light coloured..... 16. **Coccinia**
- Tendrils bifid; fruit with a firm outer layer; seeds dark coloured when ripe..... 15. **Peponium**
- Seeds not much compressed, not marginate:
- Tendrils forked..... 6. **Kedrostis**
- Tendrils simple:
- Monoecious or dioecious; seeds usually subglobose 6. **Kedrostis**
- Dioecious; seeds usually ellipsoid or ovate in outline, somewhat compressed..... 14. **Trochomeria**
- Outer layer of the large fruit (over 6 cm in diam., never geocarpic) hard and almost bony (see also 11. *Citrullus*, which has almost invariably dark and rather regularly shaped ovate, elliptic or oblong seeds); seeds narrowly triangular, notched or emarginate on the one side, or subrectangular, truncate or bidentate at one or both ends..... 13. **Lagenaria**

1. GERRARDANTHUS

Gerrardanthus Harv. ex Benth. & Hook. f., Gen. Pl. 1: 840 (1867); Harv., Gen. S. Afr. Pl. ed. 2: 127 (1868); Cogn., Mon. Cucurb. 935 (1881); Pflanzenreich 275.1: 18 (1916); Baill., Hist. Pl. 8: 425 (1886); Pax in Pflanzenfam. 4, 5: 12 (1889); Phillips, Gen. ed. 2: 744 (1951). Type species: *G. macrorhizus* Harv. ex Benth. & Hook. f. *Atheranthera* Mast. apud Hook. f. in Fl. Trop. Afr. 2: 519 (1871).

Climbing shrubs; rootstock tuberous. *Stems* often long. *Leaves* petiolate, membranaceous, cordate or cordate-hastate, entire or more or less 3-5-lobed. *Tendrils* bifid near the apex. *Flowers* dioecious, small. *Male flowers* racemose or paniculate, sometimes appearing as if fasciated; receptacle small, rotate; sepals 5, small; corolla rotate or widely campanulate, deeply 5-partite with oblong or linear segments, of which two are slightly larger than the other 3; stamens 4; filaments remote, short, incurved; anthers small, often horizontal in the flower, 1-theous, all or in pairs cohering, connective sometimes with a dorsal (in the flower erect) subulate spur; staminode filiform or subulate; no rudimentary pistil present. *Female flowers* solitary or racemose; receptacle and perianth as in the male; staminodes often absent; ovary elongate, trigonous, imperfectly 3-locular with 2 or few pendulous ovules per locule; styles 3, short, patent, subtrigonous and stigmas truncate-bilobed, or style 1, short, thick and conical with a sessile reniform stigma. *Fruit* elongate, terete-obconical, dry, coriaceous, broadly truncate and 3-valved at the apex, few-seeded. *Seeds* oblong, compressed, with a large elliptic or oblong wing at the apex; testa crustaceous, finely granulate; cotyledons oblong, straight; radicle short, straight, conical.

Found in tropical Africa, extending into Angola and through Natal to the eastern Cape Province. Two species in South Africa.

Leaves glabrous; connective without a spur-shaped appendix; styles 3..... 1. *G. macrorhizus*
 Leaves tomentose on lower surface; connective produced into a spur-like appendix; style 1,
 short, conical..... 2. *G. tomentosus*

1. *G. macrorhizus* Harv. ex Benth. & Hook. f., Gen. Pl. 1: 840 (1867); Cogn., Mon. Cucurb. 935 (1881); Pflanzenreich 275.1: 19 (1916).
G. megarhiza Decne. & Harv. in Harv., Gen. S. Afr. Pl. ed. 2: 127 (1868).

Type: The original description is the same as the generic description in *Genera Plantarum*, but no specimens are cited. Harvey mentions under *G. megarhiza* no actual specimen, but he states that he received material from W. T. Gerrard, in whose honour he named the genus. By inference one might select Gerrard's specimens in Trinity College, Dublin, as the type material, but it may be possible to establish which specimens D. J. Hooker has annotated at Kew when drawing up a description, either from herbarium records or from his correspondence.

Tuber flattened, bitter 30–60 cm long and up to 1.50 m in diam. *Stems* woody, high-climbing; ultimate portions slender, angular and strongly sulcate when dry. *Leaves* glabrous, drying membranous, broadly ovate-cordate, subtriangular-hastate or pentagonal in outline, more or less angular to 3–7-lobed, 3–8 cm long and wide, shallowly and broadly cordate, rarely more deeply so at the base; the margin entire; the lobes unequal with the terminal one the longest, usually triangular and rounded to subacute, mucronate; the terminal one often more acute and with a longer mucro; petioles slender, smooth or somewhat sulcate, glabrous, 1.5–4 cm long. *Tendrils* elongate, slender, glabrous. *Male flowers*: common peduncle often very short or wanting and flowers as if fascicled; pedicels very slender, 0.5–3 cm long; sepals oblong, obtuse, 3 mm long, corolla rotate, glabrous, brownish, about 12 mm in diam, segments at the apex often somewhat emarginate; filaments filiform, about 1.5 mm long; anthers horizontal, without spur-like appendage. *Female flowers* solitary; peduncle filiform, 1–2 cm long, minutely bracteate at the base; ovary narrowly obconical, 1.5 cm long, 2–2.5 mm thick; styles 3, about 2 mm long. *Fruit* obconical-subcylindric, narrowed at the base, drying brownish-yellow, glabrous and smooth, faintly angular and with obscure longitudinal ribs, 5–6.5 cm long and 15–22 mm in diam. *Seeds* bright brown, compressed, linear-oblong, often somewhat oblique with one nearly straight and one curved lateral side, narrowed and subtruncate at one or both ends, 16–25 mm long and 4–7 mm wide; wing oblong to elliptic, pellucid, pale brown, 2–3 cm long and 7–14 mm wide.

Found in eastern Cape Province through Natal to tropical East Africa, in lowland forests.

CAPE PROVINCE.—East London: Nahoon Island, *J. Wood* in Herb. Galpin 6269 (GRA, L, PRE); Galpin 8215 (PRE). Komgha: *Flanagan* 702 (BOL, GRA, PRE, SAM); *Schlechter* 6217 (GRA); Kei Bridge, *Galpin* 7776 (PRE, GRA). Kentani: *Pegler* 1213 (BOL). Mqanduli: *Pegler* 628 (PRE).

NATAL.—Umzinto: Mtavalumine (Umtwalumi), *Rudatis* 2074 (NH). Pinetown: Marianhill, *Forbes* 1028 (NH). Nongoma: Mkuzi, *Gerstner* in NH 22803 (NH). Zululand, "Umhlatuzi Valley near Falls", *Wood* 2179 (NH, SAM).

SWAZILAND.—Lebombo Mts., *Keith* s.n. (PRE).

PORTUGUESE EAST AFRICA.—Sul do Save: Lebombo Range, Goba, *Esteves de Souza* 114 (PRE).

Although the original specimens collected by Gerrard were not studied, the identification of the specimens is certain because specimens were compared at Kew and the gathering *Schlechter* 6217, cited by Cogniaux in his monograph, was available.

2. *G. tomentosus* Hook. f. in Curtis, Bot. Mag. t.6694 (1883); Cogn. in Pflanzenreich 275.1: 20 (1916). Type: Natal, Inanda, *Wood* 451 (K, holo.; NH, iso.!).

Branches somewhat robust, sulcate, greyish, when young shortly and densely tomentose, when older glabrescent. *Leaves*: petioles robust, shortly and densely tomentose, 3–5 cm long; lamina membranous, reniform-suborbiculate, slightly 5–7 lobed or almost to the middle, deep green, shortly and sparsely hairy above, greyish-green, more or less densely tomentose, 6–12 cm long and broad; lobes ovate or triangular, somewhat acute, entire or slightly undulate; basal sinus narrowly rectangular, 2–2.5 cm deep. *Tendrils* rather robust, very long, rather densely and shortly puberulous.

Flowers dioecious; male flowering branches slender, 10 cm long; flowers fasciculate at the nodes, fascicles bracteate; pedicels very slender, spreading, 3–12 mm long; bracts foliaceous, shortly petiolate, triangular-lanceolate, acuminate, 1 cm long; buds scarcely 2 mm thick; corolla 12–18 mm in diam., its segments ovate-oblong, obtuse, the margin broadly reflexed; filaments rather short; anthers elliptic-ovoid, connective produced into an elongate spur; *female flowers* solitary or in short 3–4 flowered racemes; sepals broadly triangular, obtuse, 2 mm long; staminodes setaceous; ovary tubulose-campanulate, 10-nerved, very shortly puberulous, 1.5–2 cm long; style single, very short, thick, conical; stigma sessile, reniform. *Fruit* narrowly campanulate, 10-nerved, smooth, the apex obtuse, trivalved, 6–7 cm long. *Seeds* pale fulvous, slightly marginate, 20–25 mm long, 5–6 mm broad; wing pellucid, its base shortly decurrent, obovate-oblong, 3 cm long, 17–18 mm broad, its apex rotund.

Recorded only from Natal.

NATAL.—Durban: near Durban, *McClellan* s.n. (PRE). Inanda: *Wood* 451 (NH).

This apparently very rare species has, as far as can be ascertained, been collected only once since *Wood* collected the type specimen nearly 80 years ago, viz. by *McClellan* in 1941.

2. DACTYLIANDRA

Dactyliandra *Hook. f.* in *Fl. Trop. Afr.* 2: 557 (1871); *Cogn.*, *Mon. Cucurb.* 626 (1881); *Pflanzenreich* 275.1: 129 (1916); *Pax in Pflanzenfam.* 4, 5: 15 (1889); *Phillips*, *Gen. ed.* 2: 745 (1951). Type species: *D. welwitschii* *Hook. f.*

Slender annual herb, scandent or prostrate. *Leaves* once or twice tripartite or palmately 5–7-lobed; petiole with a stipuliform bract-like organ at the base. *Tendrils* simple. *Flowers* minute, monoecious. *Male flowers* not in the same axils as the female ones, in a pedunculate few- to 12-flowered subumbellate raceme; receptacle campanulate with a ring of hairs with globose tips in the throat; sepals subulate or triangular; corolla lobes oblong or oblong-elliptic, rounded or obtuse at their tips, outside glandular-papillose or pubescent; stamens 3 inserted on the receptacle near the base; filaments short, free; anthers ovate, cohering, two 2-theous and the third 1-theous; thecae linear, but bent like a horse-shoe; connective not produced beyond the anthers; rudiment of ovary represented by a depressed gland. *Female flowers* solitary or occasionally in pairs, calyx and corolla as in the male; staminodes 0; ovarium oblong to subglobose, attenuate at the apex; placentas 3; ovules numerous; style columnar, inserted in a disc; stigma subcapitate, 3-lobed. *Fruit* a small, globose indehiscent berry, red when ripe, usually few-seeded. *Seed* irregularly oblong in outline, dilated about the middle and truncate at the ends, slightly compressed with 2 flattish surfaces and a distinct margin; testa very thick.

A monotypic genus found in Angola and South West Africa. *Cogniaux* (1916) recognised two species, but the second is indistinguishable from the type species.

D. welwitschii *Hook. f.* in *Fl. Trop. Afr.* 2: 557 (1871); *Cogn.*, 11.cc. (1881); (1916); *Hiern*, *Cat. Welw. Afr. Pl.* 1, 2: 403 (1898). Type: from Angola.

Blastania luederitziana *Cogn.* apud *Schinz* in *Abh. Bot. Ver. Brandenb.* 30: 152 (1888); *Dinter* in *Fedde, Repert.* 15: 349 (1917–1919).

Dactyliandra luederitziana (*Cogn.*) *Cogn.* in *Pflanzenreich* 131 (1916).

Stems up to about 1 m long, usually slender and much branched, sulcate and with short white bent thick bulbous-based hairs on the ribs ultimately turning scabrid. *Leaves* digitately 5–7-lobed nearly to the base, on both sides shortly setulose-scabrid, ultimately finely white-punctate and usually very scabrous, 3–8 (–12) cm long and wide; the segments oblong to obovate or lanceolate, acute to obtuse, mucronate, much

narrowed towards the base, irregularly and coarsely dentate to pinnatilobed, the middle one the longest, the lateral ones gradually smaller, lowermost often with a lateral lobule or bilobed; petioles slender, scabrid-setose, 2–5 cm long. *Stipuliform bract* sessile, suborbicular-reniform to ovate, sometimes slightly 2-lobed or asymmetrical, shortly setose, later white punctate and scabrid, long ciliate-dentate along the margin, 5–15 mm long and 3–13 mm wide. *Male flowers*: common peduncle slender, often filiform, sparsely asperulous, 2–5 cm long; pedicels erectopate, filiform, scabridulous or shortly setulose, up to 15 mm long, at the base with minute, subulate, early deciduous bracts; receptacle shortly hirsute, 1.5–2.5 mm long and wide; sepals patent to recurved, 0.5–1.5 mm long; corolla whitish or yellowish papillose-pubescent, 1.5–3 mm long. *Female flower*: pedicel short; ovary shortly papillose-puberulous, 2–3 mm in diam. *Fruit* ultimately glabrous, smooth, about 15 mm in diam.; pedicel up to 2 cm long. *Seeds* 5–7 mm long, 3.5–4 mm wide and about 1.5 mm thick.

Type: In the original description Hooker cites: "Sandy thickets in Loanda, Dr. Welwitsch". According to Hiern and Cogniaux there is only one Welwitsch number (No. 833) collected in Loanda and this is apparently the type gathering (Welwitsch also collected this species in Mossamedes, No. 832). The actual type specimen is apparently in BM.

ANGOLA.—Loanda: *Welwitsch* 833 (COI, iso.); Muceque de Calemba, *Gossweiler* "10" (leg. Sept. 1935, COI). Benguela: *Menyhart* 218 (Z). Mossamedes: *Exell & Mendonça* 2152 (COI); Rio Mucungo, *Carisso & Sousa* 318 (COI); Sierra de Lua, *Gossweiler* 10694 (COI).

SOUTH WEST AFRICA.—Kaokoveld: Kunene banks, *Story* 5795 (PRE); near Sanitatas, *Story* 5683 (PRE); Oruwanjai, *de Winter & Leistner* 5645 (PRE). Ovamboland: Oshando, *Schinz* 317 (Z). Grootfontein: Tsumeb, *Watt* s.n. (PRE); Namutoni, *Breyer* in TM 20658 (PRE). Outjo: Pamela, *Volk* 2891 (NH); between Franzfontein and Brandberg, *de Winter* 3121 (PRE). Omaruru: Brandberg, *Liebenberg* 5011 (PRE); *Merxmüller & Giess* 1577 (M, PRE). Okahandja: *Dinter* 12 (COI, GRA, L, SAM); 76 (SAM). Swakopmund: *Bradfield* 586 (PRE). Karibib: *Kinges* 3449 (PRE). Rehoboth: between Rehoboth and Uhlenhorst, *Wilman* 459 (BOL, PRE); between Kalkrand and Rehoboth, *de Winter* 3537 (PRE); *Acocks* 18160 (PRE); Naukluft Mts., Buellspport, *Strey* 2146; 2178; 2336 (PRE). Gibeon: Packriem, *Range* 1350 (SAM). Lüderitz: Otjisewa, *Kinges* 2484 (PRE).

Although the original specimens cited by Cogniaux 1888 under *Blastania luederitziana* were not seen, some specimens cited by Cogniaux in his 1916 monograph (*Dinter* 12, *Schinz* 317) leave no doubt about its identity. These specimens are indistinguishable from the type specimen of *Dactyliandra welwitschii* (the "differences" mentioned by Cogniaux in his 1916 monograph do not hold). A characteristic of all specimens, both from Angola and from South West Africa, is that they dry to a rather light, somewhat greyish green.

3. BLASTANIA

Blastania Kotschy & Peyr., Pl. Tinn. 15, t.7 (1865–66); edit. Kanitz 21 (1868); Cogn., Mon. Cucurb. 627 (1881); Pflanzenreich 275.1: 133 (1916); Pax in Pflanzenfam. 4, 5: 16 (1889); Phillips, Gen. ed. 2: 745 (1951). Type species: *B. garcinii* (L.) Cogn. (fide Phillips).

Ctenopsis sensu Hook. f. ex Naud. in Ann. Sci. Nat. 5me ser. 6: 12 (1867), non De Notar. (1847).

Ctenolepis Hook. f. in Benth. & Hook. f. Gen. Pl. 1: 832 (1867); Fl. Trop. Afr. 2: 557 (1871); Clarke in Hook. f., Fl. Brit. Ind. 2: 629 (1879).

Annual scabrid, prostrate or scandent herbs, often drying dark. *Leaves* orbicular in outline, deeply digitately 3–5-lobed or -partite with a large stipuliform, orbicular or oblong to subreniform, toothed or ciliate bract at the base of the slender petiole. *Flowers* monoecious. *Male flowers* racemose; receptacle short, campanulate; sepals small, subulate; corolla rotate, deeply 5-partite; stamens 3, inserted on the receptacle free; filaments very short; anthers small, one 1-theous, two 2-theous; thecae straight; connective not apically produced; rudimentary pistil wanting. *Female flowers* solitary in the same axils as the male raceme, shortly pedicelled; receptacle, calyx and corolla as in the male; staminodes 0; ovary ovoid to subglobose with few horizontal ovules on 2–3 placentas; disc absent; style columnar; stigmas 2, rarely 3. *Fruit* small, fleshy, globose, sometimes more or less oblique, 2- or few-seeded, indehiscent. *Seeds* ovoid, much compressed, concave or boat-shaped above, convex beneath, smooth, with an acute margin.

Species 2, the type species in India and Ceylon, the second widespread in tropical Africa, India and Ceylon.

B. cerasiformis (*Stocks*) *A. Meeuse*, comb. nov.

Zehneria cerasiformis Stocks in Hook. Journ. Bot. Kew Gard. Misc. 4: 149 (1852). Lectotype: A syntype of both *Zehneria cerasiformis* and *Blastania fimbristipula* is Kotschy 205 and this is selected here as the lectotype.

Bryonia fimbristipula Fenzl in Flora 19: 312 (1844), nomen tantum.

Blastania fimbristipula Fenzl ex Kotschy & Peyr., Pl. Tinn. 15, t.7 (1865–66); Cogn., 11.cc. (1881); (1916); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 178 (1927).

Ctenopsis cerasiformis (Stocks) Naud. l.c. 13 (1867).

Ctenolepis cerasiformis (Stocks) Hook. f. in Fl. Trop. Afr. 2: 558 (1871); C. B. Clarke, l.c. 629 (1879); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 181 (1950); Keay, Fl. W. Trop. Afr. ed. 2, 1, 1: 208 (1954).

Stems usually slender, elongate, usually branched, angular-sulcate or striate, glabrous or shortly and sparsely hispid, ultimately often slightly scabrid, occasionally white-punctate and scabrid, often geniculate at the nodes; internodes sometimes up to 12 cm long. *Leaves* palmately 3- or 5-partite, membranous, 2.5–10 cm long and wide, the segments ovate-oblong or obovate to elliptic or lanceolate, narrowed at both ends, acute or subobtuse, mucronate, remotely and often coarsely serrate-dentate, on both surfaces shortly scabrid-setose, ultimately white-punctate and scabrid; the central one with longer mucro, entire or 3-lobed; lateral ones smaller; basal ones often more or less deeply 2-lobed; petioles somewhat dorso-ventrally flattened and longitudinally striate-sulcate, densely shortly setose-hispid, ultimately white-punctate and scabrous, 1–5 cm long. *Stipuliform bracts* ovate, oblong, subreniform to suborbicular, subsessile or narrowed and subpetioled at the base, shortly setose-scabrid or scabrid on the abaxial side, long-ciliate, 4–20 mm long and 3–15 mm wide. *Male flowers*: common peduncle filiform, glabrous or puberulous, 0.5–3 cm long, subcapitately 3–10-flowered; pedicels 1–3 mm long; receptacle 0.5–1 mm long and about 1 mm wide; sepals about 0.5 mm long; corolla whitish or yellowish, its segments 0.8–1 mm long. *Female flowers*: pedicel short, in fruit up to about 5 mm long; ovary in anthesis about 2 mm in diam., glabrous or nearly so. *Fruit* smooth, glabrous, 10–15 mm in diam. *Seeds* often flat or slightly concave on the one side and convex on the other side, smooth, attenuated to acute at the base, 7–9 mm long, 4–6 mm wide and about 1.5 mm thick.

BECHUANALAND.—Between Kachikau and Kasane, nr. Chobe River: *Erens* 394 in Hb. Pole-Evans 4195 (PRE, SRGH). N'gamiland: *Curson* 71 (PRE).

TRANSVAAL.—Kruger National Park: Pilgrims Rest district, near Satara, *v.d. Schijff* 2224 (PRE); Nelspruit district, between lower Sabie and Skukuza, *v.d. Schijff* 1772 (PRE).

The following specimens often quoted in regional floras and monographs were also studied:

PORTUGUESE EAST AFRICA.—Boruma: *Menyhart* 645a (Z).

SOUDAN.—Cordofan: Arasch-Cool, *Kotschy* 205 (L, M, syntype gathering of *Blastania fimbristipula* and *Zehneria cerasiformis*); Sennaar, *Kotschy* 331 (L); Togodile, *Ehrenberg* 188 (L).

SENEGAMBIA.—Dagana: *Leprieur* (BR, L).

ARABIA.—Yemen: Badjil, *Schweinfurth* 557 (BR).

4. MELOTHRIA

Melothria L., Sp. Pl. ed., 1: 35 (1753); Ser. in DC., Prodr. 3: 313 (1828); Benth. & Hook. f., Gen. Pl. 1: 830 (1867); Hook. f. in Fl. Trop. Afr. 2: 562 (1871); Cogn., Mon. Cucurb. 572 (1881) and in Pflanzenreich 275.1: 75 (1916); Baill., Hist. Pl. 8: 446 (1886); Pax in Pflanzenfam. 4, 5: 15 (1889); Phillips, Gen. ed. 2: 745 (1951). *Zehneria* Endl., Prodr. Fl. Norf. 69 (1833); Gen. 936 (1840); Sond. in Fl. Cap. 2: 485 (1862); Benth. & Hook. f., l.c.; Hook. f., op. cit. 558 (1871).

Pilogyne Schrad., Ind. Sem. Hort. Goett. (1835), nomen; ex Eckl. & Zeyh., Enum. Pl. Afr. Austr. 277 (1834); Naud. in Ann. Sci. Nat. 5me. sér. 5: 36 (1866).

Mukia Arn. in Hook., Journ. Bot. 3: 271 (1841); Naud. in Ann. Sci. Nat. 4me. sér. 12: 141 (1859); Benth. & Hook. f., op. cit., 829; Hook. f., op. cit. 561.

Perennial or sometimes annual, climbing or prostrate often forming annual herbaceous stems from a perennial rootstock. *Stems* usually slender. *Leaves* entire to more or less distinctly palmately lobed, often thin in texture. *Tendrils* simple (very rarely bifid, not in S. Afr.). *Flowers* monoecious or dioecious, minute or small, male flowers corymbose, racemose or subumbellate in few- to many-flowered inflorescences, less often fasciculate or solitary, in monoecious plants usually not in the same axils as the female flowers; receptacle campanulate; sepals dentiform, often minute; corolla white to yellow or greenish deeply 5-partite; stamens usually 3; filaments inserted on the receptacle, free, sometimes with a ring or zone of hairs; anthers free or occasionally slightly cohering, two 2-theous and the third 1-theous (if stamens 2 both 2-theous, if stamens 4 only 1, 2-theous, if stamens 5 all 1-theous); thecae straight or rarely curved; connective rarely produced beyond the anthers, often papillose; rudiment of pistil globose or annular, rarely 3-lobed; *female flowers* solitary, fascicled or subumbellately racemose or corymbose; receptacle and perianth as in the male; staminodes 3, rarely bearing remains of anthers or wanting; ovary globose or ovoid or sometimes fusiform, with 3 placentas few- to many-ovuled constricted under the receptacle; style short, at the base surrounded by an annular disc; stigmas 3, linear, very rarely 2, or one 3-lobed stigma. *Fruit* an indehiscent usually small berry, globose, ovoid, ellipsoid to fusiform, few- to many-seeded. *Seeds* ovate or suborbicular in outline, much compressed or rarely thick, often marginate, smooth or occasionally pitted or rugose.

Type species: Melothria pendula L. (being the only species in this genus at its inception).

About 100 described species, circumtropic, with some species extending into more temperate zones. This genus, the largest of the Cucurbitaceae, has been divided by Cogniaux into three subgenera: *Eumelothria* which should now be called *Melothria*, *Solena* and *Mukia*. The limits between these subgenera are not very sharply defined, in fact in his latest monographic treatment of the family, Cogniaux sometimes treated one species under two different names and in two different subgenera (see under *M. marlothii*).

Flowers monoecious:

Flowers sessile, clustered; plant roughly hirsute-setose, leaves long triangular-cordate, seeds areolate..... 1. *M. maderaspatana*

Flowers usually distinctly pedicellate; pubescence and leaf-shape not as above; seeds smooth: Glabrous in nearly all its parts..... 2. *M. marlothii*

More or less densely pubescent..... 3. *M. cinerea*

Flowers normally dioecious:

Vegetative parts and calyx quite glabrous..... 4. *M. parvifolia*

Vegetative parts and calyx more or less hairy (sometimes pubescence scanty, but at least on main veins of lower leaf-surface)..... 5. *M. cordata*

***M. maderaspatana* (L.) Cogn.**, Mon. Cucurb. 623 (1881) and Pflanzenreich 275.1: 126 (1916); Pax in Engl., Pflzw. O.-Afr. C: 396 (1895); Hiern, Cat. Welw. Afr. Pl. 1 (2): 403 (1898); Burt Davy, Fl. Transv. 1: 225 (1926); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 179 (1931); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 181 (1950). Type: from India.

Cucumis maderaspatensis L., Sp. Pl. ed. 1: 1012 (1753); Willd., Sp. Pl. 4: 615 (1805). *Bryonia scabrella* Linn. f., Suppl. Pl. 424 (1781); Willd., op. cit., p. 619; Ser. in DC., Prodr. 3: 306 (1828).

Mukia scabrella (Linn. f.) Arn. in Hook. Journ. Bot. 3: 276 (1841); Naud. in Ann. Sci. Nat. 4me ser. 12: 142 (1859); Sond. in Fl. Cap. 2: 489 (1862); Hook. f. in Fl. Trop. Afr. 2: 561 (1871).

Bryonia micropoda E. Mey. ex Drège, Zw. Pflzgeog. Doc. 158 (1843), nomen tantum.

Annual. *Stems* several, prostrate or climbing, usually much branched, up to about 1 m long, the younger portions slender, sulcate, hispid to subaculeate with short usually curved whitish bulbous-based stiff hairs, older ones much stouter, glabrescent. *Leaves* thinly herbaceous to firm, ovate-hastate to oblong-hastate or narrowly triangular, undivided to 3- or occasionally 5-lobed; 3-15 cm long and 2.5-13 cm wide, the apex subacute to acute or shortly acuminate, minutely mucronate; the basal sinus usually wide and shallow, sometimes almost imperceptible, the margin very minutely denticulate or almost entire to distinctly crenulate-dentate; upper surface setose-scabrid becoming punctate-scabrid and very rough, somewhat setose on the midrib; lower surface shortly hispid-setose turning scabrid-punctate, the veins remaining hispidulous; primary and secondary nerves not conspicuous above (except the midrib), prominent below forming a coarse conspicuous reticulum; petioles shortly setose-hispid or aculeate-hispid, sometimes densely so, 0.75-8 cm long. *Tendrils* sparsely aculeate-hispid like stems and petioles, finely sulcate at least in lowermost portion. *Flowers* monoecious, fascicled or the females occasionally solitary, sessile or shortly pedicelled. *Male flowers*: receptacle long pilose-hirsute, about 2 mm long; sepals erect, 1-1.5 mm long; corolla yellowish, pilose-hirsute outside, about 2 mm long; connective of stamens produced into a usually bifid apical portion. *Female flowers*: ovary subglobose, covered with usually blackish setae. *Fruit* globose, ultimately glabrous and red when ripe, juicy. *Seeds* white, elliptic, elliptic-oblong or ovate-oblong, rather thick, verrucose or scrobiculate, distinctly margined (the margin usually with finely raised central portion), about 4 × 2.5 × 1.5 mm.

Type: There is no specimen in the Linnaean Herbarium which is labelled "*Cucumis maderaspatensis*". Accordingly, the figure cited by Linnaeus in Pluk., Almag. t.170, f.2 (1696) must be taken to represent the type.

Found throughout tropical Africa to Angola, Transvaal and Natal and northwards to Senegal and Egypt. Also from India to China, Formosa, Philippines, Malesia and Australia.

Recorded from the following districts: *Transvaal*: Soutpansberg, Pietersburg, Tzaneen, Nelspruit, Barberton; *Natal*: Mtunzini, Lower Tugela, Inanda, Durban, Pinetown, Polela.

The following specimens are of special interest: *Junod* 2622, from Shilovane, Tzaneen, Transvaal, in Z, erroneously cited by Cogniaux in *Pflanzenreich* 275.1: 68 (1916) as *Oreosyce triangularis* Cogn. (see under *Oreosyce*); *Schlechter* 11845, from Komatipoort, Barberton, Transvaal, in BOL, COI, GRA, PRE, cited by Cogniaux (1916) and by Burt Davy; *Drege* s.n., sub. nom. *Bryonia micropoda* E. Mey., from Durban, Natal, in L, cited by Sonder in *Flora Capensis* and by Cogniaux; *Wood* 956, from Polela district, Natal, in GRA, cited by Cogniaux (1916).

2. ***M. marlothii*** Cogn. in *Abh. Bot. Ver. Brandenb.* 30: 152 (29th Sept. 1888); in *Engl. Bot. Jahrb.* 10: 270 (9th Oct. 1888); and in *Pflanzenreich* 275.1: 100 (1916); Dinter in *Fedde, Repert.* 19: 188 (1923/24). Type: see below.
M. acutifolia Cogn. in *Bull. Herb. Boiss.* 3: 419 (1895) and in *Pflanzenreich* 275.1: 105 (1916); Burt Davy, *Fl. Transv.* 1: 225 (1926).

Annual. *Stems* climbing, slender, sometimes filiform, sulcate, glabrous or nearly so, often much branched, up to several meters long. *Leaves* thinly herbaceous drying membranaceous, ovate or narrowly deltoid-cordate to 5-angled, entire, angular or tricuspidate to shallowly 5-lobed, attenuate to acute or acuminate and terminating in a mucro at the apex, with a usually rather large, rounded semi-orbicular or subquadrate to rectangular shallow to fairly deep basal sinus and a remotely and minutely callous-dentate to subentire margin, 2-8 cm long and 1.5-6.5 cm wide, glabrous to finely and minutely setose-scabrid or punctate on both surfaces, but more distinctly so on upper surface, lower one sometimes smooth; main nerves slender, secondary and finer nervation inconspicuous; petioles slender, glabrous, 0.5-4 cm long. *Tendrils* filiform to capillary, glabrous. *Flowers* monoecious, minute, greenish yellow, or whitish, the male and female flowers usually produced in the same axils. *Male flowers* subumbellately racemose but raceme often contracted so that they appear fascicled, 3-10 (-16) flowered; common peduncle usually under 1 cm long but occasionally reaching 3 cm, capillary, glabrous; pedicels very slender, 1-5 mm long; flowers 1.5-2 mm long and as wide; receptacle hemispherical; sepals very minute, subulate, corolla glabrous. *Female flowers* solitary or binate; pedicels very slender, in fruit up to about 8 mm long; ovary spherical, glabrous. *Fruit* spherical, a dirty greenish red when ripe, finely reticulate, 6-9 mm in diam. *Seeds* white, much compressed, ovate in outline, not or obscurely marginate, 3.8-4.5 mm long and 2.8-3.3 mm wide.

Type: Cogniaux cited *Marloth* 957 and a specimen collected by *Schinz* No. 320, from Amboland in the original description. The original type specimen in Berlin was destroyed. A specimen in PRE labelled "*Melothria marlothii*" Cogn. from Barkly-West, Victoria Farm, Jan. 1886 (*Marloth* No. 957) is *Coccinia rehmannii* Cogn. There is another specimen in PRE labelled "*Melothria*, Queipütz, Bechuanaland, May 1886", numbered *Marloth* 1381, which is undoubtedly *Melothria marlothii* Cogn. I could not find No. 1381 cited anywhere (not in Engler's "*Plantae Marlothianae*" in *Engl. Bot. Jahrb.* 10, nor in Cogniaux's publications in *Schinz's* "*Beiträge zur Flora von Africa*" published in several journals, or in Cogniaux's *Cucurbitaceae* monographs). As *Coccinia rehmannii* was described only as late as 1895 and the specimen in PRE numbered *Marloth* 957 bears fruit only and no flowers, so that it was not adequate for description and may have remained unnamed in the Berlin herbarium (which point unfortunately cannot be established any more), whereas *Melothria marlothii* was recognised as an undescribed species in 1888 and, in any case, all unnamed specimens of this genus in the Berlin herbarium must have been studied by Cogniaux for his 1916 monograph in "*Das Pflanzenreich*", it would seem that there has never been a *Melothria* in the Berlin Herbarium with the number 1381 but possibly a *Coccinia* and, consequently, that the labels in *Marloth's* own herbarium were interchanged. However, there is not sufficient evidence that the specimen labelled "1381" in PRE can be taken to represent an isotype. The original holotype in B was destroyed.

The description of *M. marlothii* and all other specimens cited by Cogniaux leave no doubt that the original type specimen (*Marloth* 957 in B) was a *Melothria* and not a *Coccinia*. The identity of *M. marlothii* is not in doubt either, because the *Schinz* specimen from Oshiheke, Amboland in Z is still extant. This specimen is designated here as the lecto-type.

South West Africa to Transvaal, extends through Bechuanaland northwards to Northern Rhodesia.

SOUTH WEST AFRICA.—Kaokoveld: Koako Otavi, *de Winter & Leistner* 5578; Ohopoho, *de Winter & Leistner* 5332 (K, M, PRE). Ovamboland: Oshiheke, *Schinz* 320 (Z). Okavango: Nyangana, *de Winter & Marais* 4881 (PRE), Runtu, *de Winter & Marais* 4492 (PRE). Grootfontein: Otavifontein, *Dinter* 5413 (B); on road to Abenab, *Schoenfelder* S 569 (PRE); farm Kumkauas, *Kinges* 2911 (PRE); Gautscha Pan, *Story* 6237 (PRE); Otjiwarongo: Waterberg, *Rodin* 2584 (BOL); Okanjande, *Range* s.n. (BOL). Karibib: Erongo, *Pearson* 9841 (BOL). Okahandja: *Bradfield* 224 (PRE); *de Winter* 2704 (PRE). Windhoek: Otjiesewa, *Wiss & Kinges* 784 (PRE). Rehoboth: Naukloof Mts., farm Buellspport, *Strey* 2179 (PRE, NBG). Locality unknown: "Okakarara", *Liebenberg* 4693 (PRE).

BECHUANALAND.—Ngamiland: Mabele a Pudi, *Van Son* in T.M. 28796 (PRE); Linyanti River plains, *Mrs. Moss* in herb. Moss No. 18566 (J); Chukudu Pan, *Story* 4940 (PRE).

CAPE PROVINCE.—Barkly West: Victoria Farm, *Marloth* 957 (type originally in B, no isotypes seen); locality not known but most probably near Kuruman; Queipütz, *Marloth* 1381 (PRE, see under "Type specimen").

TRANSVAAL.—Brits: Hartebeespoort, *Mogg* s.n., *Repton* 586. Pretoria: near Pienaars River, *Meeuse* 9542; Roodeplaat Exp. Stn., *Leendertz* in T.M. 8639, *Rehm* s.n. (all PRE). Pretoria or Bronkhorstspuit district: "Neu Halle", Elandsrivier, *Rehmann* 4904 (syntype of *M. acutifolia* Cogn., Z). Waterberg: near Ellisras, *Meeuse* 10541 (PRE), Ons Hoop, *Codd* 8468a (PRE).

SOUTHERN RHODESIA.—Victoria Falls, *Rogers* 13192 (GRA).

NORTHERN RHODESIA.—Livingstone, *Rogers* 7140 (BOL); Mambova, *Munro* ML17 (PRE).

Cogniaux (1916) placed *M. acutifolia* in the section *Solena* (Lour.) Cogn., characterised by almost invariably dioecious flowers and usually marginate seeds. However, *M. acutifolia* has monoecious flowers and immarginate or obscurely marginate seeds. When using Cogniaux's key one would not hesitate to look for this species among the species of the section *Melothria* (= *Eumelothria* Cogn.) which has monoecious flowers and often immarginate seeds and to which Cogniaux correctly referred *M. marlothii*. The original descriptions of the two species, repeated by Cogniaux in his 1916 monograph, are also identical for practical purposes, the only difference being "*Flores . . . fasciculati*" in *M. marlothii* against "*Flores masculi racemosi*" in the other species. The male flowers are actually subumbellately racemose on a short common peduncle, so that young (and also some older) inflorescences appear as fascicles of male flowers. Finally, a comparison of the syntype specimen *Rehmann* 4904 (and other specimens from the same region such as *Leendertz* in T.M. 8639, *Meeuse* 9512) with *Schinz* 320 (a syntype of *M. marlothii*) and other specimens from South West Africa clearly shows the identity.

The species has not been collected frequently, but it is probably much more common than the herbarium records would indicate, because this rather inconspicuous plant may have been overlooked. According to an oral communication of Mr. R. G. Strey of the National Herbarium, formerly of the Farm Buellspport, Rehoboth, South West Africa, *M. marlothii* is fairly common in river beds in the Karibib, Okahandja and Rehoboth districts. This species seems to prefer deep sandy soil.

3. *M. cinerea* (Cogn.) A. Meeuse, comb. nov.

Kedrostis cinerea Cogn. in Bull. Herb. Boiss., 2me. sér., 1: 883 (1901); and Pflanzenreich 275.1: 142 (1916); Dinter in Fedde, Rep. 18: 434 (1922). Type: South West Africa, Omaruru, Gifkopje, *Dinter* 1440 (Z, holo.!).

Melothria breyeri Burt Davy, Fl. Transv. 1: 46, 225 (1926). *M. hispidula* Burt Davy, l.c.

Perennial, prostrate or sometimes climbing usually somewhat canescent. *Stems* several to many, produced annually from their thickened and woody corticate bases, slender, herbaceous, sulcate or costate-striate, usually not over 80 cm long, covered with short setose hairs often intermixed with longer pilose-hirsute hairs but usually appearing shortly hispid, ultimately glabrescent. *Leaves* often more or less secund on creeping stems, varying from suborbicular-pentagonal or reniform-cordate to broadly cordate-ovate or cordate-triangular in outline; rounded to acute and sub-acuminate at the apex and with a usually narrow and fairly deep, rarely broad and shallow, basal sinus, undivided and often 5-angled or sometimes distinctly to deeply palmately 3-5 (-7)-lobed, 1.5-6 cm long and about as wide; the margin subentire to minutely denticulate or sometimes distinctly to rarely coarsely crenate-dentate, bluntly dentate or repand, usually shortly ciliate; upper surface usually rather densely and shortly adpressed strigose-scabrid, as a rule slightly more densely so towards the margin, lower surface rather densely and shortly setose-scabrid or punctate-scabrid and not infrequently aculeate-setose on the prominent slender main nerves, both surfaces ultimately turning punctate-scabrid when the stiff hairs wear off; petioles rather slender, sulcate-ribbed and coarsely and shortly hispid like the stems, 0.5-3 cm, rarely up to 4.5 cm, long. *Tendrils* filiform, slender to very slender, hispid as are the stems and petioles. *Flowers* monoecious, light yellow. *Male flowers* in contracted epedunculate few to many (about 20)-flowered racemes, but by reduction sometimes in few-flowered fascicles; pedicels slender, usually under 1 cm long, the lowermost occasionally up to 2 cm, articulated at the apex below the calyx, hispid as are the stems, petioles, tendrils and the rhachis; receptacle narrowly campanulate, rather laxly hispid, 1.5-3 mm long; sepals erect, subulate-triangular, 0.5-1.3 mm long; petals somewhat obovate or oblong-ovate, slightly and shortly hairy, 2.5-4 (-5) mm long. *Female flowers* solitary rarely 2 or 3-nate; pedicels usually short, in fruit rarely exceeding 1.5 cm; ovary long-rostrate, shortly and densely hirsute-pubescent. *Fruit* ovoid-oblong or subglobose-ovoid to somewhat obovoid, usually abruptly contracted into a narrow rostrum, with about 8 fine longitudinal ribs, at first densely and shortly hirsute-pubescent, more or less glabrescent, orange when ripe, 13-19 mm long (with the rostrum) and 8-12 mm in diam., 6-14 seeded. *Seeds* ovate-elliptic much compressed, somewhat contracted at one end, finely rugose, finely or obscurely marginate, 4-6 mm long, 3-4.5 mm wide and 1-1.5 mm thick.

SOUTH WEST AFRICA.—Kaokoveld: Ohopoho, *de Winter & Leistner* 5351 (K, M, PRE). Outjo: near Otjikondo, *de Winter* 3061 (L, PRE, SRGH); Omaruru: Ohere-Oos, *Merxmüller & Giess* 1584 (M, PRE). Karibib: *Dinter* 2505 (PRE, SAM); 6871 (B, BOL, PRE); Okomitundu, *Seydel* 1289 (PRE). Okahandja: Waldau, *Dinter* 377 (PRE, SAM).

TRANSVAAL.—Waterberg or Potgietersrust: Palala River, *Breyer* s.n. (PRE). Pietersburg: Molepo Reserve near P.O. Boyne, *Gerstner* 5356 (PRE). Lydenburg: Sekukuni-land, Driekop, *Barnard* 238; farm Parys, *Barnard & Mogg* 715; farm Het Fort, *Barnard & Mogg* 1011; Nooitgedacht Mt. near Branddraai, *Young* A 714; between Branddraai and Ohrigstad, *Young* A 611; near Ohrigstad, *Young* A 534; Burgersfort, *Meeuse* 10285; Steelpoort, *Meeuse* 10287 (all PRE). Middelburg: near Loskop Dam, *Meeuse* 10328 (PRE). Pilgrims Rest: Graskop, *Mogg* s.n. (PRE). Nelspruit: White River, *Rogers* 25960 (isotype of *M. breyeri* Burt Davy, PRE); *Mogg* s.n. (PRE); Liebenberg 2383 (PRE); Crocodile Poort, *Codd* 7770 (PRE, SRGH); Kaap Muiden, *Rogers* H. No. 24615 (PRE), *Mogg* s.n. (PRE).

SOUTHERN RHODESIA.—Near Zimbabwe, *Wild* 3045 (SRGH).

It is very strange indeed that Cogniaux placed this species in the genus *Kedrostis*, because the holotype is quite adequate and is clearly a *Melothria* (ovary with a disc at the style-base!). Burt Davy quite correctly placed it in *Melothria* and also rightly concluded that it had never been described in *Melothria* before. He had no reason to look for his species under *Kedrostis*. However, Burt Davy found two extreme specimens which he took for two different species, the one with undissected leaves and the other one with deeply palmatisect leaves. He also reported a difference in the female flowers which he described as solitary in *M. hispidula* (described as having lobed to palmatisect leaves) and as "about three-flowered" in *M. breyeri* (described as having undivided leaves). The isotype of *M. breyeri* in the National Herbarium, Pretoria, has only one female flower in a capsule, so that the arrangement of the female flowers can not be verified, but the vegetative parts and numerous male flowers agree quite satisfactorily with the type of *Kedrostis cinerea*. As far as could be ascertained the female flowers are usually solitary but fascicles of 2-3 female flowers as reported by Burt Davy were occasionally observed. As the degree of dissection of the leaves varies a great deal, there can be no doubt that all names cited above refer to one taxon. The field notes indicate that *M. cinerea* is usually found on granite outcrops, sometimes on quartzite or sandstone.

4. *M. parvifolia* Cogn. in Bull. Herb. Boiss. 3: 420 (1895); Pflanzenreich 275.1: 111 (1916); Burt Davy, Fl. Transv. 1: 225 (1926). Syntypes: *Rehmann* 8839, 8842, from Durban, Natal (Z!).

Scandent perennial. *Stems* slender to filiform, glabrous, smooth but sulcate, usually much branched, up to several meters long. *Leaves* membranaceous, broadly ovate-cordate in outline, sparsely and minutely white-punctate to almost glabrous and dark green above, slightly paler glabrous and smooth beneath, 2-4 cm long and broad, 3-5-lobed to the middle or less deeply so with ovate-oblong, angular-lobulate lobes, usually more or less obtuse, apiculate, basal sinus rather shallow, broadly rounded; petioles slender, sulcate, glabrous, 1-2.5 cm long. *Tendrils* filiform, glabrous. *Flowers* dioecious, the male ones racemose, the female ones solitary (always?). *Male flowers*: common peduncle filiform, glabrous, 4-6-flowered, 1-2 cm long; pedicels capillary, erecto-patent, 1-2 mm long; receptacle campanulate, glabrous, about 1.5 mm high and 2.5 mm in diam.; sepals subulate, minute; petals narrowly ovate, obtuse, minutely papillose, about 2 mm long. *Female flowers*: pedicels capillary 4-6 mm long; ovary subglobose, glabrous. *Fruit* globose, smooth, 8-10 mm in diam. *Seeds* narrowly ovate in outline, smooth, obscurely marginate, about 3.5 mm long and 2.5 mm in diam.

Found in Portuguese East Africa, Transvaal, Natal and probably also tropical East Africa.

TRANSVAAL.—Barberton: Komatipoort, *Schlechter* 11777 (according to Cogniaux and Burt Davy, not seen).

PORTUGUESE EAST AFRICA.—Sul do Save: Lourenço Marques district, Masinga, *Schlechter* 12130 (BOL, COI, PRE, Z); Katembe, *Schlechter* 11613 (BOL, GRA, Z); Incanhini, *Schlechter* 12040 (GRA); Goba, *Esteves de Sousa* 110 (PRE); Lourenço Marques, Polana, *Borle* 428 (PRE).

NATAL.—Durban: *Rehmann* 8839, 8842 (syntypes, Z); Durban Bluff, *Meebold* 13155 (M); Isipingo North, *Ward* 832 (NU); Umzinto: Ifafa, *Huntley* 199 (NU).

This species is very close to *M. minutiflora* Cogn. from tropical Africa and may eventually have to be reduced to the latter. For the time being the available material suggests that it is distinct. It differs from nearly all the other South African species of the genus by being quite glabrous in all its vegetative parts, the only other glabrous species (*M. marlothii*) belongs to the monoecious section *Solena*.

Burt Davy, l.c. mentions that "A specimen from Witpoortjie Kloof, Krugersdorp, collected May 1924, may be an immature stage of this". The specimen he obviously referred to is *Moss* 10657 in (J) which I refer to *Trochomeria macrocarpa*.

5. *M. cordata* (Thunb.) Cogn., Mon. Cucurb. 613 (1881); Pflanzenreich 275.1: 114 (1916). Type: in Herb. Thunberg (UPS, photo. in PRE!).
Bryonia cordata Thunb. in Hoffm., Phytogr. Blätt. 5 (1803); Fl. Cap. 34 (1807).
B. punctata Thunb., *B. scabra* Thunb., Prodr. Pl. Cap. 13 (1794); Fl. Cap. 34 (1807).
B. repanda Bl., Bijdr. 923 (1825).
Pilogyne velutina Schrad. in Linnaea 12: 412 (1838).
Zehneria scabra Sond. in Fl. Cap. 2: 486 (1862); Oliv. in Fl. Trop. Afr. 2: 560 (1871).
Melothria punctata (Thunb.) Cogn., Mon. Cucurb. 615 (1881); Pflanzenreich 275.1: 117 (1916), excl. syn. *Bryonia angulata* Thunb. (q.e. *Kedrostis nana*); Burt Davy, Fl. Transv. 1: 225 (1926) et auct. plur., nomen illeg., non *M. punctata* Rafin. (1836).
M. tomentosa Cogn., op. cit., 614 (1881); 115 (1916). *M. membranifolia* Cogn. in Bull. Herb. Boiss. 3: 420 (1895); Pflanzenreich 275.1: 113 (1916). *M. velutina* Cogn., op. cit., 613 (1881); 115 (1916) excl. syn. *Bryonia laevis* Thunb. (q.e. *Ceratiocycos* spec. vide infra).

Climber or occasionally prostrate. *Roots* perennial, fibrous, producing few to many annual herbaceous stems which are usually branched. *Stems* slender, sulcate when dried, glabrous to more or less densely covered with rather short and usually stiff hairs, 1–3 m long, occasionally much longer. *Tendrils* shortly and usually stiffly pubescent, rarely nearly glabrous when young, glabrescent and older parts often becoming quite glabrous. *Leaves* varying from membranous to firmly herbaceous or rigid, when fresh green to dark green above, paler and in hairy forms sometimes canescent below, usually drying a dark brown; in outline usually triangular-cordate but varying from narrowly deltoid with cordate base to suborbicular-cordate, faintly 3–5-angular or sub-trilobed but occasionally deeply 3–5-lobed to a little beyond the middle, usually acute to acuminate and mucronate at the apex and cordate at the base with a usually very distinct and rather deep basal sinus, usually distinctly undulate-dentate with callus-tipped acute teeth, more rarely only shallowly or very coarsely so, as a rule on upper surface sparsely setulose and glabrescent, very often retaining hair-bases as scabrid white dots, on lower surface more densely and more persistently pubescent with short usually stiff hairs but in some forms pubescence is only retained on the principal veins and in others the pubescence is very dense to tomentose, canescent or fulvous; lamina 3–8 cm by 2.5–6 cm, occasionally up to 12 × 9 cm, petioles stiffly pubescent, usually rather sparsely so, 1–3 cm or occasionally up to 5 cm long. *Flowers* dioecious, the male ones subcapitately to subumbellately racemose, the female ones solitary, fasciculate or in a short raceme. *Male flowers* up to about 30 (usually 8–20) per inflorescence; peduncle usually more or less pubescent, sulcate, up to 7 cm occasionally up to 12 cm long; pedicels slender to filiform, patent, usually more or less pubescent; 2–8 mm long; receptacle campanulate, 1.5–5 cm high and 2–3.5 cm in diam., usually more or less pubescent; sepals broadly subulate to triangular-oblong, usually acute, more or less pubescent, 0.5–1 mm long; petals 1.5–2.5 mm long, shortly pubescent; stamens with long hairs near the middle. *Female flowers*: common peduncle, if present up to 6 cm long; pedicels up to 10 mm; ovary subglobose usually sparsely hairy. *Fruits* subglobose or ellipsoid, glabrous, smooth or somewhat foveolate, orange, yellow, red or brown when ripe, 7–12 mm long, 6–10 mm in diam. *Seeds* slightly marginate, smooth, about 4 mm long and 2.5 mm broad.

From Abyssinia along the eastern side of Africa down to the Cape Province, West Tropical Africa, also in the Comores, Madagascar, the Mascarenes and Java.

Recorded from the following districts: *Cape Province*: Cape Peninsula and all coastal districts; in eastern Cape from Aliwal North, Tarka, Queenstown, Somerset East and Uitenhage; eastwards recorded from practically all districts; *Natal*: recorded throughout; *Orange Free State*: Harrismith, Bethlehem, Fouriesburg, Ficksburg; *Basutoland*: many records; *Swaziland*; *Transvaal*: Pietersburg, Letaba, Lydenburg, Pilgrims Rest, Barberton, Ermelo, Brits.

The following specimens are of special interest:

CAPE PROVINCE.—Without exact locality: types of *Bryonia cordata*, *B. punctata* and *B. scabra* (2 sheets) in herb. Thunberg in UPS (photos! in PRE). East Cape: Katriviersberge, *Ecklon & Zeyher* 1788, type number of *M. velutina* in SAM, S (photo., PRE). Alexandria: Olifantshoek, *Ecklon & Zeyher* 1783 (BOL, L, M, PRE), original number cited as "*Pilogyne suavis Schrad.*"; 1784 (M, SAM), cited by Cogniaux under *M. cordata*. Various *Drege* gatherings (in L) cited by Cogniaux under *M. cordata*, *M. velutina* and *M. punctata*.

NATAL.—Inanda: *Wood* 748 (in NH), isotype of *M. membranifolia* Cogn.

An extremely variable species with, accordingly, a great number of synonyms. The variation is found in the shape of the leaves, from the common ovate-triangular-cordate shape to almost reniform-cordate (as in the type) or broadly cordate, in the texture of the leaves from firm and very scabrid to membranous, much smoother (in the form described as *M. membranifolia* Cogn.), in the degree of incision of the leaf-margins from almost entire to coarsely toothed or subserrate or occasionally somewhat more deeply incised to nearly palmatilobed, in the degree of pubescence, slight in certain forms such as those described as *M. membranifolia* but very dense in those referred to *M. tomentosa* by Cogniaux and others; in the length of the male peduncles, size of flowers and degree of development of the female racemes (on a long stalk or flowers almost fascicled). All these forms intergrade.

As regards the nomenclature of this species, the epithets *Bryonia scabra* Thunb. and *B. punctata* Thunb. 1794 are the oldest validly published and legitimate ones, but in *Melothria* they cannot be applied on account of *M. scabra* Naud. and *M. punctata* Rafin., different (American) species, hence the combination *M. punctata* (Thunb.) Cogn. for the species under discussion is illegitimate. The next available name is *Bryonia cordata* Thunb. (1803), the type of which unfortunately represents a form with a less common leaf-shape and short sub-fasciculate female inflorescence (whereas the type of *B. punctata* represents the most common form). The older name *Bryonia angulata* Thunb. (1794) mentioned in the synonymy of "*M. punctata*" by Cogniaux, cannot be considered at all because the type specimen clearly belongs to *Kedrostis nana*.

Melothria velutina Cogn. is a hairy form with a slightly different appearance but I cannot find anything tangible to separate it from *M. cordata*. *Bryonia laevis* Thunb. tentatively placed as a synonym of *M. velutina* by Cogniaux, appears to belong to *Ceratosicyos* (Achariaceae) and is identical with *C. ecklonia* Nees. Thunberg's name antedates the latter name, so that a new combination is necessary, and is now effected.

***Ceratosicyos laevis* (Thunb.) A. Meeuse, comb. nov.**

Bryonia laevis Thunb., Prodr. Pl. Cap. 13 (1794); Fl. Cap. 35 (1807). Type in Herb. Thunberg (UPS, holo., PRE, photo!).

Ceratosicyos ecklonii Nees in Eckl. & Zeyher, Enum. Pl. Cap. 281 (1839); Harv. in Fl. Cap. 2: 501 (1862). Type: *Ecklon & Zeyher* 1797 = 36.10, from eastern Cape (PRE, iso!).

DOUBTFUL SPECIES

M. natalensis Cogn. in Pflanzenreich 275.1: 96 (1916) is a plant that does not agree with any other African species of the genus known to me. The type specimen was destroyed and a duplicate of this gathering (*Rudatis* 515) could not be traced. From the description I am inclined to refer it to *Trochomeria sagittata* (in fact, there is nothing in the rather meagre description that does not apply to this species), which certainly occurs in the area where *Rudatis* 515 was collected.

PROBABLY TO BE EXCLUDED FROM THE SOUTH AFRICAN FLORA

M. tridactyla Hook. f. in Oliv., Fl. Trop. Afr. 2: 562 (1871). Cogniaux (1916) cites a specimen from East London (leg. O. Kuntze) which I have not seen. The nearest localities of *M. tridactyla* that have been recorded are in the southern part of Portuguese East Africa, so that it is most unlikely that this tropical species would occur near East London and not have been recorded from elsewhere in the Union. I am at a loss to suggest the true identity of Kuntze's specimen; it might not even be a *Melothria* and it is not at all unlikely that it is *Trochomeria sagittata*, whose vegetative parts resemble some species of *Melothria* sect. *Melothria*.

EXCLUDED SPECIES OF MELOTHRIA

M. hederacea (Sond.) Cogn. (*Zehneria hederacea* Sond.) = *Kedrostis nana* (Lam.) Cogn., see p. 30.

5. OREOSYCE

Oreosyce Hook. f. in Fl. Trop. Afr. 2: 548 (1871), ("Oreosycios", sphalm. in clavis, op. cit. 522); Cogn., Mon. Cucurb. 564 (1881); Baill., Hist. Pl. 8: 449 (1886); Pax in Pflanzenfam. 4, 5: 15 (1889); Cogn. in Pflanzenreich 275.1: 67 (1916).

Cucumis Auct., pro parte, exclus. type.

Hymenosicyos Chiov. in Ann. di Bot. 9: 62 (1911); Harms in Notizbl. Bot. Gart. Berlin 8: 485 (1923); Pflanzenreich 275.2: 157 (1924).

Scandent herbaceous plants with usually slender stems, often hispid or sparsely to densely covered with short rather stiff hairs. *Leaves* petiolate, undivided to more or less distinctly palmately 3-5-angled, -lobed or -fid. *Tendrils* simple. *Flowers* monoecious, small, yellow, pedicellate; male flowers solitary or fascicled; receptacle cylindrical-campanulate, hispid; sepals dentiform or subulate; corolla rotate to campanulate with oblong segments; stamens 3, subsessile in the middle of the receptacle, dorsally attached in their middle; anthers slightly cohering or free, linear or oblong, two 2-theous and the third 1-theous.; thecae straight, obtuse; connective narrow, usually produced at the apex as a small tooth; rudiment of pistil gland-like; *female flowers* solitary, usually borne in different axils from those bearing the male ones; calyx and corolla as in the male; staminodes 3, small or sometimes well-developed and apparently fertile stamens present; ovary fusiform, oblong or ellipsoid, setulose, with 3 placentae and numerous horizontal ovules; style columnar, surrounded by a disc at the base; stigma 3-lobed, the lobes oblong, usually fringed. *Fruit* rather small indehiscent, ellipsoid or ovoid, covered with hairy or bristly protuberances intermingled with long setae, many-seeded. *Seeds* much compressed, ovate in outline, margined.

Type species: O. africana Hook. f. (the genus was monotypic when described).

Found in tropical Africa, extending into Angola, the Transvaal, Abyssinia and Somaliland.

Oreosyce seems to be a perfectly natural genus, although its author did not realise that several species he described himself in *Cucumis* belong here. These species differ from true *Cucumis* species in the first place in the straight anther-thecae. It is an established fact that straight or slightly curved anthers occur in certain subfamilies of the Cucurbitaceae such as the Melothrieae whereas sigmoid conduplicate thecae are characteristic of the Cucurbitae. The fruit of *Oreosyce* bears both protuberances and setae, and it contains marginate seeds whereas the fruits of *Cucumis* are smooth or hairy or covered with protuberances, but not covered with both soft spines and setae, and contain emarginate seeds, facts which were noticed by Hooker f. and is evident from his remarks sub "*Cucumis*" in Fl. Trop. Afr. 2: 542. Probably owing to the fact that of *Oreosyce africana* no fruits were known at that time, Hooker overlooked the connection of these "aberrant" species of *Cucumis* with the Melothrieae and with *Oreosyce*. As Hooker attributed much importance to the presence or absence of an apical extension of the connective and *Oreosyce* as well as the "aberrant" species of *Cucumis* have, apart from the straight thecae, a small apical appendage of the connective or none at all, whereas *Cucumis* proper has a broad and conspicuous appendage, it is strange that he did not associate these "aberrant" species with *Oreosyce*.

In 1911 Chiovenda described a genus *Hymenosicyos*, based on one of Hooker's "aberrant" species of *Cucumis* (*C. membranifolius* Hook. f.). Chiovenda's work was critically discussed by R. E. Fries in Wiss. Ergebn. Schwed. Rhodesia-Kongo-Exped. 1911-12, Bot. 1, 2: 310 (1916). Fries pointed out that there were some discrepancies between his own observations and the characters mentioned by Chiovenda and ventured the opinion that *Hymenosicyos* Chiov. is very closely related to *Oreosyce* Hook. f. However, he did not go so far as actually to reduce the former to the older genus *Oreosyce*. Harms (op. cit., 1923, p. 485) did not add much evidence to Fries's observations. He agreed that *Hymenosicyos* hardly differs from *Oreosyce*, but instead of taking the final step and sinking Chiovenda's genus, he transferred a few species described by Cogniaux in *Oreosyce* to *Hymenosicyos*. It is true that in these species the connective is produced at the apex, whereas in a syntype specimen of *Oreosyce* (Mann 2025, K) this is apparently not the case, but the appendage of the connective is never so obvious to be sufficient for a generic distinction. Mr. Killick informed me that the specimen *Boughey* 176 from the same locality as Mann 2025 and an exact match of it has the connective slightly produced above the anthers as in "*Hymenosicyos*". Cogniaux was apparently unaware of the relation between *Hymenosicyos* (which he retained in *Cucumis*) and *Oreosyce*, because he redescribed *Cucumis membranifolius* Hook. f. again as *Oreosyce villosa* and *O. triangularis*.

There is very little doubt that *Hymenosicyos* is nothing but a synonym of *Oreosyce*, and all the species referred to the former genus by Chiovenda and by Harms have to be transferred to or retained in *Oreosyce*. The re-descriptions of the same species in the various genera involved have naturally caused a considerable synonymy. If all the species described as *Cucumis*, *Hymenosicyos*, or *Oreosyce* that are congeneric are sorted out, the total number of valid species of *Oreosyce* will most probably not exceed 4 or 5. One species, which is wide-spread, extends the range of the genus into the Transvaal. In view of the synonymy involved a number of synonyms relating to and specimens hailing from tropical Africa are cited.

O. subsericea (Hook. f.) A. Meeuse, comb. nov.

Cucumis subsericeus Hook. f. in Fl. Trop. Afr. 2: 545 (1871); Cogn., op. cit. 506 (1881); 153 (1924). Type: *Welwitsch* 838, Pungo Andongo, Angola (K, holo.). *C. membranifolius* Hook. f., l.c. 545 (1871); Cogn., l.c. 506 (1881); 153 (1924). *C. cecili* N.E. Br. in Kew Bull. 1906: 104 (1906); Cogn., l.c. 148 (1924). *Oreosyce triangularis* Cogn. in Bot. Jahrb. 21: 207 (1895); Pflanzenreich 275.1: 68 (1916); Burttt Davy, Fl. Transv. 1: 226 (1926), as to name only. *O. villosa* Cogn., op. cit. 68 (1916). *O. aspera* Cogn. and *O. parvifolia* Cogn., op. cit. 268 (1916).

O. bequaertii De Wild. in Revue Zool. Afr. 9, 3: 90 (1921); Pl. Bequaert 4: 558 (1922). *Hymenosicyos membranifolius* (Hook. f.) Chiov. in Ann. di Bot. 9: 63 (1911); R. E. Fries in Wiss. Ergebn. Schwed. Rhod. Kongo Exped. 1911-12, Bot. 1, 2: 310 (1916); Harms in Notizbl. Bot. Gart. Berl. 8: 486 (1923); Pflanzenreich 275.2: 157 (1924). *H. subsericeus* (Hook. f.) Harms, op. cit. 487 (1923); 158 (1924). *H. bequaerti* (De Wild.) Harms, op. cit. 159 (1924); Robyns, Spermat. Nat. Parc Albert 2: 393 (1947). *H. villosus* (Cogn.) Harms, *H. triangularis* (Cogn.) Harms, op. cit. 487 (1923); 159 (1924). *H. bryoniifolius* Merxm. in Mitt. Bot. Staatssamml. Munchen H 6: 205 (1953).

Stems usually rather slender, longitudinally sulcate-striate, at first shortly setose-hirsute on the ribs with bulbous-based hairs, glabrescent, the hair-bases often persistent, rendering the stems finely scabrid or scabrid-muriculate. *Leaves* thinly herbaceous varying from distinctly 3-5-lobed to triangular with cordate base, with sub-acute to acuminate apex, the lobes, if present, rounded when small, acute or acuminate when conspicuous; the margin sub-entire to sinuous or somewhat dentate, usually minutely and rather remotely callosio-ciliate; the blade 2-8 cm long and 1.5-7.5 cm broad near the base; on both surfaces with fine stiff straight and somewhat bulbous-based adpressed hairs, more densely so beneath, sometimes ultimately becoming finely scabrid if hairs fall off, but usually pubescence persistent; petioles retrorsely setose-hispid, glabrescent and becoming scabrid, 1-12 cm long. *Tendrils* usually somewhat setulose with bulbous-based hairs. *Male flowers*: pedicels slender, 0.5-2 cm long, setulose; receptacle 2.5-4 (-5) mm long, more or less densely setulose-hirtellous as are the 1-3 mm long subulate-linear sepals; corolla yellow; the lobes usually shortly hairy mainly on the nerves outside, 4-8 mm long. *Female flowers* usually slightly larger than the male ones on the same plant, on usually somewhat incrassate peduncles 0.5-4 cm long; ovary ovoid or elliptic, densely bristly. *Fruit* yellow or orange when ripe, broadly ellipsoid or ovoid; in the specimens seen up to 18 mm long and 12 mm in diam. *Seeds* elliptic-oblong, attenuate at the one end, 5-6 mm long and 2-3 mm broad.

Found in Africa south of the Sahara, southwards to Angola, S. Rhodesia and the northern Transvaal, also in Abyssinia.

TRANSVAAL.—Soutpansberg: near Louis Trichardt, *Blenkiron & Young* in Hb. Moss No. 14537 (J, PRE). Letaba: Shilovane, *Junod* 59 (PRE).

SOUTHERN RHODESIA.—Salisbury: near Salisbury, *Eyles* 4763 (SRGH). Makoni: Rusape, *Dehn* R 25/52 (Type of *Hymenosicyos bryoniifolius*, M, isotype SRGH). Umtali: *Chase* 4777; 5214 (SRGH); 6042; 6222 (SRGH, PRE). Urungwe: Msukwe River, *Wild* 4209 (SRGH); Distr.? Stapleford, *Gilliland* 378 (SRGH).

NYASALAND.—Zomba Plateau: Zomba, *Brass* 16315 (SRGH).

TANGANYIKA.—Nyasa.: Kyimbila, *Stolz* 335 (L, M). Kilimanjaro: Namui River, *Endlich* 291 (M). Moschi: *Wallace* 1072 (EA, PRE). Usambara: Mlalo, *Holst* 630 (type gathering of *Oreosyce triangularis*, fragment of type in BR).

BELGIAN CONGO.—Ruwenzori: Kisuki, *Bequaert* 4703 (type of *Hymenosicyos bequaertii*, BR, holo.); Tshibinda (W. of Lake Kivu), *Humbert* 7385 (PRE).

As Mr. Killick has pointed out, there is a difference between the type species *Oreosyce africana* and the specimens cited above in the shape of the leaves which are much more acuminate in *O. africana*. As the fruit of the type species is apparently still unknown (see Keay, Fl. W. Trop. Afr. ed. 2: 210) and may be different from that of *O. subsericea*, it seems better not to take up the name *O. africana* for the cited specimens.

Hooker published *Cucumis subsericeus* and *C. membranifolius* on the same page, but in this order, and the first name was chosen for the new combination made in *Oreosyce*. *O. triangularis* Cogn. is based on *Holst* 630 which differs slightly in the leaf-shape, but is otherwise not essentially different. However, the specimen *Junod* 2622 (in *Z!*), cited by Cogniaux under this name in *Pflanzenreich* is not this species at all, but *Melothria maderaspatana*. Burt Davy cites "*Jun.* 2622 fide Cogn." in his *Fl. Transv.* under *O. triangularis* and thus repeated Cogniaux's error. Ironically, the species does occur in the Transvaal after all.

6. KEDROSTIS

Kedrostis Medik., *Phil. Bot.* 2: 69 (1791); Cogn., *Mon. Cucurb.* 632 (1881); *Pflanzenreich* 275.1: 138 (1916); Pax in *Pflanzenfam.* 4, 5: 17 (1889); Phillips, *Gen. ed.* 2: 746 (1951).

Coniandra Schrad. in Eckl. & Zeyh., *Enum. Pl. Afr. Austr.* 2: 276 (1836) et *Reliq.* in *Linnaea* 12: 403 (1838); Sond. in *Fl. Cap.* 2: 483 (1862).

Cyrtonema Schrad., op. cit. 276 (1836) and 403 (1838).

Rhynchocharpa Schrad., op. cit. 403 (1838); Naud. in *Ann. Sci. Nat.*, 4me. sér., 12: 146 (1859); Benth. & Hook. f., *Gen. Pl.* 1: 531 (1897); Hook. f. *Fl. Trop. Afr.* 2: 563 (1871).

Pisosperma Sond. in *Fl. Cap.* 2: 498 (1862), Benth. & Hook. f., op. cit., 831; Harv., *Gen. S. Afr. Pl. ed.* 2: 126 (1868); Cogn., *Mon. Cucurb.* 631 (1889) and *Pflanzenreich* 275.1: 136 (1916); Pax, op. cit., 17; Phillips, op. cit., 746.

Toxanthera Hook. f. in Hook., *Icon. Pl.* 15, t.1421 (1883); Pax, op. cit., 17; Cogn., op. cit. 137 (1916); Phillips, op. cit., 746.

Type species: *Bryonia africana* L. (cited by Medikus) = *K. africana* (L.) Cogn.

Perennials, often with tuberous rootstock forming annual herbaceous prostrate or scandent stems, often foetid with a smell resembling carbon disulphide. *Leaves* various, entire, lobed or more or less deeply palmately or sometimes pinnately dissected, usually distinctly petiolate. *Tendrils* simple or occasionally (in the subgenus *Toxanthera*) bifid. *Flowers* monoecious, rarely dioecious, often small to minute, whitish, yellowish or greenish. *Male flowers* racemose, subcorymbose or subumbellate on a usually distinct common peduncle; pedicels often slender; receptacle varying from widely and shortly campanulate to cylindric-campanulate; sepals varying from ovate to linear-lanceolate, often pubescent or glandular-pubescent outside; corolla-lobes ovate, elliptic or oblong, often pubescent, papillose or glandular outside; stamens 3, rarely 4 or 5, inserted in the receptacle; filaments free, usually short; anthers cohering, usually one 1-thecous and two 2-thecous (when 5 stamens present all monothealous); thecae straight or more or less curved; connective often produced, entire, bifid or bi-partite; rudiment of pistil 0 or sometimes present, small, glandlike, very rarely distinct. *Female flowers* solitary or occasionally fascicled or clustered, usually shortly pedicelled to sessile; receptacle, calyx and corolla as in the male flowers; staminodes 0-5, often 3, usually small or linear or filiform; ovary ovoid to subglobose or elliptic; sometimes (mainly in the subgenus *Toxanthera*) oblong or narrowing into a beak, with 3 or sometimes 2 placentas and few or (in the subgenus *Toxanthera*) rather many ovules; style elongated or short, columnar, without or with an indistinct disc at the base; stigmas 2 or 3 or cohering and apparently simple, often thick and each usually more or less shortly bilobed. *Fruit* indehiscent, usually smooth, fleshy, small, ovoid or subglobose or (in the subgenus *Toxanthera*) rather large, often beaked, few- to many seeded, usually red when ripe. *Seeds* globose to ellipsoid, often margined; testa smooth, crustaceous; tegmen thin, membranous; cotyledons thick and fleshy, radicle short conical.

Mainly an African genus, but extending to India. Cogniaux, in his monographic treatment of the genera *Kedrostis*, *Toxanthera* and *Pisosperma* recognised 33, 3 and 1 species respectively. One can safely assume that, after a critical re-examination, the number of species, even after the inclusion of *Toxanthera* and *Pisosperma*, will prove to be considerably less (about 20).

The characters used to distinguish *Toxanthera* and *Pisosperma* from *Kedrostis* break down altogether. The presence or absence of a produced apical part of the connective is not a reliable character. A study of several authentic specimens makes it clear that specimens that are identical with "*Pisosperma capense*" Sond. have been referred to a variety of *Kedrostis zeyheri* by Sonder himself and also by Cogniaux and that specimens which are undoubtedly conspecific with *Toxanthera natalensis* and *T. lugardae* have been described as species of *Kedrostis* by Cogniaux and others and in fact agree altogether with the section *Cogniauxiana* of *Kedrostis*. The natural solution is to reduce these genera to *Kedrostis*. It is true that the species referable to the section *Cogniauxina* O. Ktze differ in several respects slightly from typical species of *Kedrostis* (the fruits are much larger, the tendrils often bifid), but these differences are not important enough for generic distinction. The proposed reductions and the Code of Botanical Nomenclature necessitate the following changes in the nomenclature of the sub-genera:

1. *Kedrostis* Medik. subgenus **Kedrostis** (= *Typokedrostis* Cogn.). This includes *Pisosperma* Sond.

2. *Kedrostis* Medik. subgenus **Toxanthera** (Hook. f.) A. Meeuse, stat. nov. *Toxanthera* Hook. f., l.c. (pro gen.). *Kedrostis* sect. *Cogniauxina* O. Ktze. in Post & O. Ktze., Lex. Gen. Phaner. 107 (1903); Cogn. in Pflanzenreich 275.1: 150 (1916). Type species: *Toxanthera natalensis* Hook. f. = *K. natalensis* (Hook. f.) A. Meeuse. Distinguishing characters: *Male flowers* racemose, connective not produced at the apex (often produced in the subgenus *Kedrostis*). *Ovary* fusiform or long-cylindric. *Fruit* large, oblong-fusiform, smooth, many-seeded. *Tendrils* usually bifid.

3. *Kedrostis* Medik. subgenus **Gilgina** Cogn., op. cit. 155 (1916). This subgenus, not represented in Southern Africa, is characterised by fascicled male flowers, a large ovoid fruit covered with thick soft spines, compressed seeds and spinescent tendrils.

Tendrils simple:

Leaves undivided, softly herbaceous drying thin (and often papery); plants softly hairy, monoecious, usually bearing the minute male and female flowers in the same axils, the male ones on very slender pedicels in short, few-flowered and often contracted racemes, the female ones sessile; ovary globose, hairy; fruit sessile, globose, with a small apiculus or (in S. Africa) more rarely long-rostrate..... 1. *K. foetidissima*

Leaves more or less distinctly lobed or dissected, or if undivided, plants not as above:

Flowers appearing before the leaves..... 2. *K. capensis*

Flowers appearing when leaves are present:

Dioecious*..... 3. *K. nana*

Monoecious*:

Male and female flowers borne in the same axils, minute:

Ovary globose, fruit spherical with an abrupt short apiculus or without any apiculus; male raceme on a distinct common peduncle; leaves herbaceous..... 4. *K. africana*

Ovary more or less elongate; fruit long-rostrate; male raceme reduced so that flowers appear almost fascicled; leaves somewhat succulent..... 5. *K. crassirostrata*

Male and female flowers borne in different axils:

Male flowers with papillose suberect corolla-lobes; ovary ovoid; fruit ovoid to sub-globose up to 3 cm long; vegetative parts usually covered with soft white curved hairs; leaves usually deeply dissected with narrow, often toothed pinnatilobed segments, up to 7 cm long..... 2. *K. capensis*

*As the male flowers are usually protandrous, some specimens appear unisexual and suggest dioecy. If such a specimen does not agree with *K. nana*, the other part of the key should be tried. (*K. nana* is a climber, mainly in scrub and on bushes, occurring in the coastal and some adjoining districts from the Cape Peninsula to the southern half of Natal, the other species are either manifestly monoecious or do not occur in the same region).

Male flowers with usually spreading corolla-lobes which are often hairy but not distinctly papillose; ovary linear-fusiform; fruit oblong-fusiform, 4–8 cm long; vegetative parts usually hairy but not with soft white curved hairs; leaves, if dissected, not more deeply so than a little beyond the middle and lobes broad, finely denticulate along the margin, blade up to 16 cm long..... see 6 *K. natalensis*

Tendrils bifid..... 6. *K. natalensis*

1. ***K. foetidissima*** (*Jacq.*) *Cogn.*, Mon. Cucurb. 634 (1881); Pflanzenreich 275.1: 140 (1916); Dinter in Fedde, Repert. 18: 434 (1922); Burt Davy, Fl. Transv. 1: 226 (1926); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 179 (1931); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 175 (1950).

Trichosanthes foetidissima Jacq., Collect. 2: 341 (1788); Icon. Rar. 3: t.624 (1793).

Melothria foetida Desr. in Lam., Encycl. Méthod. 4: 87 (1797); Ser. in DC., Prodr. 3: 313 (1828).

Rhynchoscarpa foetida (Desr.) Schrad. in Linnaea 12: 403 (1828); Naud. in Ann. Sci. Nat., 4me. sér. 12: 146 (1859), 16: 176 (1862); Hook. f., Fl. Trop. Afr. 2: 564 (1871).

Type: not seen; the plate in Icon. Rar. 3, t.624 was taken to be representative.

Perennial with tuberous rootstock. *Stems* annual, herbaceous, climbing (or occasionally prostrate when no support is available), usually slender, often branched, reaching 1–2 m, at first long and softly pilose, or sometimes shortly pubescent, occasionally glabrous, hairy ones glabrescent. *Leaves* herbaceous, varying from ovate-cordate to sub-orbicular-cordate or sub-triangular-cordate, undivided or faintly 3–5-lobed with short obtuse lobes; the apex varying from obtuse to shortly cuspidate, the cordate base usually with a narrow and fairly deep sinus, the margin more or less distinctly callosio-denticulate or undulate to dentate or entire; both surfaces usually with rather long, soft to very short stiff hairs turning scabrid especially so above; petioles usually short, often shortly and densely hairy. *Flowers* monoecious. *Male flowers* in short 1–7-flowered racemes; common peduncle usually very slender, filiform, pubescent, up to 3 cm long; pedicels very slender, usually erecto-patent, up to about 1 cm long; calyx hairy, rarely glabrous; petals more or less hairy or papillose-hairy, 2–5 mm long, rarely only about 1.5 mm long. *Female flowers* solitary in the same axils as the male racemes, sessile or sub-sessile (pedicels up to about 5 mm long, shortly hairy); ovary subglobose, shortly or long-beaked, softly pilose, 2–3 mm in diam. *Fruit* red when ripe, few-seeded, covered with long patent hairs usually thinly so, rarely quite glabrous. *Seeds* often 4, ovoid, somewhat compressed, distinctly margined, margin usually shortly winged, truncate or notched on the attenuate end, 4–6 mm × 3–4 mm × 1.5–2 mm; testa finely granulated or nearly smooth.

Africa south of the Sahara to South Africa, Eritrea and Somaliland. *Kedrostis rostrata* (Rottl.) Cogn., op. cit. 636 (1881) from India can most probably not be separated from this species.

This plant occurs in two different forms which are here treated as sub-species, because the only constant and important difference is in the shape of the fruits; those of the typical subspecies are long-rostrate and those of the other subspecies are subglobose, abruptly and very shortly rostrate or erostrate.

(a) ***K. foetidissima*** subsp. ***foetidissima***.

K. foetidissima var. *perrottetiana* (Ser.) Cogn., op. cit., 635 (1881) and 141 (1916), var. *genuina* Cogn., l.c., and var. *divergens* (Hochst.) Cogn., l.c. (cum syn.).

Leaves 1.5–12 cm long, 0.5–9 cm wide, subsessile or petioles up to 6 cm long; basal sinus varying from rounded, semi-orbicular about 0.5 cm deep to narrow, up to 2 cm deep, or to more or less rectangular, up to 2 × 2 cm. *Fruits* ovoid, 15–22 mm long with a 10–15 mm long sublinear or narrowly conical straight or falcate rostrum, lengthwise marked with thick nerves.

Distribution as the species, but rare in southern Africa.

TRANSVAAL.—Soutpansberg, between Chipise and the Nuanetzi River; *Gerstner* 6072 (BOL, PRE).

Cogniaux (1916) also records it (as var. *genuina*) from Lourenço Marques but the cited specimen (*Schlechter* 11678) as represented in BOL and GRA, is the subspecies *obtusiloba* (see below). Another gathering cited by Cogniaux as the var. *genuina*, viz. *Gerrard* 375 = *McKen* s.n., most probably also belongs to the subsp. *obtusiloba* because all specimens from Natal and Zululand belong to this subspecies as far as can be ascertained.

(b) *K. foetidissima* subsp. *obtusiloba* (*Sond.*) *A. Meeuse*, stat. nov.

Zehneria obtusiloba E. Mey. ex *Sond.* Fl. Cap. 2: 487 (1862).

Bryonia obtusiloba E. Mey. ex *Drege*, Zw. Pflzgeogr. Doc. 156, 169 (1843), nomen tantum.

Melothria obtusiloba (*Sond.*) *Cogn.* op. cit. 616 (1881).

Kedrostis foetidissima var. *microcarpa* *Cogn.*, op. cit. 635 (1881) and 141 (1916); *Burt Davy*, l.c. *K. minutiflora* *Cogn.* in Bull. Herb. Boiss. 2me. sér. 1: 884 (1901), and in Pflanzenreich 275.1: 144 (1916); *Dinter* in Fedde, Repert. 18: 434 (1922). *K. obtusiloba* (*Sond.*) *Cogn.* in Pflanzenreich 275.1: 143 (1916); *Burt Davy* l.c.

Type: A specimen collected by *Drege* near the Umzimkulu River in the eastern Cape Province or southern Natal in herb. Sonder (now in S). Sonder cited several specimens in his description in Flora Capensis, but as he took up the manuscript name (*Bryonia obtusiloba*, given by E. Meyer, *Drege's* gathering automatically becomes the type.

Found in Angola, Southern Rhodesia, Portuguese East Africa and South Africa. Recorded from the following districts: *South West Africa*: Ovamboland, Okavango, Outjo, Grootfontein, Okahandja, Otjiwarongo, Windhoek; *Transvaal*: Soutpansberg, Sibasa, Letaba, Pietersburg, Potgietersrust, Waterberg, Pretoria, Bronkhorstspuit, Brits, Lydenburg, Carolina, Marico; *Natal*: Ingwavuma, Nongoma, Weenen, Estcourt, Umvoti, Impendhle, Camperdown, South Coast; *Cape Province*: Vryburg, Kuruman, Barkly West, Hay, Kimberley.

Some interesting specimens are the following:

SOUTH WEST AFRICA.—Okahandja: *Dinter* 428 (cited by Cogniaux 1916 as *K. minutiflora* *Cogn.*, SAM, PRE); Outjo, Etero: *Dinter* 1444 (holotype of *K. minutiflora*, Z); Windhoek, Auas Mts., Northern foothills: *Dinter* 1895 (cited by Cogniaux 1916 as *K. obtusiloba*).

TRANSVAAL.—Magalakwin River (Prob. Waterberg distr.): *Schlechter* 4275 (BOL, GRA), cited by Cogniaux 1916 and *Burt Davy* as *K. obtusiloba*; Pretoria or Bronkhorstspuit distr.: *Rehmann* 4810 (Z) cited by Cogniaux 1916 as *K. foetidissima* var. *microcarpa* *Cogn.*

The type gathering of *Zehneria obtusiloba* *Sond.* was not studied, but from other specimens referred here by Cogniaux (*Schlechter* 4275, *Dinter* 1895) it is quite clear that this species cannot be separated from *K. minutiflora* *Cogn.* (of which the type, *Dinter* 1444, and two specimens of *Dinter* 428, referred to this species by Cogniaux were available for study) nor from *K. foetidissima* var. *microcarpa* *Cogn.* The differences mentioned by Cogniaux (1916) are not satisfactory, at any rate, in his key (on p. 139) every specimen with subglobose fruits without a long rostrum would key out as *K. obtusiloba* or *K. minutiflora*, but never as *K. foetidissima* and one would not arrive at the non-rostrate varieties of the latter. In addition, Cogniaux's description of *K. minutiflora* as "glaberrima" does not hold true; the specimen *Dinter* 1444 in Z, apparently the holotype, is not quite glabrous on stems, receptacle and fruits as indicated in the key on p. 139 of Cogniaux's 1916 monograph.

2. *K. capensis* (Sond.) A. Meeuse, comb. nov.

Pisosperma capense Sond. in Fl. Cap. 2: 498 (1862); Cogn., Mon. Cucurb. 632 (1881); Pflanzenreich 275.2: 136 (1916); Phillips, Fl. Basutol. [Ann. S. Afr. Mus. 16: 101 (1917)].

Perennial. *Stems* annually produced from a tuberous subglobose or napiform up to 10 cm thick rootstock, when young suberect and short, but later prostrate and attaining a length of not more than 40–50 cm, herbaceous, usually rather slender, angular-striate, covered like all vegetative parts with short white curved hairs, very rarely quite glabrous. *Leaves* usually secund, almost invariably firm, greyish green, ovate to oblong in outline, the first-formed undivided to pinnatilobed or palmately lacerated with a truncate-hastate to broadly and shallowly cordate base, up to about 4 cm long and 3 cm wide, but later usually very deeply palmatifid with 5–7 oblong, lanceolate or linear, entire, toothed or occasionally pinnatilobed segments, up to 7 cm long and about 5 cm wide, the segments often linear (if so 2–3 mm wide); the lateral ones shorter than the central ones, the lowermost usually much smaller often bilobed, the typical pubescence of curved white hairs usually confined to the margin on upper surface, but thinly dispersed on the lower and usually slightly paler lower surface; petioles 4–15 mm long. *Tendrils* reduced or short or wanting. *Flowers* monoecious, sometimes appearing before the leaves, the male ones in (sometimes short or contracted) racemes or fascicles (by reduction rarely solitary), the female ones solitary in different axils. *Male flowers*: common peduncle often rather stout, up to 6 cm but usually under 4 cm long, few-flowered or occasionally up to about 20-flowered; more or less hairy to subglabrous or hairy towards the apex; pedicels filiform, very slightly thickened towards the apex, shortly hairy or puberulous, up to 3 cm long, usually with subulate-filiform bracteoles at the base; receptacle 3–6 mm long, shortly hairy like the pedicels or rarely subglabrous, sepals triangular or triangular-ovate, sub-acute to acute, erect or erecto-patent, 1–2 (–3) mm long, usually hairy; petals pale yellow or greenish yellow, ovate, oblong, obtuse to subacute, 3–6 (–8) mm long, densely papillose. *Female flowers*: pedicels short, in fruit not exceeding 1 cm; ovary ovoid, usually hairy; staminodes 3–5, linear or ligulate. *Fruit* subglobose to ovoid or oblong, shortly rostrate, ultimately glabrous, 1.5–2.5 (–3) cm long and 1–1.5 cm in diam., few- (to 10-)seeded. *Seeds* thick, about 5–6 × 4–5 × 3–4 mm.

Type specimen: Sonder cited several gatherings (*Zeyher*, *Drege*, *Barber*). The only original specimens of which one can be sure that Cogniaux has also studied them, are the specimens *Zeyher* Cucurb. No. 1 and *Zeyher* No. 593, in the Kew herbarium. A specimen in SAM collected by *Zeyher* has no original number; a number in pencil (285) does not agree with the cited number (593), but the locality is Caledon River and it is almost certainly a duplicate of one of the original gatherings cited by Sonder.

SOUTH WEST AFRICA.—Keetmanshoop: Great Karasberg, Narudas Süd, *Pearson* 8523; 8524; 8525 (BOL).

CAPE PROVINCE.—Little Namaqualand: Goodhouse, *Marloth* 14046 (PRE); grown from seed collected in the Richtersveld, Doorn River: *Herre* Hb. no. 25599 (BOL); Vaalheuwel, *Acocks* 19423 (PRE); Spektakel, *Bolus* 9509 (BOL). Clanwilliam: Lamberts Bay, Van Pullensvlei, *Pole Evans & van Nouhuys* 32. Ceres: Karroo Poort, *Leipoldt* 3462; 5712 (BOL). Laingsburg: Whitehall, *Compton* 3012; 4437 (BOL); 8638; 13927 (NBG). Prince Albert: Zwartberg Pass, *Bond* 847 (NBG). Beaufort West: Kromrivier, *Goatcher* Hb. no. 1016 (BOL); Nelspoort, Courland's Kloof, *Pearson* 1470 (SAM); Rhenosterkop, *Burke* 143 (SAM). Willowmore: Kommando-kraal, *Zeyher* 861 (SAM). Graaff Reinet: *Bolus* 296 (BOL). Cradock: *Acocks* 16317 (BOL, PRE). Middelburg: Wapadsberg Plateau, *Acocks* 16214 (PRE). Tarka: Tarkastad, *Wilmot* s.n. Bedford: near Cookhouse, *Acocks* 11910 (PRE). Fort Beaufort: near Blinkwater, *Story* 1676 (PRE). Somerset East or Uitenhage: Zuurberg, *Holland* 296 (GRA). Molteno/Sterkstroom: *Andriesberg*, *Galpin* 2181 (GRA, PRE,

BOL). Aliwal North: *F. Bolus* 207 (BOL). Komgha: *Flanagan* s.n. (SAM). Hay: Niekerk's Hoop, *Wilman* 1410 (KMG, BOL); 2398; 2399 (KMG); Rietkloof, *Acocks* 8555 (KMG); Blaauwbosputs, *Acocks* 2009 (KMG); Floradale, *Ferrar* Hb. no. 6145 (KMG); *Esterhuysen* 2308 (BOL, PRE). Barkly West: Geluk, *Acocks* 1469 (KMG). ORANGE FREE STATE.—Kroonstad: *Moss* 7434 (J); *Pont* 363a (PRE); 365c (PRE, SRGH). Bloemfontein: *Potts* 499 (BOL); *Mostert* 355 (PRE). Without precise locality, Caledon River, *Zeyher* 285 (?) in SAM; Bloemfontein or Fauresmith: *Rehmann* 3679 (Z).

BASUTOLAND.—Leribe, Thaba Phatsoa, *Dieterlen* 194a; 194b (PRE).

Apart from the fact that the *Zeyher* specimen from the Caledon River in SAM is most probably a duplicate of an original specimen, the identity of this species can easily be established from other specimens cited by Cogniaux (1916), such as *Rehmann* 3679 and *Galpin* 2181.

K. capensis is much more variable than one would expect from Sonder's or Cogniaux's descriptions. Sonder laid a great deal of stress on the supposed precocious nature of the flowers, but this phenomenon is incidental and certainly not a generic character. Cogniaux (1916, p. 132) keys out the genus *Pisosperma* by using the absence or presence of an apical connective appendix as a main distinguishing character, but this is fallacious and this author has cited specimens belonging to *K. capensis* under species of *Kedrostis* instead of under *Pisosperma*. These specimens with well developed leaves appear for instance as *K. zeyheri* var. *angustiloba* (Sond.) Cogn. (op. cit. 1881, p. 642, 1916, p. 148), viz. *Burke* 143 from Rhenosterkop (already referred to *Coniandra zeyheri* var. *angustiloba* by Sonder, 1862, p. 485), or as *K. zeyheri*, viz. *Bolus* 296 from Graaff Reinet (Cogn. op. cit. 1881, p. 642, 1916, p. 148). The specimen *Bolus* 296 in BOL has an annotation in Dr. H. Bolus's handwriting: "*Coniandra digitata* Sond. fide Dr. Sonder". Cogniaux (op. cit. 1881 and 1916) cites *Burke* 143 under *K. digitata* and the same number, as was stated above, under *K. zeyheri* var. *angustiloba*. These are additional examples of the confusion that existed in the genus *Kedrostis* (s.l.), some of which can be traced back to Sonder's treatment in *Flora Capensis*, but are mostly due to Cogniaux's not sufficiently critical treatments of the genus and the allied genera *Toxanthera* and *Pisosperma* (here reduced to the synonymy of *Kedrostis*).

K. capensis can always be distinguished from related species of *Kedrostis* by the following characters:

1. The monoecious flowers (dioecious in forms of *K. zeyheri*).
2. The typical hairs which are never quite absent from the leaves (the leaves are quite glabrous or at least scabrid or white-punctate in *K. zeyheri* and other related species).
3. The size of the flowers (which are larger than those of some related monoecious species) which are, in addition, racemes or fascicled, not subumbellate as in e.g. *K. africana*.

3. *K. nana* (Lam.) Cogn., aggregate species.

This is a complex separable into three varieties:

- Leaves broadly ovate to reniform-cordate, entire or angular to lobed (but not beyond the middle); lobes broad, obtuse, rarely acute, entire or rarely dentate or faintly 3-lobed. var. *nana*
 Leaves deeply palmatilobed to palmatisect; lobes usually acute, often dentate, lobulate or dissected, or lobes narrow, ligulate, rounded:
 Leaves usually smooth above (rarely white-punctate-scabrid); segments of leaves usually more or less rhomboid or cuneate, often coarsely and acutely dentate. var. *zeyheri*
 Leaves usually scabrid on upper or on both surfaces with white pustules; segments of leaves variable, usually more or less ligulate, sometimes again lobed with ligulate lobes var. *schlechteri*

(a) *K. nana* (Lam.) Cogn. var. *nana*.

Bryonia nana Lam., Encycl. 1: 497 (1783). *B. triloba* Thunb. Prodr. Pl. Cap. 13 (1794), non Lour. (1790). *B. africana* Thunb., l.c., non L. *Bangulata* Thunb. *Kedrostis mollis* (Kunze) Cogn., Mon. Cucurb. 637 (1881). *K. velutina* Cogn. in Vjschr. Naturf. Ges. Zurich. 53: 492 (1908); Pflanzenreich, 143 (1916). *K. angulata* (Berg.) Fourcade in Trans. Roy. Soc. S. Afr. 21: 91 (1932), nomen illeg. *Sicyos angulata* Berg., Descr. Pl. Cap. 352 (1767), non L. (1753). *Cyrtanema triloba* (Thunb.) Schrad. apud Eckl. & Zeyh., Enum. 276 (1834); Linnaea 12: 403, 404 (1838). *C. molle* Kunze in Linnaea 20: 49 (1847). *Zehneria hederacea* Sond. in Fl. Cap. 2: 487 (1862). *Coniandra thunbergii* Sond., l.c. 484. *C. molle* (Kunze) Sond., l.c. 485 (1862). *Melothria hederacea* (Sond.) Cogn., Mon. Cucurb. 611 (1881); Pflanzenreich 107 (1916).

Type: A sterile specimen in Herb. Lamarck (P), grown in the botanical gardens of Paris. Mr. W. Marais kindly compared the type and reported that although the specimen is sterile, it undoubtedly agrees with the general conception of *K. nana*.

Foetid perennial with thick tuberous roots and long slender climbing or more rarely prostrate stems, varying from nearly glabrous to more or less densely and shortly pubescent. *Stems* slender, longitudinally sulcate, usually much branched and usually thinly hairy when young, glabrescent. *Leaves* fleshy drying subcoriaceous rarely thinner in texture, in outline cordate-reniform or suborbicular-cordate, usually distinctly angular sometimes somewhat lobed, rarely as far as the middle, deep green when alive but usually drying greyish green (often paler and more greyish on lower surface) 2–7 cm long and broad with a shallow rounded to subtruncate, occasionally broadly triangular basal sinus, an obtuse or rounded rarely acute, sometimes mucronate apex and lobes and a subentire to crenulate or somewhat crenate-dentate margin; petioles 1–4 cm long, usually rather slender. *Male plants*: flowers racemose; common peduncle slender to filiform, up to about 20-flowered, almost invariably shortly and sparingly pubescent, 2–10 cm long; pedicels erect-patent, filiform to capillary, 3–16 mm long, often with minute bracts at the base; receptacle narrowly campanulate to subcylindric 2–4 mm long, 1–3 mm wide, usually more or less hairy; sepals narrowly triangular, erect, 1–2 mm long; petals light yellow, ovate-oblong or ovate-triangular, subacute, densely papillose-puberulous on the outside 4–9 mm long. *Female plants*: flowers solitary, on a filiform peduncle up to 8 mm long in fruit; ovary oblong-fusiform, more or less beaked, sometimes distinctly but finely longitudinally striate. *Fruit* ovoid, conical-acute to rostrate, orange to red, smooth and glabrous when ripe, few-seeded, 1.5–2 cm long, about 8 mm in diam. *Seeds* smooth, 6–7 mm long, 3–4 mm broad and 2–3 mm thick.

A rather variable taxon, described under several names, varying from almost completely glabrous to rather densely hairy and varying in the leaf-shape. The identity of various synonyms was established by studying authentic specimens (or photographs of these), as indicated under cited specimens.

CAPE PROVINCE.—Cape Peninsula: *Bolus* 4015 (BOL); *Compton* 21860 (NBG); *Williamson* 23 (GRA); near Cape Town, *Rehmann* 1548 (BR, L); Camp's Bay, *A Prior* s.n. (PRE); *Galpin* 27 (GRA, PRE); *Esterhuysen* 12777 (PRE); *Barker* 5582 (NBG); Llandudno, *Compton* 8892 (NBG); Houtbay, *Compton* 13229 (NBG); Table Mountain, Stinkwater Gorge, *Moss* 7443 (J); Muizenberg, *MacOwan* 3107 (NBG); *Eyles* 6503 (SRGH); *Brain* 5884; 6049; *Meebold* 11867 (M); *Esterhuysen* 12848 (BOL). Slangkop Station, *Marloth* 11941; East Head, *Williamson* 14 (GRA); near Simonstown, *Wolley Dod* 1176 (BOL); *Rodin* 3293 (BOL, PRE); Lion's Head, *Wolley Dod* 2325 (BOL); near Ronde Vlei, *Leipoldt* 4153. Stellenbosch: *Kräusel* 474 (M). Caledon: Onrust Rivier, *van der Riet* in Hb. Marloth 11941 (PRE); *van Niekerk* 337 (BOL); *Esterhuysen* Hb. no. 25604 (BOL); Kleinmond, *de Vos* 387 (BOL); Hermanus, *Burt*

Davy 18493 (PRE). Bredasdorp: Melkbosch, *Lotsy & Goddijn* 1689 (L); Brandfontein, *Schlechter* 10579 (BOL). Riversdale: *Muir* s.n., 105 in Hb. Galpin 5201 (PRE). Mossel Bay: Mossel Bay, *Taylor* 1114; 1115; 1116 (PRE). George: Kaaimans River, *Wilman* Hb. no. 25159 (BOL, PRE); Wilderness, *Compton* 10648 (NBG). "George-Knysna": *Martin* 4423; 4458. Knysna: *Breyer* TRV no. 23694 (PRE); *Keet* 700 (GRA, PRE); *Taylor* 1154; 1335. Humansdorp: Krom River, *Drege* 8186 (type of *Zehneria hederaceae* Sond.). (S, holo., photo. PRE, L, iso.); Groot Rivier Forest, *Steyn* 736 (NBG). Humansdorp: *Fourcade* 1193 (NBG). Uitenhage: Zwartkopsrivier, *Ecklon & Zeyher* 1781 (NBG); *Zeyher* 2480 (iso.! of *Kedrostis mollis* in NBG); Port Elizabeth: Humewood, *Paterson* 589 (BOL, GRA); Port Elizabeth, *I. L. Drege* s.n. (GRA). Alexandria: Olifantshoek, *Ecklon & Zeyher* (NBG). Bathurst: Port Alfred, *Salisbury* 12 (NBG); Fish River Mouth, *Davies* s.n. (GRA). Komgha: Kei Mouth, *Flanagan* 609 (NBG, PRE). Cape, without precise locality: *Thunberg* (holotypes of *Bryonia angulata* Thunb., *B. africana* Thunb., non L. and *B. triloba* Thunb. in UPS, photo. in PRE!). NATAL.—Eshowe: *Lawn* 2263 (NH).

(b) *K. nana* (Lam.) Cogn. var. *zeyheri* (Schrad.) *A. Meeuse*, stat. nov.

Coniandra zeyheri Schrad. apud E. & Z., Enum. Pl. Cap. 275 (1834); *Linnaea* 12: 403 (1838); Sond. in Fl. Cap. 2: 485 (1862), incl. var. *angustiloba* Sond. *Cyrtanema sphenoloba* Schrad., op. cit., 276 (1834); 403 (1838). *Kedrostis zeyheri* (Schrad.) Cogn., Mon. Cucurb. 641 (1881); Pflanzenreich 147 (1916), incl. var. *angustiloba* (Sond.) Cogn., op. cit. 642 (1881); 148 (1916). *K. digitata* (Thunb.) Cogn. sensu Cogn., Mon. Cucurb. 639 (1881) and in Pflanzenreich 146 (1916), ex parte, incl. var. *major* Cogn., op. cit. 640 (1881); 147 (1916).

Type: *Ecklon & Zeyher* 1775 (L, NBG, iso!).

Differs from *K. nana* var. *nana* only in the shape of the leaves, which are dissected beyond the middle with rhomboid to oblong-cuneiform, often 3-lobed acute or obtuse lobes and are usually glabrous.

CAPE PROVINCE.—Worcester: Hex River Mts., *Lam & Meeuse* 4569 (L). Prince Albert: *Bolus* 10463 (BOL). Uitenhage: Zwartkopsrivier, *Ecklon & Zeyher* 280 (BOL, NBG); *Zeyher* 1775 (L, NBG); 2472 (NBG); Enon, *Thode* A1104 (NH); Addo, *Ecklon & Zeyher* 761 (BOL, NBG). Port Elizabeth: Redhouse, *Paterson* 229 (GRA); 526 (GRA, BOL); 626 (GRA); Humewood, *Johns* s.n. (NBG); Alexandria: Coega, *Rogers* 113 (GRA); 4 miles S. of Zuurberg Hotel, *Story* 2302 (PRE); Boschmans River, *Ecklon & Zeyher* 845 (NBG); *Zeyher* 2471 (NBG). Bathurst; Kariega River, *Acocks* 18331; 18331A; 18355 (PRE). Albany: Howieson's Poort, *Britten* 2867 (GRA); Pluto's Valley, *Dyer* 1835 (GRA, PRE). Fort Beaufort: near Fort Beaufort, *Story* 2214 (PRE). King William's Town: *Sim* 20234b (PRE). East London: *Galpin* 3181 (GRA, PRE). Kentani: *Pegler* 477 (PRE).

NATAL.—Camperdown: *Franks* in Hb. Wood 11682 (NH). Eshowe: *Lawn* 552 (NH). Lower Umfulosi: near Empangeni, *Lawn* 2173 (NH); Umhlatuzi Valley, *Lawn* 2206 (NH). Hlabisa: *Ward* 1658 (NH). Ingwavuma: Ndumu Game Reserve, *Ward* 3167 (PRE).

(c) *K. nana* (Lam.) Cogn. var. *schlechteri* (Cogn.) *A. Meeuse*, stat. nov.

K. schlechteri Cogn. in Bull. Herb. Boiss. 2me. sér. 6: 829 (1906); Pflanzenreich 148 (1916). *K. digitata* (Thunb.) Cogn. Mon. Cucurb. 639 (1881) and in Pflanzenreich 146 (1916), ex parte.

Bryonia digitata Thunb., Prodr. Pl. Cap. 13 (1794).

Type: *Schlechter* 6053 from Gamtoos River (Z, holo.!; PRE, photo, BOL, GRA, iso!).

Differs from the other two varieties in the usually deeply dissected leaves with narrow (ligulate) lobes or ultimate lobes; upper or both surfaces of the leaves with distinct white pustules, rarely without.

CAPE PROVINCE.—Riversdale: *Muir* 2160 (PRE). Humansdorp or Port Elizabeth: Gamtoos River, *Schlechter* 6053. Uitenhage or Port Elizabeth: “Koegea River and Karroid ground, Winterhoeksberge”, *Ecklon & Zeyher* 79.2 (PRE). Port Elizabeth: Addo Game Reserve. *Brynard* 427 (PRE); 36 miles from P.E. on Steytlerville Road, Long 1210 (GRA, PRE). Alexandria: *Archibald* 7360 (PRE).

The three varieties as defined here are not sharply separable, but the extremes are so different in habit that I hesitate to unite them all. Culture experiments with seeds of all forms grown side by side may clear up their relationships. There is certainly some relation between the distribution (ecology) and the morphology of the three forms, var. *schlechteri* occurring in the driest regions, var. *nana* in the coolest and dampest, whereas var. *zeyheri* is more or less intermediate in this respect. The holotype of *K. nana* is in the Lamarck herbarium (P) and was seen by Mr. W. Marais who reported that, although it consists of sterile pieces, it undoubtedly represents *K. nana* as understood by Cogniaux and others (here called var. *nana*). *K. mollis* is merely a hairy form (isotype, *Zeyher* 2489 in NBG, SAM), as is *K. velutina* Cogn. (*Schlechter* 2596 in Z!, holo.).

The specimen *Drege* 8186 on which Sonder based his *Zehneria hederacea* (S, holo.! L, iso.!) is rather “typical” *K. nana* var. *nana*. Cogniaux transferred it to *Melothria*, I do not know on what grounds, but presumably because he never saw the type and transferred it “automatically” from *Zehneria* to *Melothria*. Thunberg collected the var. *nana* several times and described it as *Bryonia africana* (non L.), *B. angulata* and *B. triloba*. *B. angulata* was placed by Cogniaux (1881, 1916) as a synonym of “*Melothria punctata*” (= *M. cordata*, see p. 19) but here again he did not study the type which is clearly *Kedrostis nana* var. *nana*. *Bryonia digitata* Thunb. is represented in his herbarium by a poor specimen which is most probably the same as *Kedrostis schlechteri* Cogn. *Coniandra digitata* Sond. and *Kedrostis digitata* Cogn. are nomenclaturally based on Thunberg’s name, but as far as I can see both Sonder and Cogniaux included mostly specimens which are actually *K. capensis* (= *Pisosperma capense* Sond.) and perhaps some which are *K. africana*, so that the name is somewhat confused. For these reasons I do not take up *digitata* as the epithet for the variety of *nana* to which I refer Thunberg’s *Bryonia digitata*, but the unambiguous epithet *schlechteri*.

4. *K. africana* (L.) Cogn., Mon. Cucurb. 643 (1881); Pflanzenreich 275.1: 149 (1916); Dinter in Fedde, Repert. 18: 434 (1922); Burt Davy Fl. Transv. 1: 226 (1926).

Bryonia africana L., Sp. Pl. ed. 1: 1013 (1753). *B. dissecta* Thunb., Prodr. Pl. Cap. 13 (1794); Fl. Cap. 154 (1811); Fl. Cap. ed. Schultes 36 (1823); Ser. in DC., Prodr. 3: 308 (1828). *B. digitata* Thunb., op. cit. 13 (1794); 154 (1811); 35 (1823); Ser., op. cit. 309. *B. pinnatifida* Burch., Trav. S. Afr. 547 (1822); Ser., op. cit., 308. *B. grossulariaefolia* E. Mey. ex Drege, Zw. Pflgeog. Doc. 132, 169 (1843), nomen tantum. *B. multifida* E. Mey. ex Drege, op. cit., 54, 147, 149, 169, nomen tantum. *Coniandra grossulariaefolia* E. Mey. ex Arnott in Hook., Journ. Bot. 3: 273 (1841). *C. glauca* Schrad. apud E. & Z., Enum. Pl. Cap. 277 (1834); Linnaea 12: 403 (1838). *C. dissecta* (Thunb.) Schrad., *C. pinnatisecta* Schrad. apud E. & Z., op. cit., 276. *C. africana* (L.) Sond., *C. digitata* (Thunb.) Sond., Fl. Cap. 2: 483 (1862). *C. punctulata* Sond., op. cit., 484.

Kedrostis digitata (Thunb.) Cogn., op. cit. 639 (1881); 146 (1916). *K. glauca* (Schrad.) Cogn., op. cit., 640 (1881); 147 (1916). *K. punctulata* (Sond.) Cogn., op. cit. 642 (1881); 148 (1916); Burt Davy, l.c.

Type: Linnaeus originally based this species on "*Bryonia africana laciniata, tuberosa radice, floribus luteis*" (Linnaeus, in 1753, cited erroneously "herbaceis" instead of "luteis"), Herm. Parad. Bot. 107 (1698) and t. "108" (recte: t. 23, see below). In addition, Linnaeus cited "Hort. Cliff. 453".

Herman cites under the plate cited by Linnaeus "*Bryonia africana glabra foliis profunde sectis, teruiroribus*" (sic!). This plate is the 23rd and should be cited as "t. 23" but, as is done in many contemporary works, the relevant text page is also indicated, which in this case is "108". However, there is no reference to a *Bryonia africana glabra* on this page 108, and this phrase name does not occur anywhere in the text. The phrase name cited by Linnaeus and subsequent authors, viz., "*Bryonia africana laciniata*, etc." is not found on any of the other plates in the book. Linnaeus assumed that the plate belongs to the text on p. 107 (and not on p. 108 as indicated on t. 23), and this is most probably what Herman intended. Plate 22 of Herman's publication refers to p. 107, but this plate represents a plant from Ceylon and is the basis of *Bryonia laciniosa* L., which is now generally accepted to be *Bryonopsis laciniosa* (L.) Naud., which does not occur in Southern Africa. For nomenclatural purposes, at any rate, t. 23 (= t. "108") is the basis of *Bryonia africana* L.

In the second edition of Species Plantarum (p. 1013) Linnaeus cites "*Bryonia africana laciniata* . . . herbaceis" again, repeating the error in the first edition. Willdenow, in his edition of the Species Plantarum 4: 624 (1805), cites the same phrase under "*Bryonia africana*" but this is *B. africana* Thunb. non L. (= *Kedrostis nana*) so that this citation is absurd, because the cited plate does not agree in the least with Thunberg's description of *B. africana* (non L.) as having angular 5-lobed leaves and, in addition, because "*B. (africana)*, Sp. Pl. 1438" is cited by Willdenow under *Bryonia dissecta* Thunb. [= *K. africana* (L.)] Cogn.: and the Herman reference belongs to the Linnaean *B. africana*, not to Thunberg's.

Herbaceous climber, occasionally prostrate. *Rootstock* tuberous, perennial. *Stems* annual, slender, angular or angular-sulcate; glabrous or nearly so, much branched, up to 6 m long but usually considerably shorter. *Leaves* sessile to shortly petioled, herbaceous drying membranous or occasionally thicker or tougher to slightly coriaceous, glabrous and smooth to scabrid-punctulate mainly on upper surface, sometimes scabrid with distinct white scaly dots, orbicular, cordate or triangular in outline, varying from deeply pinnately or digitately dissected to occasionally (and also the first leaves formed) only pinnately or palmately lobed, 2–10 cm in diam.: the segments varying from narrow, filiform to lanceolate or elliptic or somewhat obovate to cuneiform; the ultimate lobes filiform to rather wide (up to 12 mm broad), acute, acuminate, obtuse or rounded, usually mucronate, entire or occasionally dentate the margins flat (in the thin, herbaceous leaves) or more or less recurved (in the firmer leaves which are usually also more punctate-scabrid); petioles slender, sulcate, glabrous or slightly pilose, 1–12 mm long. *Tendrils* simple, slender, glabrous. *Flowers* monoecious, minute, with a yellowish green, whitish or cream-coloured corolla, almost invariably the subumbellately racemose flowers in the same axils as the sessile or subsessile and solitary or occasionally fasciated female flowers. *Male flowers*: common peduncle filiform, glabrous, finely striate, few- to 12-flowered, 2–8 cm long; pedicels capillary, usually patent or erecto-patent, 2–5 mm long, usually with minute (0.5–1 mm long) bracts at the base; receptacle 0.5–1.5 mm long and 1–2 mm in diam., sepals narrowly triangular to linear or subulate, 1–2 mm long; petals finely papillose, 1–2 mm long. *Female flowers*: peduncles (even in fruit) not exceeding 6 mm; ovary subglobose or ovoid, constricted to shortly rostrate at the apex, glabrous. *Fruit* subglobose, often shortly and abruptly pointed, red when ripe, glabrous, few-seeded, 8–15 mm in diam. *Seeds* ovoid-oblong or ovoid, somewhat attenuate and truncate at the end; finally granulated, 4.5–6 mm long, 3.5–4.5 mm wide and 2.5–3 mm thick.

Recorded from the following districts: *South West Africa*: Rehoboth, Maltahöhe, Lüderitzbucht, Bethanien, Keetmanshoop, Warmbad; *Cape Province*: Vryburg, Kuruman, Barkly West, Hay, Kimberley, Herbert, Colesberg, Murraysburg, Graaff-Reinet, Beaufort West, Laingsburg, Prince Albert, Swellendam, Uniondale, Uitenhage, Port Elizabeth, Albert, Cradock, Queenstown, Fort Beaufort, Cathcart, Albany, Bathurst, Komgha, Umtata; *Natal*: Utrecht, Weenen, Estcourt, Pietermaritzburg, Camperdown; *Orange Free State*: Kroonstad, Boshoff, Senekal, Bloemfontein, Fauresmith, Ladybrand; *Transvaal*: Rustenburg, Marico, Potchefstroom, Krugersdorp, Brits, Pretoria, Lydenburg.

The following specimens are of special interest: *Zeyher* 603 (NH, PRE), cited by Sonder as *Coniandra punctulata*, by Cogniaux as *K. punctulata*, locality not certain (Sonder in Fl. Cap. and Cogniaux cite different localities, but both seem to be in Bushmanland); *Zeyher* 602 (SAM) and *Burke* s.n. (PRE), from Rhenosterkop Beaufort West, also cited by Sonder and by Cogniaux as *C. (K.) punctulata*; *Zeyher* 600 (PRE) and *Burke* 288 (SAM), from Mooi River, Potchefstroom, Transvaal, cited by Cogniaux and by Burt Davy as *K. africana*; *Zeyher* 600 cited by Sonder as *C. africana*; *Burke* 287 from the Sneeuwberg, probably collected in Graaff-Reinet (PRE), and *Ecklon & Zeyher* 1776 from the Gauritz River, Swellendam (SAM) and 1778 from same locality (M), cited by Sonder and by Cogniaux as *C. (K.) africana*; *Ecklon & Zeyher* 1777 (SAM), probably from Uitenhage, cited by Sonder as *C. glauca* var. *dissecta* and by Cogniaux as *K. glauca* var. *dissecta* (this is probably the basis of *Coniandra dissecta* Schrad., see below); *Ecklon & Zeyher* 1774 from Couga, Winterhoeksberge, Uitenhage, isotype of *C. glauca* Schrad. (SAM); *Drege* 8188a and 8189 from Beaufort West (L), both cited by Cogniaux as *K. punctulata* (*Drege* 8189 cited by Sonder as *C. punctulata*, *Drege* "8188" is cited by Sonder as probably being *C. glauca*); *Rehmann* 4193 (BOL, GRA) and 4708 (BR, L), from Pretoria, cited by Cogniaux (1916) and by Burt Davy as *K. africana*; *Bolus* 146 from Graaff-Reinet (BOL, GRA, SAM), cited by Cogniaux under *K. africana*; *Flanagan* 1412 from Kimberley (BOL, PRE), erroneously cited as "no. 3650" by Cogniaux under *K. punctulata* ("3650" is the altitude in feet!); *Galpin* 2134 from Queenstown (BOL, PRE) cited by Cogniaux as *K. africana*; *Schlechter* 2528 from Uitenhage (BOL, COI, GRA, J, Z), cited by Cogniaux (1916) as *K. punctulata*; *Dinter* 2686 from the Schaaprivier (SAM), cited (1916) as *K. africana*; *Dinter* 2249 from Rehoboth-Aus (SAM) cited (1916) as *K. punctulata*; *Dinter* 1158 from Jakallskuppe, Lüderitzbucht, and *Dinter* 1905 from Schaaprivier (probably Rehoboth distr.) both in PRE and SAM, cited by Cogniaux (1916) as *K. punctulata* var. *tenuiloba* (Sond.) Cogn.; *Leendertz* 464 from Pretoria (L, PRE) cited by Burt Davy as *K. africana*; *Schlechter* 6145 from Gonubi River, East London (GRA), erroneously referred to *K. zeyheri* var. *angustifolia* by Cogniaux (1916).

The various described species lumped here are only forms of one variable species. The variation in leaf shape and the presence or absence of the white scabrid scale-like dots on the vegetative parts account for the considerable synonymy. Young plants form undivided to palmatilobed or palmately dissected leaves which occasionally persist in older plants, and such specimens have been described as *Bryonia digitata* Thunb. and *Coniandra glauca* Schrad. The forms with pinnatisect leaves occur in two different types, one with narrow leaf-segments with recurved margins which sometimes appear almost filiform and are often also distinctly white-punctate (described as *Coniandra punctulata* Sond.; specimens with very narrow leaf segments as var. *tenuiloba* Sond.); and one with flat, broader, more herbaceous and usually less white-punctate segments which is *Coniandra africana* as understood by Sonder, and *K. africana* sensu Cogniaux. There are many intermediates, however.

The latest monographer of the genus (Cogniaux) obviously had some difficulty in separating some of the four "species" he upheld (but which are reduced to one here), because the gathering *Ecklon & Zeyher* 1777 appears in his treatments of 1881

and 1916 as "*K. glauca* var. *B. dissecta* (Sond.) Cogn.", but this is certainly wrongly cited, for the varietal name is based on *Coniandra glauca* var. *dissecta* Sond. in Fl. Cap. 2: 484, and Sonder cites "*C. dissecta* Schrad." (apud E. & Z., Enum. Pl. Cap. 276) as a synonym. Schrader and Sonder both cite "Ecklon & Zeyher 1777" under the name "*dissecta*" but the latter author and Cogniaux apparently overlooked the fact that Schrader cited *Bryonia dissecta* Thunb. as a synonym of his *Coniandra dissecta*, so that he actually made a new combination. Now both Sonder and Cogniaux cite *Bryonia dissecta* Thunb. as a synonym of *K. africana*, but the Ecklon & Zeyher gathering appears in their publications as a var. *dissecta* of *K. glauca*. Such inconsistencies are easily explained if one accepts the synonymy as indicated in the present paper.

5. *Kedrostis crassirostrata* Bremek. in Ann. Transv. Mus. 15, p. 260 (1933).

Type: *Bremekamp & Schweickerdt* 40 in PRE (holo!).

Most probably perennial with an underground tuberous rootstock, glabrous in all vegetative parts or nearly so. *Stems* annual, climbing, herbaceous, up to about 2 m long, slender, geniculate at the nodes, sulcate; internodes usually 4–5 cm long. *Leaves* subsessile, somewhat fleshy drying thin and papery, the lamina suborbicular in outline, white-punctate above, smooth below, 2–7 cm in diam., digitately 3–5-lobed with pinnatifid segments; the ultimate lobes oblong to linear, mucronate, with the margin usually more or less reflexed below, up to 25 mm long and 0.5–2 mm, rarely 3 mm wide. *Male flowers* subumbellately racemose; common peduncle rather stout, up to about 5 mm long, usually ebracteolate at the base, articulate at the apex; receptacle widely campanulate, glabrous, about 1 mm long and 2 mm in diam.; sepals patent, triangular-subulate or lanceolate, usually a little longer than the receptacle, very acute; petals ovate or oblong, acute, about 1.5 mm long, papillose-hairy on the back. *Female flowers* solitary in the same axils as the males, subsessile; ovary from a lageniform or ellipsoid basal portion long-rostrate, densely papillose-hairy, about 4 mm long; calyx and corolla as in the male. *Fruit* on an incrassate up to 2.5 mm long peduncle, ovoid-lageniform or obpyriform, rounded at the base, glabrous and red when ripe, rostrate with a conical acute or obtuse rostrum, with longitudinal faint ribs, 1–5 seeded, 15–25 mm long (of which a little less than half is taken up by the rostrum) and 8–15 mm in diam. *Seeds* brown, broadly ellipsoid with a slightly attenuate and truncate base, very slightly rugose, laterally margined, 4–5 mm long.

SOUTH WEST AFRICA.—Gobabis: Sandfontein, *Bleek* Hb. No. 26241 (SAM); *Wilman* Hb. No. 26701 (SAM); Babi-babi: *Wilman* Hb. No. 3085 in (KMG) = Hb. No. 15300 (BOL).

CAPE PROVINCE.—Vryburg: Palmyra, 60 miles N.W. of Vryburg, *Rodin* 3535 (BOL, PRE); near Vryburg, *Barkhuizen* 100 (PRE). Taungs: Home Rule, *Brueckner* 596 (KMG, PRE); Vryburg: *Henrici* 48 (PRE); Tipperary, *Brueckner* 1090 (KMG, PRE); Dry Harts, *Mogg* 8961 (PRE). Barkly West: Waldeck's Plant, *Acocks* 1443 (KMG, PRE).

TRANSVAAL.—Pietersburg: Brak River, *Bremekamp & Schweickerdt* 40 (PRE, holo!). Potgietersrust: Roedtan, *Meeuse* 9605 (PRE). Pretoria: near Pienaars River, *Codd* 818 (PRE); *Gomes Pedro* 710. Bloemhof: Kameelpan, *Christiana*, *Theron* 3471 (PRE).

BECHUANALAND PROTECTORATE.—Mochudi, *Rogers* 6361 (BOL, PRE).

This species occurs in dry sandy areas (Kalahari sand). As was already pointed out by Bremekamp, this species is closely related to *K. africana* and "*K. punctulata*" (= *africana*), but is quite distinct by its short male peduncles and long-rostrate fruits.

6. *K. natalensis* (Hook. f.) A. Meeuse, comb. nov.

Toxanthera natalensis Hook. f. in Hook., Icon. Pl. 15: 17, t. 1421 (1883); Cogn. in Pflanzenreich 275.1: 137 (1916). *T. lugardae* N. E. Br. in Kew Bull. 1909: 112 (1909); Cogn. in Pflanzenreich 275.1: 138 (1916). *T. kwebensis* N.E. Br., op. cit., 113; Cogn., op cit., 137.

Kedrostis longipedunculata Cogn. in Bull. Herb. Boiss. 3: 421 (1895). *K. rautanenii* Cogn. in Viertelschr. Naturf. Ges. Zürich 55: 247 (1910); Pflanzenreich 275.1: 150 (1916). *K. gilgiana* Cogn., op. cit. fig. 35, 151 (1916). *K. eminens* Dinter & Gilg. ex Cogn., op. cit. fig. 36, 152 (1916). *K. otaviensis* Dinter, Sukkulentenf. S.W. Afr. 2 (in Fedde, Repert., Beih. 53): 116 (1928), nomen subnudum.

Type: Hooker mentioned two gatherings, viz. *Gerrard* 1192 (excl. fruit) and *Wood* 813. The accompanying plate shows a fruit and seeds which of course could not have belonged to *Gerrard* 1192, so that *Wood* 813 (K ex Herb. Hook.) is proposed here as the lectotype.

Perennial. *Rootstock* tuberous, ovoid, to fusiform up to 20 cm long and 10 cm thick (in very old specimens probably larger). *Stems* several from the crown of the root, herbaceous, subterete, longitudinally striate, more or less thinly hairy (the pubescence varying from shortly scabrid-pilose to setulose, shortly hirsute or puberulous), prostrate and up to 1.50 m long or climbing and attaining to several meters in length. *Tendrils* usually bifurcate above a short simple portion, or some or occasionally all of them simple, often elongate, thinly hairy as are the stems. *Leaves* herbaceous, dark green above, lighter beneath, broadly cordate-suborbicular or orbicular-subreniform in outline, varying from faintly 5-lobed to 5-sect to below the middle, more or less hairy above usually thinly so, thinly to densely hairy below, 3–16 cm long and wide; the margin faintly to rather coarsely sinuoso-dentate, the teeth usually acute to setulose; the veins often prominent below forming a coarse network; the lobes varying from triangular to ovate, obovate, broadly elliptic, oblong or lanceolate with the basal ones always tending to be falcate in deeply dissected leaves, acute to apiculate; basal sinus usually deep and subrectangular, less often broadly rounded; petioles subterete, hairy as are the stems, 15–10 cm long. *Flowers* monoecious, male and female ones produced in the same or in different axils; receptacle semiglobose, broadly campanulate or broadly obconical, shortly pubescent to hirtellous as are the peduncles, bracteoles, pedicels and sepals, 2–4 mm high and as wide; sepals patent to erect, triangular-subulate to linear-lanceolate or occasionally triangular-ovate, usually longer than the receptacle; corolla pale yellow to somewhat greenish pale yellow, usually shortly pubescent, usually shortly exceeding the sepals, more or less triangular-ovate usually subacute to obtuse. *Male flowers* subumbellately racemose; common peduncle varying from 1 cm (prostrate specimens) to 18 cm long (in climbing ones under favourable conditions), usually 2–7 cm long; pedicels slender, hairy, usually patent, 2–12 mm long; bracteoles subulate, deciduous. *Female flowers* solitary; pedicels 0.5–4 cm long, rarely longer; ovary narrowly oblong, linear or fusiform, glabrous or more or less hairy, usually about 2 cm long; staminodes 0–5, small; style columnar, stigmas 2, at first cohering into an erect digitiform structure, later separating and often reflexed with truncate to flabelliform tips. *Fruit* narrowly ellipsoid with long rostrate apex, linear-fusiform or fusiform, smooth, red and glabrous when ripe, 4–9 cm long and 1.5–2 cm in diam. *Seeds* rather numerous, broadly ellipsoid-subglobose, 4–6 mm long and 4–5 mm in diam.

SOUTH WEST AFRICA.—Ovamboland: Omakunde, *Rautanen* 703 (Z, type of *K. rautanenii* Gilg). Okavango: Sambiu Camp, *de Winter* 4019 (PRE). Grootfontein: Gautscha Pan, *Story* 6229 (PRE); Otavi, *Dinter* 5316 (B, PRE), 5524, 5548 (B). Okahandja: Eahero, *Dinter* 3280 (SAM); Osona: *Dinter* 62 (isotype of *K. gilgiana* Cogn., PRE, SAM). Windhoek: Leutwein, *Dinter* s.n. (B).

BECHUANALAND PROTECTORATE.—Mochudi, *Rogers* 6393 (BOL).

CAPE PROVINCE.—Mafeking, *v.d. Merwe* 20 (BOL). Vryburg, *Mogg* 8961 (PRE). Hay: Postmasburg, *Lewis* 5354 (SAM); Asbestos Hills, *Esterhuysen* 806 (BOL, KMG, PRE); Dunmurry, *Wilman* (BOL, Hb. No. 256013, KMG, H. No. 2371); Niekerk's Hope, *Wilman* 1410 (KMG). Barkly West: near "Border", *Acocks* 1891 (KMG). Komgha, *Flanagan* 641 (BOL, SAM). Kentani: *Pegler* 1280 (BOL, GRA, PRE, SAM). Umzimkulu: Clydesdale, *Tyson* 2558 (BOL, SAM).

TRANSVAAL.—Rustenburg: 15 miles E.S.E. of Rustenburg, *Leistner* 533 (PRE); 12 miles S. of Zwartuggens, *Codd* 2662 (PRE). Krugersdorp: Witpoortjie, *Mottley* 2385; *Moss* 16189 (J). Pretoria: Groenkloof, *Mogg* 14214 (PRE); Bon Accord, Pyramid Hills, *v. Niekerk & Wasserfall* 32 (PRE, SRGH); de Wildt, *Murray* 512 (PRE). Brits: Farm Welgevonden, *Mogg* 14632 (PRE); Crocodile Drift, *Obermeyer* in T.M. 35159 (PRE, NH). Carolina: Waterval Boven, *Rogers* 14291 (Z). Lydenburg: Ohrigstad, *Young* A 579 (PRE). Belfast: Schoemans Kloof, *Pole Evans* 3930 (PRE); *Young* A 295 (PRE). Nelspruit: Ship Mountain, *van der Schijff* 1656 (PRE). Barberton: *Pott* 5447 (PRE); Hislops Creek, *Thornicroft* 862 (NH). Letaba: Ofcolaco, *Story* 5403 (PRE). Soutpansberg: Messina, *Moss & Rogers* 5050 p.p. (J). Sibasa: Pafuri, *van der Schijff* 4096; 4174.

NATAL.—Ndwedwe: *Wood* 7520 (BOL, PRE, L). Camperdown: between Drummond and Inchanga, *Eshuis* s.n. (PRE). Verulam: "Umhloti and Inanda", *Wood* 813 (NH, isotype!). Inanda: *Wood* 8409 (type of *K. longipedunculata* Cogn., Z). Durban: *Wood* 8540 (NH); Sarnia, *Mariott* in NH 26174 (NH).

SOUTHERN RHODESIA.—Bulalima-Mangwe: Embakwe, *Feiertag* Hb. No. 45475; 45480 (SRGH). Bulawayo: *Eyles & Johnstone* 51 (GRA); *Kolbe* 4165 (BOL). Wankie: *Rogers* 5829 (BOL). Chipinga: Birchenough Bridge, *Obermeyer* 2506 (PRE).

A study of the available material, including living specimens cultivated from seeds or tubers in Pretoria, and of most of the types, necessitates the reduction of many described species to *Toxanthera natalensis*, the oldest name available, which at the same time must be transferred to *Kedrostis*. Slight differences in habit, size and shape of leaves, length of peduncles, etc., are easily explained by the variation of the ecological conditions in the large area of distribution. Some species were described as having a single digitiform stigma and others as having two reflexed flabelliform stigmas, but this is merely a matter of age: the two stigmas are erect and cohering in young flowers but later separate and become reflexed. The number of staminodes varies from 0 to 5 which probably explains the fact that Cogniaux and N. E. Brown described some forms with 5 staminodes under *Toxanthera* and others (with 0-3 staminodes) under *Kedrostis*. The seeds are white or whitish and N. E. Brown's statement that the seeds of *Toxanthera lugardae* are scarlet must be erroneous; most probably the red fruit pulp adheres to the seeds or has stained them red.

The known area of distribution suggests that the species extends even further north and some species described from West- and East Africa such as *Kedrostis ledermannii* and *K. rigidiuscula* are possibly identical. This would extend the range considerably.

The actual type specimen of *Kedrostis eminens* was not available for study (only fig. 35 in Cogniaux's 1916 Monograph), but *Dinter* himself added this name to his no. 62 (described as *K. gilgiana* by Cogniaux) and to his number 5316. On his sheets in the Berlin herbarium *Dinter* wrote that *Toxanthera kwebensis* and *K. eminens* are most probably identical. It seems fairly safe to reduce *K. eminens* to a synonym of *K. natalensis*. *K. otaviensis* *Dinter*, which was published without a proper description, is another synonym, because *Dinter* mentioned that he collected this plant under the number 5524, a sheet of which is represented in Berlin and proved to belong here.

EXCLUDED SPECIES

- K. bainesii* (Hook. f.) Cogn. (*Rhynchocharpa bainesii* Hook. f.) = *Corallocarpus bainesii* (Hook. f.) A. Meeuse, see p. 41.
- K. cinerea* Cogn. in Bull. Herb. Boiss. 2me. sér., 1: 883 (1901) = *Melothria cinerea* (Cogn.) A. Meeuse, see p. 17.

7. CORALLOCARPUS

Corallocarpus *Welw. ex Benth. & Hook. f.*, Gen. Pl. 1: 831 (1867); Trans. Linn. Soc. 27: 32 (1869); Hook. f. in Fl. Trop. Afr. 2: 565 (1871); Cogn., Mon. Cucurb. 645 (1881); Pflanzenreich 275.1: 156 (1916); Pax in Pflanzenfam. 4, 5: 18 (1889); Phillips, Gen. ed. 2: 747 (1951).

Perennials with usually tuberous rootstock forming annual herbaceous scandent or prostrate stems, rarely (not in S. Afr.) erect shrubs; often scabrid or more or less hairy. *Leaves* petiolate, entire or palmately dissected, usually more or less cordate at the base. *Tendrils* simple, very rarely bifid or absent. *Flowers* monoecious, minute, greenish-yellow, usually the male and female ones produced in the same axil. *Male flowers* racemose or subumbellate on elongated peduncles, rarely fasciculate; receptacle campanulate, sepals short; corolla 5-partite, segments ovate-oblong; stamens 3, free, inserted on the receptacle; filaments very short, anthers entire or bi-partite, glabrous, 2-theous and the third 1-theous; thecae straight; connective often bifid, dilated or produced at the apex; rudiment of pistil minute. *Female flowers* sessile or shortly pedicelled, solitary or fascicled, very rarely racemose; receptacle, calyx and corolla as in the male; staminodes 0 or minute; ovary subglobose or ovoid, often beaked, 2-3-chambered with few ovules; style straight, not surrounded by a disc at the base; stigmas 3- or rarely 2-4-lobed. *Fruit* small, fleshy, subglobose to ovoid or oblong, obtuse to beaked, smooth, few seeded, when ripe red and circumscissile near the base. *Seeds* obovoid, tumid; cotyledons obovate, thick, fleshy; radicle small, conical.

Type species: *C. welwitschii* (Naud.) Hook. f. ex Welw. (the only species mentioned by Welwitsch).

Mainly centred in Africa in the drier subtropical and tropical zones, extending through Arabia to India and with a few species in America. In the latest monograph (1916), 38 species are distinguished, but a critical re-examination would probably reduce this number to about 20 or even less.

Corallocarpus is closely related to *Kedrostis* but differs constantly in the circumscissile fruits. The species of *Corallocarpus* are mostly very similar in general appearance and indicate a "natural" genus.

- Fruit usually distinctly rostrate, stipitate to pedunculate; leaves white-punctate below, deeply 3-5-sect with acutely lyrate pinnatifid lobes, the ultimate segments narrow (southern portion of S.W. Africa, Namaqualand)..... 1. *C. dissectus*
- Fruit obtuse to rounded or sometimes acute but usually not distinctly rostrate; leaves not white-punctate below, entire or lobed to 3-5-sect but not with acutely pinnatifid lobes divided into narrow segments:
- Fruit usually stalked, ovoid to oblong, usually more or less acute at the apex..... 2. *C. welwitschii*
- Fruit sessile, broadly ellipsoid to subglobose, rounded at the apex..... 3. *C. bainesii*

1. *C. dissectus* Cogn., in Bull. Herb. Boiss. 2me. sér. 1: 881 (1901); Pflanzenreich 275.1: 160 (1916). Type: *Dinter* 2 in Z.

Stems slender, sulcate, somewhat geniculate at the nodes. *Leaves* triangular-ovate or somewhat cordate in outline, 3–6 cm in diam., digitately 3–5-partite to the base with pinnatifid segments; ultimate segments usually few, often concave, linear, acute; upper surface as a rule glabrous and more or less smooth; lower surface usually finely scabrid with small acute whitish tubercles; petioles slender, glabrous, smooth, 5–20 mm long. *Tendrils* filiform, slender, usually elongate, glabrous. *Male flowers*: common peduncle slender to filiform, straight, glabrous, sulcate, 3–12 cm long, at the apex sub-capitately 3–8-flowered; pedicels capillary patent, 1–3 mm long; receptacle campanulate, glabrous, about 1.5 mm long, sepals erect, triangular-subulate, nearly 0.5 mm long; petals about 1 mm long. *Female flowers* solitary or in few-flowered fascicles (rarely more than two together), shortly pedicelled; ovary ovoid or ellipsoid, long-rostrate. *Fruit* on a much elongating, up to 3 cm long, much incrassate, usually slightly to distinctly clavate, glabrous pedicel, subglobose or broadly ellipsoid, rounded to subtruncate at the base, with a narrowly conical, up to 7 mm long rostrum, glabrous, 7–14 mm long without the rostrum, 7–10 mm in diam. *Seeds* ovoid, slightly compressed, smooth, faintly margined, 6 mm × 3 mm × 1.5 mm.

SOUTH WEST AFRICA.—Gibeon: Gründorn, *Range* 1339 (SAM). Bethanien: Inachab, *Dinter* 2 (Z, type!); Sandverhaar, *Dinter* 1201b (PRE, SAM); Tschaunap Mission Station, *Gerstner* 6356 (PRE). Warmbad: Warmbad, *Pearson* 4282 (BOL).

CAPE PROVINCE.—Bushmanland: between Wortel and Dabainoris, *Pearson* 3032 (BOL). Gordonia: Gonsis, *Wilman* Hb. no. 579 (KMG).

2. *C. welwitschii* (Naud.) Hook. f. ex Welw., Sert. Angol. in Trans. Linn. Soc. 27: 32, t. 12 (1869); Fl. Trop. Afr. 2: 566 (1871); Cogn., Mon. Cucurb. 651 (1881); Pflanzenreich 275.1: 162 (1916).

Rhynchocharpa welwitschii Naud. in Ann. Sci. Nat. 4me. sér. 17: 198, t. 10 (1862). *Corallocarpus schinzii* Cogn. in Abh. Bot. Ver. Brandenb. 30: 153 (1888); op. cit. 162 (1916). *C. gilgianus* Cogn. in Pflanzenreich 275.1: 163 (1916). *C. glaucicaulis* Dinter & Gilg. ex Dinter in Fedde, Repert. 16: 241 (1919), nomen. *C. scaber* Dinter & Gilg. ex Dinter, op. cit., p. 241, nomen. *C. bequaertii* De Wild. in Rev. Zool. Afr. 9, Suppl. Bot. B. 91 (1921); Pl. Bequaert. 1: 559 (1922); Robyns, Fl. Spermat. Parc Nat. Albert 2: 393 (1947).

Type: Naudin described this plant from cultivated specimens grown in the botanical garden in Paris from seeds sent by Dr. Welwitsch from the botanical garden, Lisbon. These plants were obviously of the same origin as the specimens distributed under the number *Welwitsch* 799, which was reported to be cultivated in Lisbon. The plates accompanying Naudin's and Welwitsch's descriptions are also representative.

Perennial, often somewhat glaucous. *Rootstock* tuberous, usually somewhat fusiform. *Stems* annual, herbaceous, only becoming woody very late, slender to rather stout, angular-sulcate, often geniculate, thickened at the nodes, shortly scabrid-setose on the ridges between the grooves, glabrescent to glabrous, up to 2 m long, rarely longer; internodes usually 3–10 cm long. *Tendrils* usually slender to filiform, thicker and sulcate-ribbed near the base, glabrous or scabrid-setose towards the base. *Leaves* cordate to orbicular-cordate, oblong-cordate or occasionally hastate-cordate in outline, 3–8 cm long and 2–7 cm wide, cordate at the base (usually deeply so with a conspicuous basal sinus), either undivided or more or less distinctly lobed to deeply palmately 5-sect; if lobed, the lobes variable but usually narrowed at the base, sometimes lobulate; apices of leaves (and lobes) acute or obtuse, mucronate; leaf-margins dentate to sinuoso-dentate or lobulate to occasionally nearly entire; both surfaces but especially the paler lower one usually shortly scabrid-hispid; petioles usually sparsely and shortly scabrid-setose, 2–5 cm long. *Male flowers*: common peduncle straight, glabrous, capitately 2–8-flowered at the apex, 1–6 cm long; pedicels filiform, erecto-patent,

1–3 mm long; flowers minute. *Female flowers* solitary or 2 to few together in fascicles, on short stout pedicels. *Fruit* on a stout subclavate peduncle up to 1 cm long, ellipsoid to oblong, usually not very acute at the apex, smooth and ultimately usually quite glabrous, 5–8-seeded, 15–20 mm long and 8–12 mm in diam. *Seeds* about $3.5 \times 2 \times 1.5$ mm.

ANGOLA.—Specimens grown in botanical garden, Lisbon, from seeds collected in Angola (probably in Loanda): *Welwitsch* 799 (COI, original material from which *Welwitsch* collected seeds sent to Naudin in Paris).

SOUTH WEST AFRICA.—Kaokoveld: Ohopoho, *de Winter & Leistner* 5213 (K, M, PRE). Grootfontein: *Schinz* 298 (Z); *Schoenfelder* 927 (PRE); farm Kumkauss, *Kinges* 2913 (PRE); Auros, Otavi, *Dinter* 5525 (B); Nama Pan, *Story* 5315; Aha Mts., *Story* 6377 (PRE). Outjo: between Kamanjab and Outjo, *de Winter* 3065 (PRE). Omaruru: *V. Maltzahn* S.W.A. 7 (BOL). Okahandja: *Dinter* 443 (SAM, isotype of *C. gilgianus* Cogn.): 534 (PRE, SAM); 3088 (PRE, SAM); *Bradfield* 318A (PRE); *Rapsom* 5 (PRE). Karibib: *Dinter* 6729; 6992a (B); Klein Ameib, *Dinter* 7095 (B). Okomitundu: *Seydel* 1346 (PRE). Windhoek: Awas Mts., *Pearson* 9616 (BOL); Windhoek: *de Winter* 2700 (PRE); farm Otjisewa, *Wiss & Kinges* 805; farm Rietfontein, *Strey* 2540 (PRE); farm Lichtenstein, *Dinter* 4578 (B). Rehoboth: farm Djab, *Walter* 4510 (M); Naukluft Mts. near Ababis, *Pearson* 9698 (BOL, probably this species); farm Buellspport, *Strey* 2044 (PRE); Rehoboth or Maltahöhe: Gamis, *Dinter* s.n. (SAM); Maltahöhe: Usib River near Nomtsas, *Pearson* 9303 (BOL). Gibeon: Haribes, *Volk* 2351/56 (M); Voigtsgrund, *Pearson* 9363 (BOL). Lüderitzbucht: Aus, *Schinz* 306 (BR, Z, isotype and type of *C. schinzii* Cogn.); *Dinter* 6270 or 6276 (B); *Kräusel* 866 (M); Kahrnstal, *Dinter* 8165 (B, M); farm Gamochab, *Kinges* 2505 (PRE). Keetmanshoop: near Narubis, *Acocks* 18020 (PRE); Gründorn, *Pearson* 4275 (BOL). Warmbad: Great Karasberg, Kraikluft: *Pearson* 8112; 8115 (BOL); Narudas-Süd, *Pearson* 8177 (BOL, SAM); 8522 (BOL). Exact district unknown: Omaruru or Rehoboth, “Farm Weissenfels”, *Volk* 1485/56 (M); without locality: *Schaefer* 927 in Herb. *Dinter* 3887 (B).

BECHUANALAND PROTECTORATE.—Near Molepolole, *Miller* B/564 (PRE).

CAPE PROVINCE.—Hay: Niekerk’s Hoop, *Wilman* Hb. No. 1407 (KMG, BOL); Lanyon Vale, *Acocks* 474 (KMG); Dunmurry, *Wilman* Hb. No. 2620 (KMG, BOL).

Also recorded from the Belgian Congo (e.g. *Gillett* 3190! from Moanda in BR, cited by Cogniaux 1916).

Young plants have, according to observations in the garden of the Division of Botany, usually undissected leaves. Similarly, young shoots often form first undissected leaves and later more dissected leaves. These undissected leaves occasionally occur in older plants or shoots and such plants have been described as a different species, viz. *C. schinzii*. Strangely enough, Cogniaux described a var. *subintegriifolia* of *C. welwitschii* in Mon. Cucurb. 652 (1881) and a var. *lobatus* Cogn. of *C. schinzii* in Pflanzenreich 275.1: 163 (1916). This renders the distinction between the two very obscure, because the other characters used by Cogniaux in his key in the 1916 monograph, viz., verruculose seeds (in *C. welwitschii*) against smooth seeds (in *C. schinzii*) and an acute base to the male receptacle (in *C. welwitschii*) against a rounded receptacle (in *C. schinzii*), do not hold. These two names are clearly synonymous. *C. gilgianus*, as is clear from an isotype (*Dinter* 443 in SAM), is only an extreme form with very narrow leaf-segments. *C. welwitschii* is sometimes very similar in appearance to *C. bainesii* (= *C. sphaerocarpus*), but is certainly distinct from the latter. Not only does it differ in some morphological features (such as the fruits), but it is known that the Bushmen eat the roots of *C. welwitschii* and not its leaves, whereas they do not eat the bitter roots of *C. bainesii* but eat its leaves as a salad. The Bushmen know the differences between the two quite well. In addition, the plants grow perfectly true from seed and retain all the morphological characteristics of the mother plant and

their ecology is also quite different. *C. bainesii* is a typical "Kalahari plant" in its distribution; it occurs in South West Africa only in the Okavango and in the Grootfontein, Otjiwarongo, Gobabis, Okahandja and Keetmanshoop districts and is widespread in the arid sandy areas of Bechuanaland, Griqualand-West and the Transvaal. *C. welwitschii* is found in most of the remaining districts of South West Africa with the exception of the Namib desert and extends northwards into the Belgian Congo but not far to the east. It seems to avoid the arid sandy areas preferred by the other species.

3. *C. bainesii* (Hook. f.) A. Meeuse, comb. nov.

Rhynchocharpa bainesii Hook. f. in Fl. Trop. Afr. 2: 564 (1871). Type: Chapman & Baines s.n. (K, holo!) from Norton Shaw Valley, N'gamiland (see notes).

Kedrostis bainesii (Hook. f.) Cogn., Mon. Cucurb. 644 (1881); Pflanzenreich 275.1: 150 (1916).

Corallocarpus sphaerocarpus Cogn. apud Schinz in Abh. Bot. Ver. Brandenb. 30: 151 (1888); Pflanzenreich 275.1: 164 (1916). *C. sphaerocarpus* var. *scaberrimus*, and var. *hastatus* Cogn. in Bull. Herb. Boiss. 3: 422 (1895); Burt Davy, Fl. Transv. 1: 226 (1926). *C. dinteri* Cogn., op. cit. 165 (1916).

Stems branched usually from near the base, usually slender except in lower portions, slightly fleshy, geniculate at the nodes, glabrous or scabrid, in the older parts usually as if covered with whitish scales, up to 1 m long. *Tendrils* glabrous, or sometimes scabrid. *Leaves* somewhat rigid (slightly fleshy when fresh), in outline ovate or suborbicular-cordate at the base, 3-8 (-12) cm long and broad, usually distinctly palmately 3-5-lobed, either with oblong lobes which are somewhat constricted at the base and rounded and mucronate at the apex, or subhastately 3-lobed with a large central lobe and somewhat reflexed subrotundate basal lobes; the segments entire, undulate or sublobulate, usually densely and shortly setose-hairy on upper surface, glabrous or scabrid below or scabrid throughout; petioles puberulous to shortly hispidulous or scabrid, rarely glabrous, 1-4 cm long. *Male flowers*: common peduncle filiform, straight, glabrous, 1-3 cm long, up to 12-flowered, pedicels capillary, erectopate, 1-2 mm long, flowers minute. *Female flowers* solitary to few-flowered, sessile or almost sessile. *Fruit* sessile or almost so, ellipsoid or ovoid, smooth and ultimately glabrous or shortly pubescent, rounded and often with a short apiculus at the apex, often about 6-seeded, 10-16 mm long and 8-10 mm in diam. *Seeds* 4-5 × 2.5-3 × 2-2.5 mm.

SOUTH WEST AFRICA.—Okavango: *Schoenfelder* 29 (PRE). Grootfontein: *Schinz* 303; 305 (Z, syntypes of *C. sphaerocarpus*); S. of Grootfontein, *Schoenfelder* 925 (PRE); Tsumeb: *Dinter* 7583 (B); Otavi: *Dinter* 630 (PRE, SAM, type gathering of *C. dinteri* Cogn.); 5292 (B, BOL, NH, PRE, SAM); ex Otavi, cult. at Okahandja, *Dinter* 3089 (SAM). Otjiwarongo: *Barnard* 249 (SAM); Klein Waterberg, Okosongomingo, *Volk* 217 (M); Okahandja: farm Quickborn, *Bradfield* 317 (PRE). Gobabis: Omitara, *Liebenberg* 4594 (PRE); Sandfontein, *Wilman* H. No. 1660 (KMG, SAM); 50 miles E. of Gobabis, *de Winter* 2475 (PRE). Keetmanshoop: 21 miles S.E. of Aroab, *de Winter* 3439; *Acocks* 18087 (PRE).

BECHUANALAND PROTECTORATE.—Kachikau, *Munro* ML 9 (PRE) and grown from its seeds in Pretoria, *Meeuse* 9640 (PRE); Ngami, on koppies, *Van Son* in T.M. 28804 (PRE); Ngamiland, *Curson* 573; Mochudi, *Harbor* in Hb. Rogers 6511 (BOL).

CAPE PROVINCE.—Vryburg: Palmyra (60 miles N.W. of Vryburg), *Rodin* 3605A (BOL). Barkly West: near Border, *Acocks* 1874 (KMG, PRE); Pniel, *Acocks* Hb. No. KMG 4226 (BOL, KMG); Newlands, *Esterhuysen* 1226 (BOL), *Lewis* Hb. No. 53464 (SAM); Hay: Paaufontein, *Cooke* Hb. No. 1405 (BOL, KMG); Herbert: Campbell, *Wilman* Hb. No. 1405 (BOL, KMG); St. Clair, Douglas, Orpen in Hb. *MacOwan* 153 (SAM). Kimberley: Doornlaagte, *Power* Hb. No. 4117 (BOL, KMG).

TRANSVAAL.—Soutpansberg: Messina, *Gerstner* 5445 (PRE); near Soutpan, *Obermeyer, Schweickerdt & Verdoorn* 30 (PRE); between Saltpan and Waterpoort, *Stopp* M7 (M); Msekwa's Poort, *Gerstner* 5947a (PRE); Bandolierkop, *Gerstner* 5681 (PRE). Sibasa: Chipise, *Verdoorn* 2009 (PRE). Waterberg: near Monte Christo, *Codd* 6598 (PRE). Warmbad: Rooiberg, farm Sandfontein, *Forssman* s.n. (PRE). Potgietersrus: farm Doornpoort (Rehmann's "Klippan") near Grass Valley, *Meeuse* 9481 (PRE). Lydenburg: near Morone, *Codd & Dyer* 7728 (PRE). Pretoria: near Pienaar's River, *Acocks* 12470 (PRE). Kruger National Park: Stonwane, *van der Schijff* 1918 (PRE). Barberton: Komatipoort, *Schlechter* 11812 (BOL, COI, GRA, Z); *Burr* Davy 380 (BOL).
 NATAL.—Ingwavuma: Ndumu, *Gerstner* 3470 (NH).

In addition, Southern Rhodesia and Portuguese East Africa.

The type sheet (K, photo. in PRE) contains a mixture of two species, the other being *Coccinia rehmannii* Cogn. There can be no doubt that the description of *Rhynchoscarpa bainesii* Hook. f. applies to the portion that, though poor, is identical with *Corallocarpus sphaerocarpus* Cogn., and a new combination is required.

8. RAPHANOCARPUS

Raphanocarpus *Hook. f.*, *Icon. Pl.* 11: 67, t. 1084 (1871); *Fl. Trop. Afr.* 2: 540 (1871); *Cogn.*, *Mon. Cucurb.* 426 (1881); *Pflanzenreich* 275.2: 56 (1924); *Pax in Pflanzenfam.* 4, 5: 25 (1889); *Chiov.*, *Fl. Somal.* 1: 181 (1929); *Phill.*, *Gen. ed.* 2: 718 (1951). *Momordica* sect. *Raphanistrocarpus* *Baill.* in *Bull. Soc. Linn. Paris* 1: 309 (1882); *Hist. Pl.* 8: 407, 442 (1886). *Raphanistrocarpus* (*Baill.*) *Pax in Pflanzenfam.* 4.5: 25 (1889); *Cogn.*, *op. cit.* 53 (1924).

Perennials with tuberous rootstock forming scandent or prostrate annual herbaceous or occasionally perennial woody stems, or annual herbs. *Leaves* petiolate, rarely sessile, usually ovate or cordate-orbicular, entire or slightly lobed. *Tendrils* simple. *Flowers* rather large, monoecious; *male flowers* in axillary pedunculate few-flowered racemes; common peduncle sometimes adnate to the petiole of the subtending leaf and, if so, usually exserted beyond its lamina; pedicels usually bracteate at the base; receptacle shortly campanulate to shallowly cup-shaped with 5 incurved scales at the base within; sepals ovate, elliptic or lanceolate, acute or acuminate; corolla-lobes elliptic, acute or acuminate, orange or yellow; stamens 3 or 4 or occasionally 2; filaments broadly linear, free; anthers 3 and, if so, two 2-theous and the third 1-theous, or 4 (3 1-theous, 1 2-theous) or 2 (1 3-theous, 1 2-theous); thecae linear, often flexuous or curved; connective narrow or broad, not produced beyond the anthers; rudimentary pistil represented by a gland (nectary) or 0; *female flowers* axillary, solitary or occasionally in pairs; pedicel usually not adnate to the petiole of subtending leaf; receptacle calyx and corolla as in the male but as a rule smaller; staminodes none; ovary slender, fusiform, sulcate, 1-chambered, with 2–5 partly pendulous, partly erect (or all erect) ovules; style short, slender; stigma capitate, entire or bilobed. *Fruit* dry, corky, fusiform, slender, 1-locular or sometimes with 2 or more loculi formed by false transverse septa, indehiscent or irregularly longitudinally splitting. *Seeds* few, ellipsoid or linear-elliptic in outline; testa crustaceous, smooth; tegmen thin, hyaline; cotyledons more or less obovate, one slightly folded over the other; radicle, conical, acute.

Type species: *R. kirkii* *Hook. f.* (the only one originally described with the genus).

Two species (5 described ones) in southern tropical and subtropical Africa (both extending into South Africa) and, in addition, one species in Somaliland.

Cogniaux and Harms (1924) maintained the two genera *Raphanocarpus* Hook. f. and *Raphanistocarpus* (Baill.) Pax, although Harms in a note (p. 54) already stated that they perhaps had better be united. However, the plants referred to these two genera are very similar in general appearance and it is felt that they cannot be generically distinct, a conclusion already reached by Chiovenda. Phillips (Gen., p. 748) mentions only one genus (*Raphanocarpus*) and the description given there appears to apply to *Raphanocarpus* s.s. However, he must have meant to include *Raphanistocarpus*, because the number of species given is 5. The omission of *Raphanistocarpus* (even as a synonym) may have been through an oversight, because the two names are so very similar.

Male peduncles adnate to the petiole of the subtending leaves; female peduncles very short

1. *R. welwitschii*

Male peduncles free to the base; female peduncles usually elongate, up to 8 cm long 2. *R. boivniii*

1. *R. welwitschii* Hook. f. in Fl. Trop. Afr. 2: 541 (1871); Cogn., Mon. Cucurb. 427 (1881); in Bot. Jahrb. 10: 270 (1888) and in Pflanzenreich 57 (1924); Hiern, Cat. Welw. Afr. Pl. 1 (2): 393 (1898); Dinter in Fedde, Repert. 23: 133 (1926/1927). Type: Angola, Mossamedes, *Welwitsch* 790 (K, holo.); *R. humilis* Cogn., op. cit. 149 (1888); 57 (1924). *R. humilis* Cogn. var. *prostratus* Susseng. in Mitt. Bot. Staatssamml. München, H. 8: 342 (Dec. 1953).

Annual, glabrous to sparsely pubescent. *Stems* herbaceous, slender, terete, sulcate, up to at least several meters long. *Leaves* firm to thinly coriaceous or sometimes membranous, cordate-ovate to cordate-suborbicular, usually somewhat 5-angled to 3-cuspidate, cordate at the base with a narrow sinus and rounded usually overlapping basal lobes, gradually acuminate into a narrowly triangular tip ending in a long subulate mucro, entire or sinous to bluntly dentate or crenate; nerves slender, somewhat prominent below; blade 3–9 cm long, 2–7 cm wide; petioles slender, flattened, sulcate-striate, 2–9 cm, occasionally up to 12 cm long. *Male flowers*: free part of peduncle terete, slender to filiform, usually slightly shorter than the subtending leaf, much smoother than connate part; pedicels 4–12 mm long; bracts lanceolate, up to 13 mm long, narrowly acuminate; receptacle short; sepals lanceolate, much acuminate, usually very sparsely pubescent, 10–20 mm long and 2.5–4 mm wide; corolla orange, petals obovate-oblong, obtuse to subacute, 2.5–3.5 cm long. *Female flowers*: pedicels short, in fruit somewhat incrassate and up to 20 mm in length; ovary narrowly fusiform, thinly pubescent, about 15 mm long; sepals linear-subulate or lanceolate-subulate, 4–5 mm long; petals 12–16 mm long. *Fruit* striate-ribbed, rostrate, glabrescent, 2- or 3-seeded, up to 6 cm long. *Seeds* nearly smooth, distinctly attenuate and finely corrugated near the base, rounded at the apex, 11–12 mm long, 3.5–4.5 mm wide and 1.5–2 mm thick.

Found in Angola, extending into Belgian Congo, Southern Rhodesia and South West Africa.

ANGOLA.—Membassaco: Cubal, *Faulkner* 132 (PRE); Capacca, *Faulkner* 361 (PRE). SOUTH WEST AFRICA.—Kaokoveld: near Orawanjai, *de Winter & Leistner* 5643 (K, M, PRE); Ohopoho, *de Winter & Leistner* 5326 (K, M, PRE); between Franzfontein and Khorikasa, *Belck* 60 (Z). Ovamboland: Oshando, *Schinz* 314 (Z); Ombahaka, *Rautanen* 492 (Z); Kamanyab, *Thorne* Hb. No. 31873 (SAM); near Tsuwandes, *de Winter* 3057 (PRE). Outjo: *Thorne* Hb. No. 31787 (SAM); Pamela, *Volk* 2893 (NH). Grootfontein: Namutoni, *Breyer* in T.M. 20657 (PRE); Namutoni & Sandup, *Barnard* s.n. (SAM); Tsumeb: *Marsh* s.n. (PRE); Grootfontein, *Schoenfelder* S 407 (PRE). Okahandja: Otjihua, *Dinter* 460 (PRE, SAM); Okahandja, *Dinter* 4617 (B); District unknown, but in northern part: Kaiantes, *Thorne* Hb. No. 31784 (SAM); Cayimaëis, *Thorne* Hb. No. 31786 (SAM). Swakopmund or Karibib: "Kuiseb", *Fleck* 498 (Z). Karibib: Karibib, *Rautanen* 512; 520 (Z, two of the numbers

cited by Cogniaux sub *R. humilis* Cogn.); Marloth 1291 (GRA); Dinter 6782 (B); Kinges 3126 (PRE, cited by Sussenguth as *R. humilis* var. *prostratus*); Khan River, Dinter 67 (Z); between Karibib and Okahandja, de Winter 2668 (PRE); probably Karibib, Fleck 2a (Z); between Swakopmund and Okahandja or Okahandja: Mrs. Kolbe (Miss Elliott) in Herb. Rehmann (Z). Gobabis: Steyn O.P. 1541 (PRE); between Gobabis and Windhoek, de Winter 2512. Localities not precisely known but in central and northern areas: "Hereroland": Marloth 8543 or 8573 (PRE); Nels 26; 27 (Z); "Tabakstuin": Dinter 247 (Z); possibly Windhoek distr.: Dinter s.n. (leg. 1911) in SAM. Rehoboth: Schinz 315 (Z); between Rehoboth and Uhlenhorst, Wilman 450 (BOL, PRE); Naukluft Mts., Buellsport, Strey 2161 (PRE). Without precise locality: Fleck 947 (Z); Nortier s.n. (BOL).

The type was not studied, but specimens referred to this species by Cogniaux leave very little doubt about the identity of the species concerned, for example: Schinz 314, Marloth 1291, Fleck 2a, 498, 947, Rautanen 492, Dinter 247, 460.

Dinter (Neue u. wenig bekannte Pfl. D.S.W. Afr., p. 48 (1914) had already pointed out that "*Raphanocarpus humilis* Cogn." is only a depauperate form of *R. welwitschii*. A comparison of some specimens referred to *R. humilis* by Cogniaux viz., Rautanen 512 and 520, clearly shows that Dinter correctly reduced this species to a synonym of *R. welwitschii*. However, in 1953 Suessenguth described a var. *prostrata* of "*R. humilis*" of which a quoted gathering (Kinges 3126) was available for study. Almost needless to say, this specimen and the supposed variety belong to *R. welwitschii* = *R. kirkii*.

2. *R. boivinii* (Baill.) Chiov., Fl. Somal. 1: 181 (1929).

Momordica boivinii Baill., Hist. Pl. 8: 407, f. 289-291 (1886).

Raphanistrocarpus boivinii (Baill.) Cogn. in Engl., Pflanzenwelt O.-Afr. C. 397 (1895); Pflanzenreich 54 (1924); Burt Davy, Fl. Transv. 1: 224 (1926). *R. asperifolius* Cogn., Pflanzenreich 56 (1924).

Raphanocarpus tuberosus Dinter, Neue u. wenig bekannte Pfl. D.S.W. Afr. 48 (1914), nomen nudum, et in Fedde, Repert. 23: 133 (1926-1927) nomen tantum. *R. asperifolius* (Cogn.) Chiov. l.c.

Perennial forming annual herbaceous stems from a tuberous rootstock. Stems slender, deeply sulcate, glabrous or thinly hairy, up to 5 m long. Leaves membranous, cordate-oblong, or triangular-ovate, undivided or slightly 3-5-lobed, often somewhat angular, triangular-acuminate at the apex with the tip obtuse or subacute, distinctly mucronate, cordate at the base with broadly rounded, free or overlapping basal lobes and a narrow, rarely wide, basal sinus, remotely and often somewhat irregularly callosodentate to coarsely dentate with the teeth callosomucronate; 2-7 cm long and 1.2-5 cm wide; on both surfaces more or less densely and shortly setose-scabrid or later finely punctate, more densely so and hence ciliate near the margin; nerves slender, not or hardly prominent below; petioles slender, thinly hairy to glabrous, 0.8-2.5 cm long. Male flowers: common peduncles filiform, terete, firm, smooth, glabrous or rarely somewhat hairy, 2-8 cm long; pedicels capillary, usually puberulous, up to 12 mm long; bracts small, narrow; sepals lanceolate-triangular, acute, usually thinly covered with short stiff hairs, 10-14 mm long; petals yellow or light orange, often with dark centre, narrowly obovate, obtuse to subacute, 1.5-2 cm long. Female flowers: peduncles slender, filiform, short or (in fruit) up to 8 cm long, with a subulate, 4-7 mm long bract at the apex; in fruit incrassate towards the apex and finely sulcate; ovary linear-fusiform, in anthesis 10-12 mm long, usually shortly hairy mainly in lines following the faint longitudinal ribs; sepals lanceolate or lanceolate-subulate, usually hairy, acute, 3-4 mm long; petals but slightly smaller than in the male flowers. Fruit fusiform, attenuate at both ends, usually faintly striate-ribbed, ultimately often glabrous, 4-7 cm long and 4-6 mm in diam. Seeds subcylindric-fusiform, not or slightly compressed, at both ends subtruncate and finely rugose, otherwise smooth, 9-13 mm long, 3-5 mm in largest diam.

Type specimen: This must be a specimen collected by Boivin in Mombasa cited by Cogniaux (now probably in P)—not seen.

Recorded from East Africa (Mombasa) to South West Africa, Southern Rhodesia, Transvaal and Portuguese East Africa. Not yet recorded from Bechuanaland Protectorate (although to be expected there).

SOUTH WEST AFRICA.—Grootfontein: Otavi, *Dinter* 744 (PRE, SAM); 5366 (B, BOL, NH, PRE, SAM); Tsumeb, *Barnard* 173 (SAM); *Naegelsbach* 7D (PRE); Grootfontein, *Boss* s.n. (PRE). Otjiwarongo: Waterberg Plateau, *Boss* s.n. (PRE). Okahandja: farm Quickborn, *Bradfield* 307 (PRE); Okahandja, *Dinter* 505 (SAM). "Between Windhoek and Walvis Bay": *Esdaile* in Herb. Rogers 15325 p.p. (J). *N.B.*—The numbers *Dinter* 505, and 744 have been cited by *Dinter* (1926/1927) as *R. tuberosus* and *Dinter* 5336 has been distributed under that name.

TRANSVAAL.—Warmbaths: Rooiberg Valley, Kwarriekraal, *Mogg* s.n. Brits: farm Welgevonden, *Mogg* 14639. Lydenburg: Griffen Mine, *Breyer* in T.M. 19725; near Branddraai, *Codd* 3268; near Ohrigstad, *Young* A 535 (all PRE). Letaba: Shilowane, *Breyer* in T.M. 21460 (PRE); between Shilouvane and Spelonken, *Junod* 1489 (Z). Nelspruit: Kaap Muiden, *Mogg* s.n. (PRE); Klokwene, *van der Schijff* 3228; M'Bianide Spruit, *van der Schijff* 2180 (all PRE). Sibasa: Punda Maria, *van der Schijff* 3604. PORTUGUESE EAST AFRICA.—Niasa: nr. Gurue, *Hornby* 4562 (PRE); Nampula, *Torre* 1411 (COI); Mandimba, *Hornby* 4509 (PRE).

Although the type specimen was not studied, Baillon's figures cited above are quite adequate to recognise this species.

This plant varies in degree of pubescence and the more densely hairy form described by Cogniaux (1924) as *Raphanistocarpus asperifolius* is not worthy of a separate specific or even a varietal status.

9. MOMORDICA

Momordica L., Sp. Pl. ed. 1: 1009 (1753); Gen. Pl. ed. 5: 440 (1754); Ser. in DC., Prodr. 3: 311 (1828); Naud. in Ann. Sci. Nat. 4me. sér. 12: 129 (1859); Sond. in Fl. Cap. 2: 491 (1862); Benth. & Hook. f., Gen. Pl. 1: 825 (1867); Hook. f. in Fl. Trop. Afr. 2: 534 (1871); Cogn., Mon. Cucurb. 427 (1881); in Pflanzenreich 8 (1924); Bail., Hist. Pl. 8: 441 (1886), partim; Pax in Pflanzenfam. 4, 5: 23 (1889); Phillips, Gen. ed. 2: 748 (1951).

Mostly perennial, sometimes annual, often forming annual scandent or prostrate stems from a tuberous rootstock. *Leaves* entire, lobed or palmately or pedately 3–9-foliate. *Tendrils* simple, rarely bifid. *Flowers* monoecious or sometimes dioecious; often rather large; *male ones* corymbose, subumbellately racemose or solitary, often bracteate at the apex of the peduncle or lower down; receptacle shallowly cup-shaped, campanulate or shortly funnel-shaped with 2–3 incurved scales decurrent from the petals near the base inside, sometimes with a few additional smaller scales decurrent from some or all of the stamens; sepals variable; corolla-lobes usually ovate, elliptic or orbicular, sometimes hairy; stamens 3; filaments free or somewhat cohering; anthers at first cohering, later free, two 2-thecous and the third 1-thecous; thecae conduplicate; connective bilobed, not produced at the apex; rudiment of pistil 0 or represented by a gland; *female flowers* solitary; receptacle, calyx and corolla as in the male; but scales in base of receptacle usually smaller; staminodes 0 or represented by 3 glands at the base of the style; ovary oblong in outline or fusiform, with 3 placentas and many ovules; often echinate; style slender; stigmas 3, entire or bifid. *Fruit* a dehiscent 3-valved or sometimes indehiscent berry; oblong, ellipsoid, fusiform, ovoid or cylindrical, smooth, echinate, with soft spines or with short protuberances, few- to many-seeded, usually orange or bright red when ripe. *Seeds* thick or compressed, smooth or variously sculptured; testa crustaceous; tegmen thin, membranous; cotyledons elliptic; radicle shortly conical.

Type species: *M. charantia* L.

A tropical and subtropical genus found in the Old World, the few species in America most probably introduced; valid species about 80, mostly African.

Leaves palmately-pedately pluri-foliolate with 3 groups of 3 or more leaflets..... 1. *M. clematidea*
Leaves undivided to palmatifid but not compound:

Leaves undivided to faintly lobed or angular, ovate-cordate or narrowly cordate to cordate-triangular, minutely to rather coarsely denticulate or crenate-dentate; male flowers in a few-flowered subumbellate raceme or solitary; ovary densely setose; fruit ellipsoid or ovoid, bright orange-yellow, softly and densely setose-aculeate..... 2. *M. foetida*

Leaves more or less lobed to palmatifid:

Tendrils bifid; leaves membranous when dry, finely scabrid, scabrid punctate or smooth; plant glabrous or nearly so..... 3. *M. welwitschii*

Tendrils simple or, if divided, leaves not drying membranous and plant pubescent at least on the younger portions:

Tendrils always simple; petals of male flowers 12–20 (–24) mm long, those of female flowers usually smaller than in the male flowers:

Bract of male flowers above the middle, usually a little below the calyx:

Petals of the male flowers light yellow, up to 15 mm long; calyx usually green; leaves drying a pale somewhat yellowish green as a rule; larger lobes of older leaves with usually 7 or more teeth or lobules..... 4. *M. balsamina*

Petals of male flowers cream-coloured, green veined, the 3 larger ones with a dark blotch at the base; calyx dark purple to black at least on the receptacle; leaves dark green drying deep green or rather dark brown; larger lobes of older leaves with 3–5, rarely up to 9, teeth or lobules..... 5. *M. involucrata*

Bracts of male flowers below the middle..... 6. *M. charantia*

Tendrils, at least the older ones, usually bifid; petals of male flowers 20–30 mm long, those of female flowers as long as or longer than in the male flowers..... 7. *M. repens*

1. *M. clematidea* Sond. in Fl. Cap. 2: 491 (1862); Cogn., Mon. Cucurb. 434 (1881); Pflanzenreich 20 (1924); Burtt Davy, Fl. Transv. 1: 227 (1926). Syntypes: Burke 357 and Zeyher 578.

M. cardiospermoides Klotzsch in Peters, Reise Mossamb., Bot. 150 (1864); Hook. f. in Fl. Trop. Afr. 2: 535 (1871).

Perennial. *Stems* herbaceous, angular, glabrous, up to several meters long. *Leaves* biternately multifoliolate; petiole slender, glabrous or bearing tufts of hairs at the base and the apex, under 2 cm long; petiolules 3; of which the middle one is 1–5 cm long, its leaflet pinnately 5–7-foliolate, occasionally subpinnatifid, 1–6 cm long; the lateral petiolules shorter, their leaflets alternately pinnately 3–5-foliolate, up to 7 cm long including the petiolules; secondary petiolules 2–8 (–25) mm long; ultimate leaflets membranous, ovate or oblong, acute, rounded at the base, crenate-dentate with mucronulate teeth, glabrous, dark green and finely punctate-scabrous above, paler and smooth below, 0.5–3 cm long and 0.4–2 cm wide. *Tendrils* filiform, glabrous, simple or bifid. *Flowers* all solitary. *Male flowers*: peduncles filiform, glabrous, bracteate at the apex, 5–15 cm long; bract sessile, concave, suborbicular, entire, emarginate or subcordate at the base, 1–2 cm wide; receptacle subrotate, glabrous, 6–7 mm in diam., sepals ovate, obtuse to subacuminate, 5–7 mm long, 4–5 mm wide; petals yellow, a dirty green near the base inside, 1.5–2.5 cm long. *Female flowers*: peduncle ebracteate or with a small elliptic or oblong bract at the apex, 1–5 cm long; *Ovary* ellipsoid-fusiform, soon glabrous, smooth; sepals ovate-triangular, 2–3 mm long; corolla sometimes smaller than in the male flowers. *Fruit* fleshy, ovoid-oblong or oblong, acute, rounded at the base, smooth, orange red, 5–9 cm long and 2.5–5 cm in diam. *Seeds* dark brown, ovate, much compressed, with a few tubercles, 12–13 mm long, 8–9 mm wide and 3–5 mm thick.

Found from Northern Rhodesia and Tanganyika to Zululand, the Transvaal and Bechuanaland; fairly common, especially on sandy soil.

Recorded from the following districts: *Transvaal*: Soutpansberg to Barberton in the east, and Lydenburg, Bronkhorstspuit, Pretoria, Brits and Rustenburg in the south and west; *Natal*: Hluhluwe (Ward 1911, NH), Verulam.

The following specimens are of special interest: *Burke* 357 (SAM), duplicate of one of the twin-types from "Crocodile River" (probably Brits district) in the Transvaal and several specimens cited by Burt Davy, namely *Burt Davy* 2035 from Warmbaths (PRE); *Galpin* 705 from Barberton (PRE); *Rogers* 22508 from Barberton (PRE).

The reduction of *Momordica cardiospermoides* Klotzsch to *M. clematidea* was first made by Cogniaux in 1881. The type of the first (B) is now destroyed, but specimens from East Tropical Africa agree in every respect with those from the southern Transvaal and there can be no doubt that Cogniaux's reduction was correct.

2. *M. foetida* Schum. & Thonn., Beskr. Guin. Pl. 426 (1827); Cogn., Mon. Cucurb. 451 (1881); in Pflanzenreich 41 (1924); Burt Davy, Fl. Transv. 1: 227 (1927); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 181 (1931); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 181 (1951). Type: *Thonning* 85 from the Guinea Coast.

Momordica morkorra A. Rich., Tent. Fl. Abyss. 1: 292, t. 53 (1847); Naud. in Ann. Sci. Nat. 4me. sér. 12, p. 134 (1859); Hook. f. in Fl. Trop. Afr. 2: 538 (1871). *M. schimperiana* Naud., l.c. 23 (1867); Cogn., l.c. 453 (1881); 40 (1924); Hiern, Cat. Welw. Afr. Pl. 1 (2): 394 (1898); Andrews, l.c. (1951). *M. cordifolia* E. Mey. ex Sond., Fl. Cap. 2: 492 (1869); Naud., op. cit. (1867), p. 22; Pegler in Ann. Bolus Herb. 2, p. 117 (1917). *M. cucullata* Hook. f., l.c. (1971). *M. cordata* Cogn. in Bot. Jahrb. 21: 208 (1895), ex descr. *M. angustisepala* Harms in Bot. Jahrb. 58: 239 (1923); and in Pflanzenreich 41 (1924).

Cucumis? cordifolius E. Mey. ex Drege, Zw. Pflzgeog. Doc. p. 149, 176 (1843), nomen tantum.

Eulenburgia mirabilis Pax in Engl. Bot. Jahrb. 39, p. 654 (1907).

Perennial, dioecious or occasionally monoecious. *Stems* rather stout, glabrous or occasionally hairy, sulcate very often marked with small linear dark spots, up to 5 m long. *Leaves* ovate-cordate or narrowly cordate to cordate-triangular, acute or acuminate, with a usually broad and shallow cordate to truncate base in the centre decurrent into the petiole, and a minutely to rather coarsely denticulate or crenate-dentate margin, glabrous to hairy (especially so to subtomentose on lower surface) 6–16 cm long and 4–13 cm wide, petioles usually firm, 3–9 cm long. *Tendrils* simple or bifid. *Male plant*: common peduncle fairly slender, angular-sulcate, subumbellately few-flowered, 3–15 (occasionally up to 25) cm long, bracteate at the apex; bract varying from small and inconspicuous to large, up to 3 cm long and 5 cm wide (in S. Africa usually small), subreniform to oblong, often folded, boatshaped or cucullate, glabrous or hairy, entire or crenate to dentate; pedicels usually hairy, 0.5–7 cm long; calyx usually dark; receptacle wide and short, usually somewhat (and variously) hairy; sepals varying from broadly ovate to lanceolate, obtuse or sometimes acute, with a thinner and usually ciliate margin, 5–10 mm long, 5–8 mm wide; petals yellow, usually dark brown at the base inside, 2–3.5 cm long. *Female plants*: flowers solitary; peduncle rather slender, with or without a small bract near the base, middle or apex, 2–12 cm long (occasionally bearing in addition 1–3 male flowers); ovary ovoid-oblong or ellipsoid-fusiform, densely and softly muricate-setose, rostrate or narrowed at the apex, 15–20 mm long; calyx and corolla sometimes smaller than in the male. *Fruit* ovoid or ellipsoid, bright orange yellow, softly and densely setose-aculeate, 5–8 cm long, 3–5 cm in diam., irregularly dehiscent. *Seeds* dark brown, elliptic-oblong with a thin prominent margin, faintly rugose, 10–12 mm long, 6–7 mm wide and 3 mm thick.

Found in Africa south of the Sahara, extends southwards to Angola, the Transvaal and through Natal to the Eastern Cape Province.

Recorded from the following districts: *Transvaal*: Pietersburg, Letaba, Lydenburg, Belfast, Pilgrims Rest, Nelspruit, Barberton; *Swaziland*; *Natal*: Nongoma, Hlabisa, Weenen, Estcourt, Eshowe, Lower Tugela, Lions River, Pietermaritzburg, Inanda, Durban, Richmond, Umzinto; *Cape Province*: Umzimkulu, Kentani, Komgha.

The following specimens are noteworthy: Cape Province.—Between Umtata and Umsamwubo rivers (probably Port St. Johns distr.), "*Cucumis? cordifolius* E. Mey." leg. Drege (L); Natal.—Umzinto: Dumisa, *Rudatis* 1027 (PRE); Transvaal.—Pietersburg: Houtbosch, *Rehmann* 6312 (BR); Lydenburg: *Wilms* 486 (L, PRE); Barberton: *Galpin* 647 (BOL, PRE); 784 (PRE), all numbers cited by Cogniaux (1924) sub *M. foetida*; *Wilms* 486; *Rehmann* 6312 and *Galpin* 647; and 784 also cited by Burt Davy (1926).

There is a considerable variation in the pubescence of this species. The extreme forms [var. *villosa* Cogn. in Engl. Bot. Jahrb. 21, p. 208 (1895)] are connected by intermediates with almost entirely glabrous ones so that this variety is not maintained here. The tendrils can be simple or bifid and this character has no diagnostic value. The importance of the variation in the development of the bract on the male peduncles has been over-estimated, and several described species are merely forms which in larger series of specimens are all connected by intermediates.

3. *M. welwitschii* Hook. f. in Fl. Trop. Afr. 2: 538 (1871); Cogn., Mon. Cucurb. 435 (1881); Pflanzenreich 275.2: 23 (1924); Hiern, Catal. Welw. Afr. Pl. 2: 393 (1898). Type: *Welwitsch* 787 from Mossamedes (Angola) in BM.

Climbing herb. *Stems* slender, subterete, glabrous, smooth or longitudinally sulcate, older internodes 4–7 cm long. *Leaves* herbaceous drying membranaceous, in outline cordate-reniform to orbicular-cordate or broadly cordate with a wide and shallow basal sinus and the leafbase decurrent in the middle along the petiole, the apex acute to acutely acuminate; the blade 3–9 cm long and 2–9 cm broad, 5-angled and often subtrilobed to more or less distinctly 5–9-lobed (to about the middle), the lobes varying from triangular-ovate or elliptic-rhomboid to occasionally oblong, usually acute, often faintly lobular or coarsely dentate with usually acute and mucronate apices and lobes (or teeth), the margin minutely ciliate-scabrid; upper surface dark green, minutely scabrid to smooth, lower surface pale green finely scabrid-punctate; venation fine, the secondary and tertiary clearly visible on the lower surface, obscure on upper surface; sinuses between the lobes usually narrow and acute; petioles slender usually dorsolaterally flattened and often winged in upper half by the decurrent leafbase, glabrous, 1–7 cm long. *Tendrils* slender to filiform, glabrous or nearly so, bifid at about 1–2 cm from the base. *Flowers* monoecious, solitary. *Male flowers*: pedicels filiform, glabrous or puberulous near the apex, 4–7 cm long, ebracteate or with a minute bract near the middle or in upper half; calyx dark, black when dried, receptacle shallow 4–6 mm long, 6–10 mm in diam.; sepals oblong or elliptic to ovate-orbicular 5–6 mm long, minutely ciliate, otherwise glabrous; corolla cream-coloured to pale yellow with 3 black spots on the base of larger petals inside, nearly glabrous, 3–4 cm in diam.; the largest petals 15–20 mm long, broadly ovate, obtuse or subacute. *Female flowers*: pedicels as in the male, but up to 5 cm (usually under 4 cm) long, mostly ebracteate and slightly thickened towards the apex in fruit; ovary ellipsoid or ovoid, in open flower about 6 mm long and 4 mm in diam., sparsely covered with cylindrical papillae about 0.75 mm long, receptacle above the ovary and calyx smaller than in the male, together about 1.5 mm high and 4 mm in diam.; sepals black, broadly rounded at the apex 1–2 mm long; corolla as in the male but only $\frac{1}{2}$ – $\frac{2}{3}$ its size. *Fruit* resembling that of *M. balsamina*, broadly ovoid-ellipsoid or somewhat angular-ovoid, somewhat pointed or conical at the apex, glabrous, with a few longitudinal rows of sparse conical cylindrical protuberances, ultimately orange or red when mature; 2.5–3 cm long and 2–2.5 cm in diam. *Seeds* elliptic-discoid, light brown, with rugulose-wavy ridges along and near margin on flat surfaces, very shortly produced-stipitate at umbilical end, 9–10 mm long, about 7 mm broad and about 2 mm thick.

Found in southern Angola and Kaokoveld (South West Africa).

SOUTH WEST AFRICA.—Kaokoveld: Kapupa Valley, *Stroy* 5839 (PRE); 30 miles S. of Kunene on road to Orupembe, *de Winter & Leistner* 5789 (PRE); near Ohopoho, *de Winter & Leistner* 5279 (PRE).

4. *M. balsamina* L., Sp. Pl. ed. 1: 1009 (1753); Sér. in DC., Prodr. 3: 311 (1828); Sond. in Fl. Cap. 2: 491 (1861); Hook f. in Fl. Trop. Afr. 2: 537 (1871); Cogn. Mon. Cucurb. 439 (1881); Pflanzenreich 28 (1924); Burt Davy, Fl. Transv. 1: 227 (1926); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 181 (1931); Range in Fedde, Repert. 38: 273 (1935); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 181 (1950). *M. gariopensis* E. Mey. ex Drege, Zw. Pflzgeog. Doc. 202 (1843), nomen tantum; ex Sond., l.c., in syn. *M. schinzii* Cogn. in Abh. Bot. Ver. Brandenb. 30: 149 (1888); Pflanzenreich 30 (1924); Range in Fedde, Repert. 38: 273 (1935).

Perennial herbaceous climber. *Rootstock* tuberous. *Stems* several to many, slender, sulcate, usually soon glabrous, up to 2 m long and over, occasionally attaining 10 m. *Leaves* suborbicular in outline, membranous or thinly herbaceous, glabrous or slightly hairy mainly on the larger nerves below, smooth or minutely punctate, sometimes scabridulous, 3–7 (–10) cm in diam., 5–7-lobed to about the middle; the lobes rhomboid or obovate to elliptic-rhomboid obtuse and long-mucronate to acute, coarsely and irregularly dentate-lobulate with in the larger leaves usually 7 or more teeth or lobules; lowermost leaf-segments considerably smaller; petioles slender, usually glabrous, sometimes shortly setose-pubescent 1–3 cm long. *Tendrils* slender, simple, glabrous or somewhat hairy. *Flowers* monoecious, all solitary. *Male flowers*: peduncles filiform or very slender, glabrous or usually somewhat hairy towards the apex, up to 5 cm occasionally to 9 cm long; bract sessile at or just below the apex of the peduncle, sub-membranous, whitish, green-veined, ovate to orbicular or reniform, cordate at the base, 5–10 mm long and 8–15 mm broad, entire or finely dentate, acute to mucronate-aristate; calyx green or occasionally purplish-black, often softly and rather densely hairy; receptacle shallow, 2–4 mm high and 5–8 mm in diam., sepals ovate to elliptic, acute and aristate-mucronate, 5–7 mm long and 3–5 mm broad; corolla pale yellow; petals unequal (outer 2 slightly larger), ovate to obovate, acute to cuspidate or rounded to emarginate and mucronulate, 7–15 mm long and 5–12 mm broad. *Female flowers*: peduncle ebracteate or bracteate near the base or the middle, 0.5–3 cm long; ovary oblong-fusiform or ovoid-fusiform, rostrate, verrucose, glabrous or softly hairy with curled woolly hairs; sepals narrowly triangular to ovate-triangular, acute to acuminate, 2–3 mm long; corolla as in the male but often smaller. *Fruit* subglobose to ovoid with a broad conical rostrum and abruptly and shortly attenuate at the base, bright orange-red to scarlet when ripe, rather sparsely muricate or tubercled, 2.5–5 cm long and 2–4 cm in diam. *Seeds* with a carmine-red arillus, brown, ovate or oblong to elliptic in outline, much compressed, finely verruculose on the large faces and marked with sinuous raised ridges which usually form an elliptic figure and extend to the edges often making the latter appear finely corrugated, grooved on the lateral faces, 8–12 mm long, 5–7 mm broad and 1.5–2 mm thick.

Type specimen: Linné (1753), in the original diagnoses, cited several “pre-Linnaean” publications, among them the Pinax 306 by Bauhin. The species is also represented in the Linnaean Herbarium and this specimen is considered to represent the type.

Found in tropical and subtropical Africa, extending to north west India; introduced elsewhere in the tropics.

Recorded from the following districts: *South West Africa*: wide-spread except in the drier areas along the west coast, recorded from as far south as Gibeon and Rehoboth; *Bechuanaland Protectorate*; *Transvaal*: Soutpansberg, Sibasa, Pietersburg, Potgietersrust, Waterberg, Rustenburg, Warmbaths, Pretoria, Brits, Bronkhorstspuit, Marico, Lichtenburg, Potchefstroom, Wolmaransstad, Nelspruit, Barberton; *Cape Province*: Namaqualand near the Orange River (*Drege*), Prieska, Vryburg, Mafeking; *Orange Free State*: Hoopstad; *Natal*: Lower Tugela, Estcourt, Weenen, Lions River.

The following specimens are noteworthy: a specimen leg. *Drege* at "Verleptpram" near the Orange River in North-west Namaqualand (L, PRE,) labelled "*Momordica gariepensis* E. Mey." South West Africa, Unkuambi (Ovamboland), *Rautanen* 491, 686 (Z); Rehoboth, *Schinz* 310 (GRA, Z); Oshiheke, *Schinz* 311 (BR, Z); Okahandja, *Dinter* 330 (GRA, L, SAM, Z), and sine loco, *Fleck* 7a and 161 (Z). Transvaal, Phoberg, *Holub* (Z)—all these numbers cited by Cogniaux (1924) under *M. schinzii* Cogn. of which *Schinz* 310 and 311 in (Z) are the syntypes. Transvaal, "Vaal River" and "Magaliesberg" *Burke* 81 (PRE, SAM), *Zeyher* 595 (SAM), both cited in *Flora Capensis* and by Burt Davy as *M. balsamina*.

Momordica schinzii is inseparable from *M. balsamina*, the distinguishing character indicated by Cogniaux (1924), i.e. male bracts entire or dentate, is useless.

5. *M. involucrata* E. Mey. ex Sond. in Fl. Cap. 2: 491 (1862); Cogn., Mon. Cucurb. 440 (1881); Pflanzenreich 275.2: 30 (1924); Curtis, Bot. Mag. t. 6932 (1887); Wood, Natal Pl. 6: t. 516 (1909). Type: *Drege* s.n. from Durban in Herb. Sonder (S, holo., L, iso.).

M. balsamina L. var. *leucantha* Ch. Huber, Cat. 6 (1864), nomen. *M. huberi* Tod. in Giorn. R. Inst. Agric. Sicilia 165 (1863). *M. balsamina* L. var. *huberi* Naud. in Ann. Sci. Nat. 5 me sér. 5: 21 (1867).

Perennial monoecious herbaceous climber. *Stems* rather slender, glabrous or nearly so, up to several meters long. *Leaves* in outline cordate-suborbicular to pentagonal, 3–5-lobed to about the middle with obovate or subrhomboid and usually long-mucronate to apiculate lobes, dark green above; slightly lighter below, drying deep-green to dark brown on both surfaces, glabrous or nearly so, smooth, 3–6 (–9) cm long and broad; lobes with usually distinctly constricted base, dentate-lobulate with 3–5 or occasionally up to 9 teeth or lobes, rarely only remotely callosa-dentate; the lowermost leaf-segments always much smaller than the other ones; petioles thinly pubescent to glabrous, 1–4 cm long. *Tendrils* simple. *Male flowers* solitary; peduncles filiform, usually glabrous below and thinly pubescent towards the apex, 3–7 cm long, bracteate at the apex by a sessile, broadly reniform-cordate sub-entire, usually emarginate and mucronate subglabrous ciliate bract 8–12 mm long and 12–20 mm broad; receptacle and sometimes the sepals blackish, the first 3–7 mm long and 6–10 mm wide at the mouth, the latter ovate-sub-orbicular, obtuse to rounded sometimes acuminate or abruptly apiculate-aristate by an up to 3 mm long apiculus, glabrous or puberulous, 5–10 mm long and 3–8 mm broad near the base; corolla white or pale cream, green-veined with 3 dark blotches on base of longer petals inside, asymmetrical; the lobes obovate or sub-orbicular-obovate, 15–24 mm long, the two large ones 12–13 mm broad, the other 3, 8–10 mm broad. *Female flowers* solitary on a 3–4 cm long pedicel which is bracteate near the base; sepals triangular or elliptic-lanceolate acute, 2–3 mm long; corolla usually smaller than in the male flower but occasionally up to 21 mm long; ovary oblong fusiform, rostrate verrucose. *Fruit* orange-red when ripe, ovoid sub-globose often somewhat angular (hexa- or octogonal), apiculate, with some conical protuberances, dehiscent, 3–5 cm long, 2–3 cm in diam. *Seeds* brown, compressed, on the flat faces finely pitted-grooved as if corroded, 9–11 mm by 5.5–7 by 1.5–2 mm.

CAPE PROVINCE.—Komgha: Kei Mouth, *Flanagan* 165 = 1464 in Herb. MacOwan (GRA, PRE, NBG). Kentani: Mazeppa Bay, *Theron* 12 (PRE). Port St. Johns: *Mogg* s.n. (PRE).

NATAL.—Umzinto: Ifafa coastal bush, *Handley* 56 (NU); Scottburgh, *Mauve* 1005 (PRE); Umkomaas, *Gilmore* Hb. no. 20952 (NH). Pinetown: Winkle Spruit, *Lansdell* s.n. (NH, PRE); Doonside, *Wylie* Hb. No. 23307 (NH). Durban: Isipingo Beach, *Ward* 729 (NU, PRE); 730 (NU); *Forbes & Obermeyer* 54 (NH, PRE); “Umlaas Height”, *Drege* s.n. (L. iso!). Durban, *Krauss* 90 (PRE); *Rehmann* 8841 (BR); *Schlechter* 2796 (GRA); *Wood* 130 (BOL, GRA, NBG, NH); 655 (NH); 3093 (BOL); *Barker* 3564 (NBG); Berea, *Wood* 11093 (NH, PRE); 11386 (J, NH, NU, PRE); *Forbes* 42 (NH); *Pillans* s.n. (NBG). Inanda: *Wood* s.n. (GRA). Lions River: Howick, *Shafton* 109 (GRA). Mtunzini: Tugela Beach, *Johnson* 372 (NBG). Lower Umfolozi: Umsundusi River, *Gerstner* Hb. No. 23015 (NH). Hlabisa: False Bay, *Gerstner* 4724; 4725; 4726 (PRE); E. of Nyalazi River, *Ward* 3043 (NH, NU, PRE); St. Lucia, *Lansdell* 72 (NH). Ubombo: Mkuzi, *Galpin* 13327 (PRE). Ingwavuma: Ngamini Pan, *Gerstner* 3406 (NH), 3466 (NH, PRE).

Also in the coastal areas of the southern part of Portuguese East Africa.

Apparently a species with ecological requirements altogether different from *M. balsamina*, the latter being a species of bushveld (savannah) vegetation, generally occurring over 1,500 ft. altitude, and *M. involucrata* a species restricted to the coastal bush and not going far inland.

6. *M. charantia* L., Sp. Pl. ed. 1: 1009 (1753); see Cogn., Pflanzenreich 24 (1924), for full synonymy.

This plant, which is wide-spread in tropical Africa, apparently does not occur in a wild state in the area considered in the present paper. The few specimens of the species seen (from Natal) are obviously escapes from vegetable gardens of Indians who use this plant in their curries (some of the field-notes even suggest this source, e.g. on a specimen leg. *Gerstner* from Umzinto). The specimen *Höpfner* 99 from Damaraland cited by Cogniaux under *M. charantia* var. *abbreviata* Ser. I have not seen, but it is doubtful if this was correctly named. The only species of *Momordia* I have seen from South West Africa is *M. balsamina* (*M. schinzii*). There are no Indian settlements in South West Africa nor were there any in Höpfner's time, and as far as can be ascertained *M. charantia* has never been cultivated in South West Africa, so that Höpfner's specimen cannot have been a garden escape. It is more likely that this specimen belongs to *M. balsamina*. At any rate, *M. charantia* is not considered to be an indigenous element of our South African flora.

7. *M. repens* *Bremek.* in Ann. Transv. Mus. 15: 261 (1933). Type: *Bremekamp & Schweickerdt* 34 (PRE, holo!).
M. marlothii Harms in Fedde, Repert. 36: 269 (1934).

Perennial, monoecious, prostrate or occasionally scandent herb. *Stems* up to about 2 m long, firm and usually rather stout, in sicco deeply sulcate, more or less densely covered with a pubescence of rather short pilose to hirsute hairs; internodes usually 3–5 cm long. *Tendrils* bifid at the apex when mature pubescent like the stems, the basal undivided portion usually rather firm, sulcate, the apical branches filiform, usually slender. *Leaves* herbaceous, when fresh slightly fleshy, drying papery to a peculiar yellowish green or a pale olive-green, reniform-orbicular in outline, 3–7 cm in diam., usually more or less deeply lobed and the lobes again lobulate (the lobules acute or obtuse, mucronulate); basal sinus deep (usually about half the length of the leaf); both surfaces scabrid or shortly setose-scabrid, the margin ciliate; petioles terete, densely pubescent, striate, 2–6 cm long. *Male flowers* solitary or occasionally in few-flowered subumbellate cymes; peduncle densely pubescent, striate, up to about 6 cm

long, with a subreniform, more or less 3- or 5-lobed, 6–9 mm long and 9–14 mm wide, rarely small, subcordate bract near the middle in solitary flowers and at the apex if flowers racemose; pedicels resembling the peduncle but usually more slender, up to 3.5 cm long; receptacle pubescent, short, about 8 mm in diam.; sepals ovate or oblong, pubescent, dark, lighter towards margins and apex, apiculate, 7–10 mm long and 4–5 mm wide; petals pale yellow, dark veined, broadly ovate or obovate, 2–3 cm long, pubescent. *Female flowers* solitary; peduncles rather stout, 3–7 cm long, in the middle with a bract like the male peduncles or ebracteate; ovary rostrate from an ellipsoid or ovoid-fusiform basal portion, densely and shortly pubescent and in widest portion muricate, 15–25 mm long; corolla often larger than in the male, up to 35 mm long. *Fruit* subglobose or somewhat ellipsoid or depressed, rostrate, muricate with large flattened acutish protuberances and with 10 raised ribs, apparently indehiscent, reddish-brown when ripe, 4–7 cm in diam. and 5–6 cm long; rostrum up to 1 cm long. *Seeds* pale, yellowish, orbicular in outline, compressed with flat, or concave, convex or irregularly bulging sides and 2 parallel peripheral, usually irregularly sinous, angular or incised, ridges, about 20 mm in diam. and 7–8 mm thick; testa hard and bony.

Endemic in Southern Africa.

BECHUANALAND PROTECTORATE.—Palapye, *Marloth* 3329 (isotype of *Momordica marlothii* Harms, PRE); Mahalapye, *Mansergh* Hb. No. 25586 (BOL); Mochudi, *Harbor* in H. Rogers no. 6512 (BOL); nr. Derdepoort (Transvaal border), *Codd* 8883 (PRE). TRANSVAAL.—Rustenburg: Matlabas River, 5 miles S. of Limpopo, *Mogg* 24584 (J, PRE); near Makoppa, *Codd* 8649 (PRE); near Thabazimbi, *Principal of Potchefstroom Agr. College* (cultivated at Prinshof, Pretoria, PRE). 40 miles N.W. of Thabazimbi, *Story* 6048 (PRE). Waterberg district: near Monte Christo, *Codd* 6597 (PRE); 12 miles E. of Ellisras, *Meeuse & Strey* 10450 (PRE). Potgietersrust: nr. Potgietersrust, Leendertz Hb. No. 6016; 6568 (not 6068 as cited by Bremekamp; PRE); *Rogers* 1316 (GRA); *Thode* A 1703 (PRE, NH); *Maguire* 1297 (NBG); *Meeuse* 9458 (PRE). Pietersburg: Brakrivier, *Bremekamp & Schweickerdt* 34 (PRE, type!); Magalakwin River, Salt Lake, *Hutchinson* 2655 (PRE). Bronkhorstspuit: farm Rooikop, *Smuts & Gillett* 3031 (PRE). Without precise locality: "Lekker Kraal" (most probably Transvaal), *P. Krantz* Hb. No. 8217 (PRE); N. Transvaal: *Pole Evans* 2522 (PRE).

The fact that this rather striking plant has remained undescribed for such a long time can be explained only by its relatively small area of distribution and its ecological requirements (deep dry sandy soil) so that, although often locally frequent, it is not very common.

10. ACANTHOSICYOS

Acanthosicyos Welw. ex Hook. f. in Benth & Hook., f., Gen. Pl. 1: 824 (1867); Welw., Sert. Angol. in Trans. Linn. Soc. 27: 30 (1869); Hook. f. in Fl. Trop. Afr. 2: 531 (1871); Cogn., Mon. Cucurb. 418 (1881); Pflanzenreich 275.2: 4 (1924); Baill., Hist. Pl. 8: 442 (1886); Pax in Pflanzenfam. 4, 5: 23 (1889); Phillips, Gen. ed. 2: 747 (1951).

Perennial erect or ascending rigid shrub, much branched from the base. *Leaves* reduced to minute scales. *Tendrils* 0. *Spines* paired at the nodes. *Flowers* dioecious, sessile or subsessile. *Male plants*: flowers fasciculate or solitary; receptacle wide; sepals firm, often unequal, petals rather coriaceous, broadly ovate; stamens 3 or 5, inserted in the mouth of the receptacle; filaments short and thick; anthers broad, one 1-locular and two 2-locular or all 1-locular; thecae strongly flexuous; connective

dilated, not produced at the apex; rudimentary pistil rarely present. *Female plants*: flowers solitary; perianth as in the male; staminodes 5, elongate; ovary ovoid with 3–5 placentas; ovules numerous, horizontal; style columnar with 3–5 2-horned, flat or capitate stigmas. *Fruit* subglobose, indehiscent, many-seeded, covered with hemispherical conical spine-tipped protuberances. *Seeds* oblong or ovate in outline, not much compressed, immarginate, testa smooth, thick, hard.

Type species: Monotypic.

Found in the dry sandy desert area near the coasts of southern Angola (Mossamedes) southwards to both banks of the Orange River and north-western Namaqualand.

A. horrida *Welw. ex Hook. f.*, l.c. (1867); Sert. Angol. 31, t. 11, 11a (1869); Hook. f., l.c. (1871); Cogn., op. cit. 419 (1881); 6 (1924); Marloth in Bot. Jahrb. 9: 173, t. 3 (1887); Flora of S. Afr. 3, 2: 205, f. 88–91, Pl. 53, f. A (1932); Engl. in Bot. Jahrb. 19: 151 (1891); Hiern, Cat. Welw. Afr. Pl. 1, 2: 392 (1898); Dinter in Fedde, Repert. 15: 81 (1917); Fedde, Repert. Beih. 3: 84, 86 (1921); Range in Fedde, Rep. 30, t. 129 (1932); 38: 272 (1935). Type: *Welwitsch* 806 (BM, holo., COI, iso!).

Shrubby, 0.5–1 m tall, forming dense and large bushes on small dunes which the plant builds up itself. *Rootstock* woody. *Stems* robust, terete, pale yellowish or glaucous to greyish green, sulcate; twigs subvirgate, pubescent in the youngest parts, the floriferous ones subtomentose. *Spines* terete, straight or nearly so, 2–3 cm long, glabrous. *Male flowers* greyish-tomentose outside; sepals ovate to suborbicular-obcordate, 4–6 mm long; petals furfuraceous inside, 10–12 mm long, pale yellow. *Female flowers*: peduncle in fruit incrassate, ultimately attaining a length of about 1 cm; staminodes erect, linear, dilated near the apex, 5–7 mm long; ovary 15–17 mm long, densely covered with puberulous oblong-conical soft 2–2.5 mm long spines; style 9–10 mm long, stigma 6–7 mm wide. *Fruit* pale orange-yellow when ripe, with orange-yellow pulp, up to about 20 cm in diam. *Seeds* nearly white, sub-obliquely truncate near the base, 14–15 mm long, 9–11 mm wide, 6–7 mm thick.

ANGOLA.—Mossamedes: coastal dunes between Porto de Pinda and Banza de Caroca, *Welwitsch* 806 (COI, isotype!); Rio Coroca, *Capello & Ivans* 4 (COI); Cumilunga, *Exell & Mendonça* 2225 (COI); Mossamedes, *Lapa & Faro* s.n. (COI); Tiger Bay (Bahia dos Tigros), *Newton* s.n. (COI).

SOUTH WEST AFRICA.—Kaokoveld: Namib near Sarasas, *Hall* 408 (NBG). Swakopmund and surrounding area: *Dinter* 2806 (PRE, SAM); *Moss* 17895 (J); *Bradfield* 466 (PRE); *Wiss* 956 (PRE); Walvis Bay, *Marloth* 1179 (BOL, BR, GRA, L, PRE, SAM); *Cleverly* in Herb. MacOwen 1462 (GRA, PRE, SAM); *Galpin & Pearson* 7450; 7462; 7472 (PRE); *Pole Evans* Hb. no. 19333 (PRE), *Rodin* 2136 (BOL, PRE) no. 2231 in herb. Strey (PRE), *Jensen* s.n. (PRE, a beautiful fasciation), *Chaplin* s.n. (NBG), *de Winter* 3183 (PRE), *Merxmueller & Giess* 1748 (PRE, M). “Kuiseb” near Walvis Bay, *Strey* “82”, 2583 (PRE). Luederitzbucht: Kavis Mtns., *Dinter* s.n. (SAM), 6674 (B, BOL, PRE, SAM); Orange River, N. side, 1.5 miles from mouth, *Pillans* 5605 (BOL, PRE); Daberas Drift (on both banks), *Range* 1569 (SAM).

CAPE PROVINCE.—Richtersveld: Daberas Drift: *Range* 1569 (SAM), see above. Namaqualand: nr. Aughrabies, 15 miles E. of Port Nolloth, *Marloth* s.n. (PRE).

The first record of this plant is from Alexander in Exp. of Discovery, p. 271, t. 2 (1837) who mentioned its use as a food plant and figures a fruit. The first valid botanical description was published 30 years later. The ~~ripe~~ fruits are edible when ripe, but bitter and unpalatable when still green. The seeds contain a considerable quantity of fat and are exported in large quantities to Cape Town. They are an excellent substitute for almonds.

Acanthosicyos horrida is an example of extreme adaptation to a life on the dry sand-dunes (which it builds up itself by catching the sand and emerging every time it is covered by the sand) of the Namib desert with its extreme climatic conditions. The xerophytic habit (reduced leaves, spines, leathery perianth, etc.), the peculiar shrubby growth and the absence of tendrils are unusual among Cucurbitaceae.

As regards the citation of the specific name, in Bentham and Hooker, *Genera Plantarum*, only a description of the genus is given, but this is a "genero-specific" description because only a single species is mentioned. The species was, therefore, also validly published in *Genera Plantarum* and has to be cited as "*A. horrida* Welw. ex Hook. f. (1867)".

11. CITRULLUS

Citrullus Schrad. in Eckl. & Zeyh., Enum. Pl. Afr. Austr. 2: 279 (1836), nom. cons.; Forsk., Fl. Aeg.-Arab. 167 (1775), nomen nudum; E. & Z. in Linnaea 12: 412 (1838); Naud. in Ann. Sci. Nat. 4me. sér. 12: 99 (1859); Sond. in Fl. Cap. 2: 493 (1862); Benth. & Hook. f., Gen. Pl. 1: 826 (1867); Hook. f. in Fl. Trop. Afr. 2: 548 (1871); Cogn., Mon. Cucurb. 507 (1881); Pflanzenreich 275.2: 102 (1924); Pax in Pflanzenfam. 4, 5: 27 (1889); Phillips, Gen. ed. 2: 749 (1951); Taxon 10: 125 (1961). *Colocynthis* Mill., Gard. Dict. Abridg., ed. 4: 1 (1754); Kuntze, Rev. Gen. 1: 256 (1891); Post & Kuntze, Lexicon 136 (1904), as "*Colocynthis* L. (1753)"; Exell, Cat. Vasc. Pl. S. Tome, Suppl. 21 (1956); Taxon 5: 38 (1956).

Type species: *C. vulgaris* Schrad.

Prostrate annuals or perennials with herbaceous or sometimes more or less woody stems, often with a musk scent or foetid. *Leaves* orbicular to triangular-ovate in outline, always deeply 3-5-lobed with lobulate to pinnatisect lobes. *Tendrils* 2- or 3-fid, or sometimes simple, in one species absent, in one species straight, spinescent. *Flowers* monoecious or dioecious, medium-sized, on short pedicels. *Male flowers* solitary, rarely fasciculate; receptacle broadly campanulate; sepals narrow, remote; corolla yellow or pale yellow, rotate or shallowly campanulate, segments nearly free, ovate-oblong, obtuse; stamens 3, inserted near the base of the receptacle; filaments short, free; anthers free or somewhat cohering, one 1-theous and two 2-theous with linear, sigmoid or conduplicate thecae; connective dilated but not produced into an apical appendage; rudiment of ovary glandlike. *Female flowers* solitary; calyx and corolla as in the male; staminodes 3, short, setiform or ligulate; ovary ovoid to subglobose, smooth or with soft protuberances; placentas 3; ovules numerous, horizontal; style short, columnar, not surrounded by a disc at the base; stigmas 3, thick, reniform, sub-bilobed. *Fruit* globose to oblong, with a soft to firm or rather hard pericarp and a usually softer pulp containing the numerous seeds, indehiscent. *Seeds* ovate to oblong in outline, much compressed, white- or dark-coloured; testa hard, tegmen membranous; cotyledons oblong to obovate; radicle conical, subacute.

A genus of 4 species, distributed from the Mediterranean area to India and Ceylon and throughout the greater part of Africa, extending into the Cape Province.

The name *Citrullus* Schrad. has been proposed and accepted for conservation by the Paris Congress. The relevant information does not consider *Colocynthis* Mill. (1754) and that is why Exell (see Taxon 5, 1: 38) has stated that: "this conservation should be reconsidered with full knowledge of the facts". There is no strong argument in favour of conservation of *Citrullus* Schrad. (1836) against *Colocynthis* Mill.; the latter name clearly antedates the first and is unambiguous and has, moreover consistently been used in several recent floras (see the citations under *Colocynthis citrullus* below). It is true that some authors do not use *Colocynthis* "Mill." but "Tournef." "L.", "Haller" or "Ludw." as the author, but as the same genus is intended there is no difficulty. The necessary combinations in *Colocynthis* have all been made and there

is no advantage in taking up *Citrullus*, except (see Taxon 2: 99, 134; 4: 198; 5: 15) as an argument to retain the name frequently used for the water-melon in agricultural and horticultural circles, i.e., *Citrullus vulgaris* Schrad. This name is untenable because it is illegitimate and, in *Citrullus*, would have to be replaced by a new combination based on *Momordica lanata* Thunb. In *Colocynthis*, the legitimate name is *C. citrullus* (L.) Kuntze, which retains the name "Citrullus" as the epithet. However, conservation of *Citrullus* was confirmed in Taxon 10: 125 (1961).

The genus can be divided into two subgenera which differ in the fruits (smooth in subgenus *Citrullus* and tubercled in the subgenus *Pseudocucumis*), in the tendrils (soft and coiled or wanting in *Citrullus*, straight and spinescent in *Pseudocucumis*) and in the chemical composition of the bitter substances found in the fruits (see Enslin *et al.*).

***Citrullus* Schrad. subgen. *Citrullus*:** Monoecious, tendrils coiled or absent, fruit smooth. Contains all species except *C. naudinianus*.

***Citrullus* Schrad. subgen. *Pseudocucumis* A. Meeuse subgen. nov.**—Dioicus, cirrhi rigidi, spinescentes, pepo tuberculatum. Type: *C. naudinianus* (Sond.) Hook. f.

Tendrils present, sometimes straight, spinescent:

Tendrils reduced to straight spines; flowers dioecious; ovary and fruit with protuberances

1. *C. naudinianus*

Tendrils well-developed, usually 2- or 3-fid; flowers monoecious; ovary and fruit smooth

2. *C. lanatus*

Tendrils wanting..... 3. *C. ecirrhosus*

1. ***C. naudinianus* (Sond.) Hook. f.** in Fl. Trop. Afr. 2: 549 (1871); Cogn., Mon. Cucurb. 511 (1881); Verh. Bot. Ver. Brandenb. 30: 150 (1888); Pflanzenreich 275.2: 114 (1924); N.E. Br. in Kew Bull. 1909: 112 (1909); Burt Davy, Fl. Transv. 1:230 (1926).

Cucumis naudinianus Sond. in Fl. Cap. 2: 496 (1862). *C. dissectifolius* Naud. in Ann. Sci. Nat. 4me. ser. 11: 23 (1859), ex parte.

Colocynthis naudinianus (Sond.) Kuntze, Rev. Gen. 1: 256 (1891).

Type: When Naudin described *Cucumis dissectifolius* he cited a specimen collected by Ward near Grahamstown and the Burke gatherings 276 and 488 from Mooi River (Potchefstroom), all in herb. Hooker (now in K). Sonder referred Burke 276 to *Cucumis dissectifolius* and Burke 488 to *Cucumis naudinianus*. The Ward specimen was not mentioned, but from the locality alone it can be safely concluded that it does not belong to Sonder's *C. naudinianus*. Cogniaux stated that "Burke 488" partim belongs to *C. naudinianus* but referred Burke 276 and the Ward specimen to *C. dissectifolius*. Accordingly, the holotype of *C. naudinianus* is Burke 488, at least that part that agrees with the description given by Sonder, in Herb. Hooker (K.). A duplicate of Burke 488 in SAM represents this species and is clearly an isotype.

Perennial herb. *Root* tuberous, long fusiform-cylindric, up to about 1 m long and 8 cm in diam. *Stems* prostrate, several from the crown of the root, up to 3 cm long, rooting at the nodes, often branched, usually firm, angular-sulcate, originally sub-hirsute, shortly pubescent, glabrescent. *Tendrils* short, straight or slightly curved at the apex, rigid and spinescent, glabrescent up to 3.5 cm rarely up to 7 cm long. *Leaves* secund, rigid, deeply palmatifid, scabrid above, often setose along the main nerves, setose (mainly on the veins) below, or scabrid on both sides, 3–8 cm, rarely up to 14 cm, long and 2–6 cm, rarely up to 12 cm, wide; lobes 5, all more or less irregularly and lyrate lobed, usually acute, the middle lobe the longest, the lateral ones smaller, the lowermost much smaller, often with a lobule or sub-bilobed, all lobes and their secondary lobes entire to dentate or lobed, midribs rather conspicuous and, like the petiole, often brownish, purplish or reddish; petioles shortly setose-hispid, turning scabrous, 0.5–4

cm, rarely up to 7 cm, long. *Flowers* dioecious, solitary; receptacle cup-shaped to shortly campanulate, 5–6 mm long, 7–8 mm in diam., shortly hispid like the linear-lanceolate, subacute or obtuse, 6–7 mm long and about 1.5 mm wide sepals; petals light yellow, ovate-elliptic, subacute, strongly veined, shortly hispid-pubescent, 1.5–2 cm long and 0.8–1 cm wide. *Male flowers*: pedicels 0.5–2 cm long, hispidulous, filament dorso-laterally flattened, widening at the base, 4–5 mm long; anthers subquadrate-orbicular, 4–5 by 4–5 mm; connective very broad and flattened. *Female flowers*: pedicels longer than in the male, 3–8 cm long; ovary ellipsoid to ellipsoid-fusiform, 12–15 mm long, covered with thick short soft conical spines tipped by short setae; staminodes ligulate or cylindrical-setaceous, small. *Fruit* ellipsoid, greenish yellow or somewhat greyish light green, covered with large blunt conical spines, 6–12 cm long and 4–8 cm in diam. *Seeds* white, smooth, 7.5–10 mm long, 4–6 mm broad and about 3 mm thick.

From southern Angola and Barotseland (Northern Rhodesia) to South West Africa, Griqualand West and the northern and western Transvaal, also recorded from the Matopos (Bulawayo distr.) in Southern Rhodesia and from Portuguese East Africa.

Recorded from the following districts: *South West Africa*: Ovamboland, Okavango, Grootfontein, Okahandja, Gobabis, Otjiwarongo, Windhoek, Gibeon; *Bechuanaland Protectorate*: widespread and common in many places; *Cape Province*: Gordonia, Kuchuman, Barkly West, Mafeking, Postmasburg, Vryburg, Kimberley; *Transvaal*: Lichtenburg, Ventersdorp, Potchefstroom, Pretoria, Warmbaths, Waterberg, Potgietersrust, Soutpansberg, Sibasa, Rustenburg; *Orange Free State*: Hoopstad, Boshoff; *Portuguese East Africa*: Lourenço Marques.

The following specimens are of special interest:

SOUTH WEST AFRICA.—Okahandja: *Dinter* 308 (COI, GRA, L, SAM). Gibeon: near Kalkfontein, *Range* 1383 (SAM). Gobabis: *Range* 780 (SAM), all cited by Cogniaux (1924).

BECHUANALAND.—Kwebe Hills, *Lugard* 155 (GRA), cited by N. E. Brown (1909).

TRANSVAAL.—Potchefstroom: Mooi River, *Burke* 488 (K, holo, PRE, photo of holo.!, SAM, iso.!). Potgietersrust: near Grass Valley (“Klippan”), *Rehmann* 5171 (BR, cited by Cogniaux 1924 and by Burt Davy).

PORTUGUESE EAST AFRICA.—Sul do Save: Lourenço Marques, *Schlechter* 11672 (BOL, BR, COI, GRA, L), cited by Cogniaux 1924.

SOUTHERN RHODESIA.—Bulawayo: *Rogers* 5739 p.p.; 5747 (BOL).

NORTHERN RHODESIA.—Barotseland: *Watt & Brandwyk*, 345; *Setula*, *Borle* 257 (PRE).

ANGOLA.—Kuando, near Santa Cruz Mission, *Codd* 7551 (PRE); R. Kunzumbra, *Pocock* 525 (BOL).

This species is a typical Kalahari species which prefers deep sandy soil. In Bechuanaland the fruits are eaten on a large scale, raw or roasted, but occasionally specimens with bitter fruits are encountered. The bitter substances in these fruits when chemically analysed show a composition similar to those found in species of *Cucumis* and altogether different from those in species of *Citrullus* sect. *Citrullus*. The simple spine-like tendrils, tuberculate fruits and the chemical composition of the bitter substances in the fruit of *Citrullus naudinianus* clearly indicate a close relationship to *Cucumis*, but in its floral characters (no apical appendages of the connective; rudimentary ovary in the male flowers; style without a disc at the base in the female flowers) it is clearly a species of *Citrullus*, so that this species forms a link between these two genera. The best solution seems to be the retention of the true species of *Citrullus* as the section *Citrullus* and the inclusion of *C. naudinianus* in a separate section *Pseudocucumis*. The alternative, a complete reduction of *Citrullus* to *Cucumis*, would certainly cause inconvenience and would not improve matters.

2. *C. lanatus* (Thunb.) Mansf. in Kulturpfl. Beih. 2: 421 (1959).
Momordica lanata Thunb., Prodr. Pl. Cap. 13 (1794). Type: in Herb. Thunberg, Uppsala.
Cucurbita citrullus L., Sp. Pl. ed. 1: 1010 (1753). *C. anguria* Duch. in Lam., Encycl. 158 (1786), nom. illeg.
Citrullus battich Forsk., Fl. Aeg.-Arab. 167 (1775). *C. vulgaris* Schrad. apud Eckl. & Zeyh., Enum. 279 (1836); Linnaea 12: 412 (1838); Naud. in Ann. Sci. Nat. 4me. ser. 12: 100 (1859); Sond. in Fl. Cap. 2: 494 (1862); Hook. f. in Fl. Trop. Afr. 2: 549 (1871); Cogn., Mon. Cucurb. 508 (1881); Pflanzenreich 275.2: 103 (1924); Burt Davy, Fl. Transv. 1: 229 (1926). *C. amarus* Schrad. in Linnaea 12: 413 (1838): 19: 651 (1845).
Colocynthis citrullus (L.) Kuntze, Rev. Gen. 1: 256 (1891); Exell, Vasc. Pl. S. Tomé 185 (1944); Andrews, Fl. Anglo-Eg. Soudan 1: 168 (1950); Keay, Fl. W. Trop. Afr. ed. 2, 1: 213 (1954). Hiern, Cat. Afr. Pl. Welw. 1: 397 (1898), sphalm. "*C. amarissimus*" (for full synonymy, cf. Cogniaux 1924).

A prostrate monoecious annual, producing several herbaceous, rather firm and stout stems up to 3 m long. Young parts more or less densely lanate-villous (with curved hairs), older parts glabrescent. *Leaves* ovate or triangular-ovate in outline, cordate at the base, herbaceous but rigid, soon somewhat scabrous on both sides, 6–20 cm long and 4–15 cm broad, deeply trifid with lobulate to pinnatilobed, obovate, oblong or linear to lanceolate segments of which the central one is always the longest and usually acute or acuminate; the lateral ones usually rounded to obtuse at the apex often more or less bilobed; petioles usually with some curved hairs, 4–12 cm long. *Tendrils* rather robust, usually bifid, pubescent especially towards the apex at least when young. *Male flowers*: peduncle usually elongate, villous; receptacle broadly campanulate, villous; sepals about as long as the receptacle; corolla usually greenish on the outside, pale yellow inside, up to 3 cm in diam. *Female flowers*: ovary lanate; style 4–5 mm long. *Fruit* in the wild form globose (3–) 6–20 cm in diam., in the cultivated forms globose to ellipsoid or oblong and up to 60 cm long and 30 cm in diam., soon quite glabrous and smooth; the pericarp hard but not woody, in the wild forms pale green or greyish green usually mottled with longitudinal irregular bands of dark green or dark greyish green, in cultivated forms often concolorous, very pale green to dark green or yellowish, or mottled with darker green; or marmored with a darker shade; the flesh in the wild form and some cultivated forms (citron-watermelon) used for preserve, firm and rather hard, almost invariably white, in cultivated forms somewhat spongy in texture but very juicy and soft, usually pink or bright reddish-pink. *Seeds* usually very numerous, in wild forms black or dark brown as a rule; in cultivated forms also white or mottled, varying in size but usually 6–12 mm long.

An old cultigen cultivated and in a semi-wild state in the warmer parts of the whole world, but truly native most probably only in the more or less sandy drier areas of Southern Africa, chiefly in the area of the so-called Kalahari desert. The cited specimens were all growing wild or were apparently wild.

SOUTH WEST AFRICA.—Okavango: Diyona near Nyangana, *de Winter & Marais* 4613. Karibib: Usakos–Otjimbingue, *Marloth* 1281. Okahandja: *Dinter* 127; Quickborn, *Bradfield* 200, 201. Otjiwarongo: Waterberg, *Volk* 1098; *Boss* s.n. Gobabis: *de Winter* 2488. Windhoek: Avisdamm, *Liebenberg* 4464. Marienthal: *Dinter* 2024. BECHUANALAND.—Ngamiland, *Curson* 177; Molepole, *Storv* 4937; 4999; Kaotwe, *Van Son* in T.M. 28802; between Kuke and Gomodimo, *Van Son* in T.M. 28794. CAPE PROVINCE.—Little Namaqualand: Richtersveld, Sendlingsdrift, *Herre* s.n. in Hb. Marloth. Gordonias: 12 miles N. of Witkop, *Pole Evans* 2146. Calvinia: *Schmidt* 500. Prieska: *Bryant* J 283. Kuruman: *Marloth* 1137. Vryburg: Armoedsvlakte, *Henrici* 116; *Foley* s.n. Kimberley: Vaal River, *Marloth* 825. Middelburg: Grootfontein, *Verdoorn* s.n.; *Theron* 593. Albany: near Grahamstown, *Schönland* 4357.

TRANSVAAL.—Soutpansberg: near Saltpan, Smit s.n.; Schweickerdt & Verdoorn 455. Potgietersrust: Zebediela, Quin s.n. Waterberg: Mosdene, near Naboomspruit, Galpin M 135; M 139. Warmbaths: Leendertz s.n. Brits: Welgevonden, Mogg s.n. Pretoria: Chippindall 117; Fountains Valley, Verdoorn 746. Wolmaransstad: Strydpoort, Sutton 240. Potchefstroom: 7 miles E. of Rysmierbult, Louw 1382. Johannesburg: Turffontein, Bryant D 91. Bronkhorstspuit: Rooikop Farm, Smuts & Gillett 2020; 2078. Heidelberg: Uitgevallen 197, Burt Davy 13676. Middelburg: King "G". Nelspruit: Kruger National Park, Pretoriuskop, van der Schijff 2416.

The original (pre-Linnaean and Linnaean) descriptions of this plant refer to cultivated forms, as the wild forms became known to botanists at a much later date. Many varietal names for the cultivated forms have been proposed (see e.g., Harms in *Pflanzenreich* 275.2: 107–108 and also *Kew Bull.*, Add. Ser. 9, 2: 366, 1911) but to my mind one should regard all forms as one species, because some cultivated forms (such as the "citron water melon" with very firm fruit pulp) are so close to the wild "Tsamma" of the Kalahari that one cannot draw a line anywhere to separate them. Experiments by Dr. S. Rehm of the Horticultural Research Station, Pretoria, in which he crossed the wild form and cultivars prove that the wild and cultivated water melons behave completely as if they are one and the same species, producing completely fertile progeny for several generations. Spontaneous "hybrids" between cultivated water-melons and wild or semi-wild forms have been sent in by farmers several times. It cannot be denied that there are several distinct "types" or "forms", differing in fruit size, colour of fruit, skin and pulp (red, pink, white or yellow), colour and size of seeds, etc., but they are to be classified as "cultivars".

The wild "Tsamma" occurs in two biochemically different forms, the one without the bitter cucurbitacin E-glucoside (elaterinid), which provides food and water for the Bushmen in the semi-arid regions of the Kalahari, and the other with elaterinid. Bitter specimens of cultivated water-melons occasionally appear spontaneously in the fields (the bitter substance is again elaterinid in this case), but these are constant (homozygous for "bitter") and must be mutants; these genetically constant, bitter variants must not be confused with the crosses between cultivated water-melons and bitter wild Tsammas which segregate in the F_2 into bitter and non-bitter forms.

The bitter Tsammas have caused confusion with the bitter *Colocynthis vulgaris* (colocynth or bitter apple). Reports on the occurrence of the true colocynth in Southern Africa are, therefore, suspect. I have not seen any specimens that are referable to *C. vulgaris* from the area covered by this revision.

3. *C. ecirrhosus* Cogn. in Schinz in Verh. Bot. Ver. Brandenb. 30: 151 (1888); Bot. Jahrb. 10: 270 (1888); *Pflanzenreich* 275.2: 115 (1924); Dinter in Fedde, Repert. 15: 432 (1919). Type: *Luederitz* 136 (Z, lecto!), see below. *Colocynthis ecirrhosus* (Cogn.) Chakrav. in Sci. & Cult. 15: 32 (1949).

Monoecious prostrate perennial with woody rootstock. *Stems* several to many fairly slender to stout, canescent, not much branched, in the young parts puberulous to shortly hispid, later glabrous, usually scabrid, up to at least 2 m long. *Leaves* rigid and fragile, ovate to broadly suborbicular in outline, with strongly recurved margins, canescent, usually glabrous, rather smooth above, except on the shortly setose-hispid main nerves, at first shortly setose-scabrid, later callous-scabrid and white-punctate mainly near the margins below, 2–6 cm in diam., 3–5-fid nearly to the base; segments strongly lobulate, more or less rounded at the apex, crisped along the margin; petioles fairly stout, greyish, shortly and densely setose, 0.5–2 cm long. *Tendrils* 0. *Male flowers*: pedicel finely setose-hispid to glabrous, 0.5–3 cm long; receptacle shortly and rather sparsely setose-hispid, 5–6 mm long; sepals shortly setose, erect, narrowly

triangular, 1.5–3.5 mm long; petals yellow, obovate, rather densely and shortly pubescent outside, 7–10 mm long. *Female flowers*: peduncles rather stout, 1–3 cm long; ovary narrowly ovoid or ellipsoid, shortly and thinly pubescent, 15–25 mm long. *Fruit* subglobose, green mottled with lighter green turning concolorous, yellow, glabrous, 8–15 cm in diam., with whitish very bitter pulp. *Seeds* black or brown, ovate in outline compressed, 8 mm long.

Type: Cogniaux cited specimens collected by Schinz, Luederitz, Pechuel-Loesche and Marloth 1192. Of these some have been destroyed in the Berlin Herbarium, but some of the specimens or duplicates are extant. The only remaining original specimen annotated by Cogniaux that was available for study is apparently Luederitz 136 in Z and thus automatically becomes the lecto-type.

SOUTH WEST AFRICA.—Omaruru: near Brandberg, Rodin 2755 (BOL, PRE); Merxmüller & Giess 1651 (M, PRE). Swakopmund: near Swakopmund, Marloth 1192 (BOL, GRA, L, PRE, SAM); Bradfield s.n. (GRA, PRE); 560 (PRE); Lam & Meeuse 4086 (L); de Winter 3193 (PRE); near Goanikontes, Rodin 2157 (BOL, PRE); near Rössling, Esdaile in Hb. Rogers 15365 (Z); Richthofen, Dinter 2807 (SAM); Haigamchab, Galpin & Pearson 7452 (PRE, SAM); 60 Km E. of Swakopmund, Dinter 6715 (B). Walvis Bay: near Walvis Bay, Jensen s.n. (PRE). Karibib: Kubas, Dinter 225 (SAM). Luederitz: Koichab dunes, Kinges 2345 (PRE); near Aus, Dinter 6117 (B, BOL); Gerstner 6316 (NBG, PRE). Exact localities unknown: "Gariëb", Lindner in Z (Lindner collected mainly near Otjimbingue); inter Walfischbay et Otjimbingue, Luederitz 136 (Z) = prob. s.n. (BR), this can be in the Swakopmund or Omaruru distr. (Lectotype in Z, isotype BR).

CAPE PROVINCE.—Richtersveld: Herre (seed only, grown in Pretoria, but died when still young so that no specimens were made).

C. ecirrhosus is almost entirely restricted to the "Namib", a desert area with a very low rainfall and usually sandy soil, and seems to be well adapted to the extreme climatic conditions in this habitat. Although limited in its distribution, this plant is locally often frequent. This is one of the very few Cucurbitaceae without tendrils. The fruit is invariably very bitter, in contra-distinction to that of *C. lanatus* which (even in the wild form) is usually not bitter.

12. CUCUMIS

Cucumis L., Sp. Pl. ed. 1: 1011 (1753); Gen. Pl. ed. 5: 442 (1754); Ser. in DC., Prodr. 3: 299 (1828); Naud. in Ann. Sci. Nat., 4me sér. 11: 9 (1859); 12: 108 (1859); Sond. in Fl. Cap. 2: 494 (1862); Benth. & Hook. f., Gen. Pl. 1: 826 (1867); Hook. f. in Fl. Trop. Afr. 2: 542 (1871); Cogn., Mon. Cucurb. 479 (1881); Pflanzenreich 275.2: 116 (1924); Pax in Pflanzenfam. 4, 5: 27 (1889); Phillips, Gen. ed. 2: 749 (1951).

Annual or perennial herbs, usually scabridly or setosely pubescent, mostly prostrate, sometimes scandent, rarely suberect. *Rootstock* of perennial species a thick and woody taproot or main roots fibrous, occasionally fibrous roots forming tubers with spongy tissue. *Leaves* usually angular to pinnatilobed or palmately divided, the lobes not frequently again lobulate or dissected, generally petiolate. *Tendrils* simple, occasionally reduced, straight or spinescent, very rarely absent. *Flowers* usually small, monoecious or less often dioecious, the male ones fasciculate or clustered, less often solitary, usually distinctly, but generally shortly pedicellate, rarely sessile, the female ones solitary, very rarely fascicled on usually short pedicels which are often thickened and often more or less elongate in fruit. *Male flowers*: receptacle campanulate, usually narrowly so, or turbinate; sepals 5, usually subulate or linear; corolla generally light yellow, sometimes pale yellow or bright yellow, usually rotate; the 5 lobes nearly free, obovate, oblong or ovate; stamens 3, free, with usually short linear filaments, two

2-thecous and the third 1-thecous, the thecae conduplicate, the connective produced at the apex into an appendage; rudiment of pistil present and evident. *Female flowers*: calyx and corolla as in the male but corolla not infrequently somewhat larger; staminodes 3, setiform or ligulate; ovary globose to fusiform or subcylindric, smooth, tubercled or with soft spines, glabrous or hairy, with 3-5 placentas and numerous horizontal ovules; style short, columnar, surrounded by a disc at the base; stigmas 3-5, globose, obovate or flattened and somewhat dilobed, sometimes connivent. *Fruit* various, rather small to large, globose, ovoid, ellipsoid, oblong or trigonous, when mature concolorous or longitudinally variegated with more or less mottled bands of a darker or a different colour, green, yellow, white, orange or red, smooth, pustulate, tuberculate or covered with protuberances or soft spines, glabrous or hairy, the pericarp usually firm but not hard, the interior juicy, pulpy or gelatinous, usually white or almost colourless, rarely green, orange or yellow. *Seeds* numerous, white, generally small, ovate, oblong or obovate, much compressed, smooth, immarginate but the margin more or less acute; cotyledons conforming to the outline of the seed; radicle conical, obtuse or subacute.

Type species: *C. sativus* L.

An Old World genus of about 30 species, the majority wide-spread in Africa, extending to the Middle East, Arabia and India, one African species introduced and naturalised in America, a few occurring as weeds in Europe and Australia, the commonly cultivated species (*C. sativus* L., cucumber; *C. melo* L., melons) sometimes, as escapes from cultivation, ruderal in many parts of the world.

The latest comprehensive treatment of the genus (Cogniaux, 1924) is not very satisfactory because several species are included which are referable to *Oreosyce* (= *Hymenosicyos* in the *Melothriaceae*!, not *Cucurbitaceae*).

Most species are found in arid and semi-arid regions, in deserts, steppes and savannah forests, very few prefer moister conditions and deep shade. One species (*C. humifructus*) is the only geocarpic member of the *Cucurbitaceae*.

- Tendrils wanting..... 11. *C. rigidus*
 Tendrils present at least at the base of most of the leaves, although sometimes short and stiff or occasionally more or less spinescent:
 Leaves pentagonal in outline, 2-4 cm long and broad, palmately 5-lobed with usually acute triangular lobes, firm in texture, finely scabrid; all other vegetative parts at least when young, pedicels, calyx, median veins of corolla and young fruit with very short, often curved, bulbous-based aculeate hairs; fruit asperulous, longitudinally banded, up to 3 cm long, on a 3-6 cm long stalk; dioecious prostrate perennial with woody whitish basal parts of stems (S.W. Africa)..... 6. *C. asper*
 Leaves either longer than broad, often over 4 cm long, or leaf-shape, leaf-size and/or pubescence, or fruit not as above:
 Leaves membranous when dry, about as long as broad, palmately 5-lobed with broad lobes; stems slender; fruits oblong-ellipsoid, longitudinally variegated with dark green mottled bands on a pale dull greenish-white to pale yellow background, smooth and glabrous except for a few perpendicular very thick long stiff multicellular hairs; green (not cane-cent) climbing to prostrate perennial with the habit of a *Melothria* (Transvaal)... 7. *C. umbrosus*
 Leaves not membranous when dry; plant and fruit not as above:
 Fruit not spiny or tubercled when ripe (smooth and glabrous or occasionally hairy); ovary hairy or glabrous but not with soft spines or tubercles:
 Annual, monoecious, not canescent nor glaucous; leaves usually large, about as broad as long, 6-8 cm in diam. and over; fruit usually over 5 cm long;
 Flowers sessile, several male ones and a female one clustered; ovary after fertilization pushed into the ground and ultimately fruit geocarpic on a 10-25 cm long peduncle..... 2. *C. humifructus*
 Flowers not clustered; fruit borne on a stout peduncle up to about 3 cm long above ground..... 1. *C. melo*
 Perennial, ovary and young fruit hairy; fruit when ripe up to about 4 cm long, rarely larger:

- Plant, especially young parts and lower surface of leaves covered with soft adpressed, usually yellowish to brownish, more rarely greyish hairs, leaves longer than broad, not distinctly cordate at the base, often somewhat 3-lobed, sometimes dissected, drying dark green to dark brown; fruit red when ripe; flowers dioecious (not in S.W. Africa)..... 3. *C. hirsutus*
- Plant canescent or glaucous, not with soft adpressed hairs; leaves usually about as long as broad; distinctly cordate at base, drying grey or greyish-green; fruit greenish yellow to orange when ripe; flowers monoecious:
- Fruit ellipsoid, pale (greenish)-yellow, with about 10 paler longitudinal bands, leaves sometimes lobed or subhastate..... 4. *C. angolensis*
- Fruit subglobose, deep yellow to orange, concolorous when ripe, leaves not lobed or subhastate..... 5. *C. dinteri*
- Fruit with soft spines, tubercles or protuberances; ovary with soft spines or tubercles: Leaves distinctly lobed to deeply pinnati- or palmatisect:
- Segments of almost completely palmatisect leaf 5-7, linear, many times longer than broad, usually entire and usually under 4 mm broad; dioecious perennial with variegated fruit..... 9. *C. heptadactylus*
- Segments of leaf not linear, as a rule over 4 mm broad, often coarsely dentate to lobulate:
- Female pedicels usually over 3 cm long; in fruit often much longer (6-18 cm); fruits not variegated or banded, usually very densely covered with long subulate soft spines..... 15. *C. anguria* var. *longipes*
- Female pedicels usually under 3 cm long and in fruit not much lengthened; if pedicels over 3 cm long, fruit variegated or with very short sparse spines:
- Fruit distinctly variegated at least when young with longitudinal usually darker bands, or, if indistinctly variegated when mature, globose, under 3 cm in diam. and species annual:
- Annual, monoecious; stems usually slender; leaves usually dissected, but rarely coarsely and more or less acutely incised-dentate:
- Spines on fruit laterally compressed, large, dense; fruit narrowly ellipsoid to oblong, usually over 4 cm long; bands on fruit brownish to dirty purple on a paler, dull pale yellow or greenish-white background; corolla usually over 1 cm long..... 12. *C. africanus*
- Spines on fruit terete or very small; fruit ellipsoid or subglobose, under 4 cm long, corolla under 1 cm, usually under 7 mm long:
- Fruit ellipsoid, distinctly longitudinally banded with dark green on a greenish-white background when immature, ultimately bands of a dirty orange to rusty-brown colour; spines rather dense, often over 2 mm long..... 13. *C. myriocarpus*
- Fruit subglobose, when mature pale yellow with or without indistinct narrow pale longitudinal bands; spines sparse, often under 2 mm long (sometimes very sparse and/or very short)..... 14. *C. leptodermis*
- Perennial, dioecious; stems usually stout; roots forming tubers 50-100 cm below ground; flowers over 1 cm long; leaves usually coarsely and more or less acutely incised-dentate..... 10. *C. kalahariensis*
- Fruit not variegated; perennials:
- Fruit under 5 cm long, covered with subulate spines over 2 mm long, usually densely so, rarely with shorter spines (not in S.W. Africa)..... 16. *C. zeyheri*
- Fruit usually over 5 cm long, sparsely covered with short conical spines or pustulate..... 17. *C. ficifolius*
- Leaves shallowly or hardly lobed:
- Leaves thin in texture, pubescence of semi-pungent but not aculeate patent long hairs; annual climber; fruits ellipsoid to subcylindric, sometimes more or less trigonal, 7-20 cm long, with coarse blunt protuberances, orange when ripe and filled with a green pulp..... 8. *C. metuliferus*
- Leaves, pubescence and fruit not as above:
- Fruit concolorous; densely covered with soft spines.... see 15. *C. anguria* var. *longipes*
- Fruit longitudinally variegated, not as densely covered with soft spines.... (young plants of) 13. *C. myriocarpus*

1. *C. melo* L., Sp. Pl. ed. 1: 1011 (1753); Hook. f. in Fl. Trop. Afr. 2: 546 (1871); Cogn., Mon. Cucurb. 482 (1881); Pflanzenreich 275.2: 120 (1924); Burttt Davy, Fl. Transv. 1: 228 (1926). Type: The name was originally based on pre-Linnaean authors, but the specimen "*Cucumis melo* 4 HU" in the Linnaean Herbarium (No. 1152/8) can be taken as the lecto-type.

Annual creeper. *Stems* branched, hirsute, glabrescent, in the wild forms sometimes short, but in cultivated forms up to 2 m long. *Leaves* sub-orbicular to reniform, usually angular or faintly 3-7-lobed, cordate at the base, as a rule denticulate, softly hairy to subhirsute on both surfaces, in cultivated forms up to 15 cm long and wide, but in the truly wild forms sometimes considerably smaller; petioles as a rule about as long as or longer than the corresponding blades, subhispid. *Tendrils* usually well developed. *Flowers* monoecious, light yellow. *Male flowers* fasciculate on slender pedicels up to 2 cm long; receptacle hairy, 4-8 mm long; sepals subulate, shorter than the receptacle; corolla in cultivated forms up to 2 cm long, but in the wild forms usually much smaller (often about 8 mm long). *Female flowers* solitary on a robust, up to 2 cm long pedicel; perianth as in the male; ovary various but in the wild forms ellipsoid or faintly turbinate, hairy. *Fruit* in the wild oblong or ellipsoid to obpyriform or somewhat turbinate, smooth, usually green mottled in bands with lighter greyish green but often ultimately concolorous, light to rather deep yellow, 4-6 cm long and 2-4 cm in diam. with white pulp (in cultivated specimens much larger with various types of skin and colour pattern; smooth or rough, yellowish, greenish, greyish or brownish, etc., and with yellow, orange or green pulp). *Seeds* in cultivated forms 10-12 mm by 5-7 mm, in wild forms sometimes considerably smaller.

The wild form, which is often referred to as the var. *agrestis* Naud., is a native of Africa south of the Sahara and extends southwards to Southern Rhodesia and the Transvaal and has also been recorded (in a truly "wild" state?) from south-west Asia. Cultivated melons are grown in all the warmer countries of the world, and elsewhere in greenhouses. Specimens that have run wild or are obviously culture relics often "degenerate" into forms approaching the original wild specimens, so that it is not always easy to see from a herbarium specimen if it is such a depauperate cultigen or a truly wild form. As far as can be ascertained, the wild form occurs in the Transvaal (usually in cultivated or old lands), but not in South West Africa or elsewhere in the Republic of South Africa.

As there is no sharp dividing line between the wild and the cultivated forms, it is not advisable to retain the wild ones as "var. *agrestis*". "*Forma culta*" is to be preferred as a designation for the cultivated melon races, if one does not refer to a particular race by its horticultural varietal name.

2. *C. humifructus* Stent (sphalm. *humofructus*) in *Bothalia* 2: 356, 358 cum icon. (1927); Meeuse in *Farming in S. Afr.*, June 1955; *Arch. Néerl. Zool.* 13, suppl. 1: 314-318 (1958). Type: *Stent* Hb. No. 2866 (indicated on the sheet by the author, PRE, holo!).

Cucumis sp. nov.?, Burt Davy, *Fl. Transv.* 1: 229 (1926).

Annual prostrate herb. *Stems* one to few from the apex of the rootstock, trailing, often rooting at the nodes, firm, stout, angular, pilose, up to 2 m, rarely 3 m, long. *Leaves* orbicular or broadly ovate-pentagonal in outline, obtuse to apiculate or subacute, cordate at the base, undivided, angular or faintly lobed, 5-15 cm in diam.; the margin minutely ciliate and callous-toothed, both surfaces scabrid with sharp bulbous-based hairs; main veins 5; petioles firm, terete, hispid, up to 6 cm long. *Tendrils* short, slender. *Flowers* in contracted racemes or fascicles, usually a few male ones together with a female one; male ones: pedicels slender, pilose, articulate below the receptacle, 6-20 mm long; receptacle about 5 mm long, pilose, 10-nerved; sepals 2-3 mm long, linear-subulate, obtuse, thinly pilose-hirsute; petals pale yellow, 2-7 mm long, papillose with short gland-tipped hairs on both sides, intermingled with pilose hairs on the veins outside, mid-vein protruding as a gland-like mucro; female ones: pedicel very short and stout, after pollination bending downwards, lengthening considerably and thickening into a long terete root-like organ reaching a length of 10-25 cm and a diam. of 3-5 mm, carrying the ovary into the soil; calyx and corolla as in the male, ovary ellipsoid

or narrowly ovoid, contracted into a narrow neck at the apex, densely covered with retrorse adpressed setae which act as barbs when the peduncle grows into the soil. *Fruit* geocarpic, subglobose, depressed globose or ellipsoid to ovoid, whitish, yellowish or pale greenish, glabrous, finely rugose, 5–9 cm long and in diam. *Seeds* white, much compressed, 16–20 mm long, 7–9 mm broad, embedded in a subhyaline jelly-like pulp.

SOUTH WEST AFRICA.—Grootfontein: Aha Mts., *Story* 6364 (PRE). “Otjisondu” (= Otjosandu) or Otjizondo?, district Karibib or Otjiwarongo?, *Püschel* in Herb. Dinter 579 (SAM, this specimen bears a tentative name “*Cucumis püschelii*” given by Dinter).

TRANSVAAL.—Waterberg: near Sandrivierspoort, *Stratford* s.n.: *Meeuse* 9631 (both PRE); Mosdene near Naboomspruit, *Galpin* M 146 (PRE, BOL). Potgietersrust (teste Stent). Pretoria: Elandsfontein, *v.d. Wal* s.n. (PRE); Cullinan (teste Stent). Cultivated specimens ex *Galpin* M 719 (which was a fruit only): *Stent* Hb. No. 2866 (type, PRE); “*Galpin* M 719” (PRE).

SOUTHERN RHODESIA.—Gwelo: plants grown at Salisbury from seed collected by *Arnold* at Gwelo, Hb. 3551, 6154 (SRGH). Hartley: Poole Farm, *Hornby* 3343 (SRGH).

Also in Tanganyika and the Belgian Congo.

This plant is interesting being the only geocarpic Cucurbitacea known. As a consequence of its geocarpy, the plant is only found on soils consisting of deep fine sand, obviously because the resistance of the soil must not be too great. Still, the peduncles often get damaged during their growth and do not bear fruit (field observations by the present author). The fruit, which develops only after the peduncle has reached its ultimate length, forms a waxy substance on its surface, so that it is water-repellent. This is obviously an adaptation to geocarpy—it serves to prevent early decay if the soil becomes water-logged.

Another interesting biological feature is the possible relation between the occurrence of antbears (or aardvarks), *Orycteropus afer* (Pallas) and of *Cucumis humifructus*. It is a fact that this plant is almost exclusively found near old ant-bear holes—this phenomenon was independently reported by several observers—and in the Waterberg district the name “Aardvark Cucumber” was used for this plant. It is an established fact that the animal eats the fruits and disperses the seeds with its dung (which it buries). For a detailed discussion see *Meeuse* 1955, 1958.

3. *C. hirsutus* *Sond.* in *Fl. Cap.* 2: 497 (1862); *Cogn.*, *Mon. Cucurb.* 489 (1881); *Pflanzenreich* 275.2: 133 (1924); *Burt Davy*, *Fl. Transv.* 1: 228 (1926); *Andrews*, *Flow. Pl. Anglo-Egypt. Soudan* 1: 172 (1950). Type: Sonder mentioned specimens collected by *Burke* (no. 297) and *Zeyher* (no. 581) from near Potchefstroom, Transvaal and *Krauss* 91 from “Port Natal”. *Burt Davy* (l.c.) designated the *Burke & Zeyher* gathering as “twin types” (*Herb. Sonder* in S). *C. sonderi* *Cogn.*, *op. cit.* 489 (1881); 134 (1924); *Burt Davy*, l.c. (1926).

Dioecious, prostrate, very rarely scandent, perennial herb. with woody rootstock. *Stems* annual, varying from rather slender to fairly robust, sulcate-angular to subterete, usually not much branched, when young densely, later more sparsely, pilose or subhirsute, up to about 2 m long. *Leaves* rigid to firmly herbaceous, often secund, cordate, pentagonal, elliptic, ovate-oblong, ovate or oblong-lanceolate in outline, entire or shallowly, rarely deeply, 3–5 (–7) lobed, palmately 5–7-nerved from the base, 2–10 cm long and 1–6 (–9) cm wide; the base truncate or rounded to shallowly and broadly cordate or occasionally subhastate; the apex of the leaf or its lobes acute or obtuse to rounded, usually minutely mucronate; the margin entire to sinuous or finely, rarely coarsely, denticulate; both surfaces more or less densely strigose-tomentose or setose, on

the upper surface often glabrescent and, if so, frequently turning white-punctate and scabrid, pubescence on the lower surface more persistent; petioles rather stout to slender, 0.5–2.5 cm long, hispid. *Tendrils* usually very short and reduced, more or less densely pilose or hispid. *Male plants*: flowers solitary or fasciculate or in a short raceme; common peduncle, if present, up to 25 mm long; pedicels slender, more or less densely pubescent, 0.5–3 cm or occasionally up to 7 cm long; receptacle narrowly campanulate, densely villous-hirsute or more or less densely pilose, 4–6 mm long, 3–4 mm wide at the apex; sepals linear to subulate or filiform, erecto-patent, 3–5 mm long; corolla light yellow, hairy, 6–13 mm long. *Female plants*: peduncle up to 3 cm long, in fruit incrassate and glabrescent; ovary subglobose to broadly ovoid or ellipsoid, densely covered with stiff hairs, about 7 mm long; calyx and corolla as in the male. *Fruit* globose or broadly ellipsoid, at first pale greenish yellow with irregular longitudinal dark green zones, when ripe red or brownish, concolorous, ultimately very sparsely hairy to glabrous, smooth, 4–6 cm long, 2.5–4 cm in diam. *Seeds* slightly compressed, 7–9 (–13) mm long, 5–7 (–10) mm broad.

Plants agreeing with the description given here occur from southern Soudan to the Rhodesias, Bechuanaland, Transvaal, Natal and the eastern Cape Province. It remains to be seen if the species *C. wildemanianus* Cogn. from the Belgian Congo is really distinct; if it is not, the area of distribution covers most of west tropical Africa as well.

The species is widespread and, judging by the numerous herbarium records, fairly common throughout its area of distribution. In the area under discussion it has been recorded from *Bechuanaland*: near Gaberones and Mochudi; *Transvaal*: practically all districts except a few in the extreme south-west, and Standerton, Wakkerstroom and Piet Retief; *Swaziland* (teste Burt Davy); *Natal*: most districts, not recorded from some lowland districts in Zululand; *Cape Province*: Mount Currie, Umtata, Kentani, Komgha and Mafeking. The following specimens are of special interest:

TRANSVAAL.—Potchefstroom: “Mooi River et Wonderfontein”, *Burke* 297; *Zeyher* 581 (syntypes in SAM). Potgietersrust: Makapansberge, *Rehmann* 5403 (BR). Lydenburg: *Wilms* 494 (PRE).

NATAL.—Durban: *Krauss* 91 (PRE, one of the original gatherings cited by Sonder). Biggarsberg: *Wood* 4548 (NH). All these specimens are cited by Sonder, Cogniaux or Burt Davy.

The species *Cucumis sonderi* Cogn., which was supposed to differ in leaf shape, cannot be maintained. The degree of dissection varies considerably, often on one specimen. A closely related group of species is centred around (and most probably is identical with) *C. welwitschii* Cogn., viz., *C. seretii* De Wild., *C. homblei* De Wild. and *C. seretioides* Suesseng. This group of species is supposed to differ from *C. hirsutus* mainly in the prominent nervation on the lower surface of the leaves (cf. Cogniaux's key in *Pflanzenreich*, 1924, p. 117–118), but this character seems to break down. Larger series of specimens from tropical Africa than available at the National Herbarium are required to establish the limits of variation and to decide if these species are really distinct. At any rate, the South African specimens form a homogeneous group and are undoubtedly all referable to *Cucumis hirsutus*. The “varieties” distinguished by Cogniaux (1924, etc.), and Burt Davy (1926) are only extreme forms linked up by series of intermediate specimens and not worthy of varietal rank.

4. *C. angolensis* *Hook.f. ex Cogn.*, *Mon. Cucurb.* 487 (1881); *Pflanzenreich* 275.2: 131 (1924). Type: *Welwitsch* 831 from Mossamedes, Angola (K, holo.!; COI, iso.!).

Perennial, glaucous and somewhat canescent. *Stems* prostrate to climbing, slender to stout but usually more slender than those of *C. dinteri*, usually not much branched, angular-sulcate, shortly hispid or with short bulbous-based setae along the angles, later often glabrescent and/or scabrid, as a rule over 50 cm long (in cultivated specimens up to 1.50 m). *Leaves* rather fleshy, varying in shape from reniform-suborbicular to cordate-ovate or sometimes triangular-cordate, sometimes more or less 5-lobed and subhastate, 4–8 cm long and broad, sometimes larger, with a rounded but usually abruptly and shortly apiculate apex and distinct basal sinus, if lobed, with usually somewhat angular and sub-acute, rarely rounded lobes; the margin varying from subentire to rather coarsely crenulate-dentate or undulate-sublobate; teeth usually separated by obtuse shallow sinuses; both surfaces at first densely and shortly setose-scabrid later often glabrescent turning scabrid, but main veins on lower surface remaining setose-hispid; petioles shortly hispid or setose with bulbous-based hairs, 2–10 cm long. *Tendrils* glabrescent. *Flowers* monoecious, light yellow. *Male flowers* solitary, fasciculate or very shortly racemose; pedicels slender to filiform, finely setulose, 2–20 mm long; receptacle more or less densely setulose to sericeo-setulose, 5–7 mm long; sepals erect, subulate, 4–6 mm long; corolla finely hairy, 5–9 mm long. *Female flowers* solitary on setulose or somewhat hispid 13–20 mm long pedicels; ovary oblong, densely covered with long stiff white hairs; corolla sometimes larger than in the male flowers. *Fruit* ellipsoid, smooth, glabrous, yellowish green to pale lemon-yellow and longitudinally variegated with about 10 narrow paler bands, 4–5 cm long and 3–4 cm in diam. *Seeds* elliptic, usually with the widest part in the middle and both ends tapering into a subacute point, 5–6 mm long and about 2 mm broad.

ANGOLA.—Mossamedes: *Castro* 136 (COI); *Exell & Mendonca* 2157 (BM, COI). SOUTH WEST AFRICA.—Kaokoveld: *Anabib* (Orupembe), *Story* 5699; 5747 (PRE); Karos Fountains, *de Winter* 3086 (PRE, K, M); Sesfontein, *de Winter & Leistner* 5863 (PRE, K, M); 5786a (only fruits collected; specimens grown at Roo-deplaat near Pretoria as 5786a bis in PRE); Otjihu, *de Winter & Leistner* 5661 (PRE, K, M). Outjo: Franzfontein, *Liebenberg* 4925 (PRE); Witklipp, *Volk* 2895 (PRE); 2897 (M).

This species is closely related to *C. dinteri* and hybridizes with the latter as was shown by Dr. S. Rehm of the Division of Horticulture. These two species cannot always with certainty be separated in the herbarium, but Dr. Rehm has grown them side by side and there are quite a number of differences which, however, cannot always be noticed in herbarium specimens.

In the first place there is a difference in habit. *C. dinteri* grows as a short suberect to decumbent bush with stems up to 50 cm long. *C. angolensis* forms much longer prostrate to climbing stems well over 50 cm long. *C. angolensis* is glaucous and not so canescent as *C. dinteri*. Other differences are in the size of the leaves (larger in *C. angolensis*) and in leaf-shape (leaves not lobed in *C. dinteri*, sometimes lobed in *C. angolensis*), but none of these are absolutely reliable. The best and apparently reliable differences are in the fruits and seeds. *C. dinteri* has subglobose and concolorous yellow to orange fruits and obovate seeds, whereas *C. angolensis* has larger ellipsoid and longitudinally variegated greenish yellow to pale yellow fruits and longer elliptic seeds. There are also important chemical differences between the two, *C. dinteri* having extremely bitter fruits rich in cucurbitacin D and very bitter leaves, and *C. angolensis* having only slightly bitter fruits with a mere trace of cucurbitacin D and almost non-bitter leaves. There is also a difference in distribution, *C. angolensis* being restricted to southern Angola and the Kaokoveld region and *C. dinteri* having a more southern distribution.

5. *C. dinteri* Cogn., in Bull. Herb. Boiss. 2 me sér. 1: 882 (1901); Pflanzenreich 275.2: 131 (1924). Type: *Dinter* 1436 from Giftkopje, Omaruru, S.W. Afr. (Z, holo.!: BR, iso!).

C. cogniauxianus Dinter ex Cogn., op. cit. 131 (1924). Syntypes: Aus, *Dinter* 1115; Satansplatz, *Dinter* 2078; Buellspport, *Dinter* s.n.

Perennial, canescent. *Stems* suberect to decumbent, usually under 50 cm long, angular-sulcate, often very woody and grey to white at the base, the younger parts shortly and usually sparsely hispid or setose-scabrid on the angles. *Leaves* canescent, as a rule suborbicular-cordate or reniform-cordate, sometimes faintly 5-angled rarely very indistinctly 5-lobed, rounded at the apex or shortly and abruptly apiculate, deeply cordate at the base, firm and rather thick in texture, usually distinctly crenate-dentate along the margin, on both surfaces at first rather densely and shortly setose-strigose, glabrescent, but veins on lower surface persistently setulose-hispid, blade usually under 5 cm long and broad; petioles shortly hispid or setose, rarely over 5 cm long. *Tendrils* usually short or more or less reduced, shortly and sparsely hispid. *Flowers* monoecious. *Male flowers* solitary or in fascicles of 2-3; pedicels slender to filiform, finely setulose, 2-10 mm long; receptacle more or less densely setulose to sericeo-setulose, 4-6 mm long; sepals erect, subulate, 1.5-2 mm long; corolla bright light yellow, finely hairy, 5-7 mm long. *Female flowers* solitary on 3-12 mm long pedicels, ovary ovoid-globose to oblong, densely covered with rather long stiff, white hairs. *Fruit* subglobose when ripe, smooth, glabrous, yellow to orange and concolorous, 2-3.5 cm long and 2-3 cm in diam. *Seeds* obovate with narrow base and rounded to subacute apex, 4-4.5 mm long and about 2.5 mm broad.

SOUTH WEST AFRICA.—Omaruru: Erongo, Giftkopje, *Dinter* 1436 (Z, holo.!, BR, iso.). Karibib: Usakos, *Dinter* 5932 (B); Klein Ameib, *Dinter* 7088 (B, BOL, M, PRE, Z); Kubas (near Ababis), *Dinter* 223 (COI, PRE, SAM); Karibib, *Kinges* 3637 = *Kräusel* 730 (M); Donkerhoek, *Volk* 2769 (M). Rehoboth: Buellspport, *Dinter* s.n. (PRE, SAM); *Strey* 2084 (PRE); farm Djab, *Walter* 4512 (M). Rehoboth or Maltahöhe: Naukluft Mts., *Rodin* 2886 (BOL); Naukluft, *Dinter* 8313 (B), *Volk* 819 (M). Gibeon: Haribes, *Volk* 2450/1956 (M); Satansplatz, *Dinter* 2078 (SAM); Leber River, Ganaams, *Pearson* 9374; 9375 (BOL). Luederitzbucht: farm Weissenborn, *Kinges* 2383 (PRE); Aus, *Dinter* 1115 (PRE, SAM); 6114 (B, BOL, M, PRE, SAM); *Merxmüller & Giess* 2366 (M, PRE). Bethanien: Tschaunaup Mission, *Gerstner* 6328 (PRE). Keetmanshoop: Keetmanshoop, *Dinter* 3558 (B); about 25 miles from Aroab on road to Rietfontein, *de Winter* 3406 (PRE, K, M); about 19 miles from Ariamsvlei on road to Warmbad, *de Winter* 3574 (PRE, K, M); Karas Mts., *Boss TRV* 35901 (PRE); Klein Karas, *Dinter* 5086 (B); s.n. (PRE); *Oertendahl* 70 (PRE); Hologo, Bed of Great Fish River, *Pearson* 9705 (BOL); Seeheim, *Dinter* "3897", may be *Schaefer* 446 (B). Warmbad: Garius, *Dinter* 4233 (B, SAM).
CAPE PROVINCE.—Hay: Lelykstad, *Acocks* 223 (KMG, BOL, NH). Kenhardt: 12 miles S.E. of Kakamas, *Acocks* 14382 (PRE).

For a discussion of the differences between *C. dinteri* and *C. angolensis*, see under the latter.

6. *C. asper* Cogn., in Bull. Herb. Boiss 2me. sér. 1: 882 (1901); Pflanzenreich 275.2: 135 (1924); *Dinter* in Fedde, Repert. 16: 364 (1920). Type: *Dinter* 1447 from Ababis (distr. Karibib), S.W. Afr. (Z, holo.!).

Perennial. *Stems* rather numerous from the apex of the perennial woody rootstock, prostrate to climbing, branched mainly near the base, up to about 75 cm long; when young green, longitudinally sulcate, wiry but slender, densely covered with very short bulbous-based setose-hispid hairs, soon becoming grey or canescent, ultimately very woody and covered with a longitudinally fissured whitish bark and up to about 8 mm in diam. *Leaves* more or less pentagonal in outline, firmly herbaceous, 2-4 cm long and broad, 5 (-7)-lobed nearly to the middle or less deeply so with usually 5 triangular lobes of which the central one is somewhat larger, and sometimes two very small

additional basal ones; all lobes usually acute, distantly and irregularly dentate or subentire, often mucronulate, rarely rounded and/or lobulate; lamina finely scabrid-setulose on both surfaces, but especially along the margin and on veins on lower surface, with bulbous-based short aculeate hairs, soon becoming finely scabrid (the aculeate hairs remaining longest on the margins and the veins below), with a triangular, rather shallow to rather deep basal sinus; petioles slender, 1.5–4 cm, occasionally up to 6 cm long, densely and finely aculeate-hispid with bulbous-based thick aculeate hairs which are partly retrorse (mainly in upper half of petiole) partly curved upwards (mainly in basal part of petiole), or nearly all pointing upwards. *Tendrils* slender, rather long, glabrescent. *Flowers* dioecious, rarely monoecious, pale yellow. *Male flowers* solitary, fascicled or in short few-flowered racemes; peduncles and pedicels filiform, finely and shortly aculeate-hispid, the first up to 8 mm, the last up to 25 mm long; receptacle finely aculeate-hispid, 3–5 mm long; sepals triangular-subulate with linear not very acute tip, finely setulose-aculeate, 1.5–3 mm long; corolla-lobes sparsely and very shortly aculeate-scabrid on median veins, 4–5 mm long. *Female flowers* solitary, pedicels considerably thicker than the male ones, with the same scabrid pubescence, in flower up to about 3 cm, in fruit up to about 6 cm long; ovary oblongo-fusiform, densely setose-puberulous. *Fruit* ellipsoid, somewhat obovoid or somewhat obpyriform, rather densely covered with very short retrorse aculeae on a thick hard base, when ripe greyish-green with longitudinal mottled dark green bands, 2.5–3 cm long and 2–2.5 cm in diam. *Seeds* obovate-elliptic, 5–6 mm long, 2.5–3 mm broad.

SOUTH WEST AFRICA.—Kaokoveld: 30 miles S. of Kunene on road to Orupembe, *de Winter & Leistner* 5796 (PRE, K, M); Ombepera, *de Winter & Leistner* 5468 (PRE, K, M). Omaruru: Brandberg, Tsisab Gorge, *Merxmüller & Giess* 1657 (M, PRE). Karibib: Ababis, *Dinter* 1447 (Z, holo!).

Apparently a very local endemic growing in rock crevices. The asperulous fruits are unique in the genus and very characteristic. Cogniaux described this species as monoecious, but plants grown in Pretoria (Division of Botany Garden) and at Roodeplaat Horticultural Research Station were all monosexual, so that *Dinter* 1447 must have been an abnormal plant.

7. *C. umbrosus* A. Meeuse & Strey, sp. nov., a fructu oblongo-ellipsoideo levi sparse setis patentibus subpungentibus pluricellularibus armato demum glabrescenti et habitu *Melothriae* facile distinguendus.

Perennis herbaceus monoicus. *Radices* 1–2 m longae, divergentes, in partibus superioribus incrassatae, fusiformes, ad 1 cm diam. *Caules* pauci vel plurimi, scandentes vel interdum prostrati, graciles, angulati, pilis brevibus unicellularibus et pilis longioribus 3–4-cellularibus hirsuto-pilosis, ad 5 m longis. *Folia* herbacea ambitu 5-angulata vel late ovata basi cordata, 5-lobata (interdum 5-secta) utrinque setuloso-strigosa, 3–6 cm longa et lata, sinu basilari profundo angusto, lobis latis subangulatis vel subrotundatis (interdum angustioribus) obtusis mucronatis margine leviter subremoteque crenato-denticulatis, petiolis gracilibus breviter pilosis 3–6 cm longis. *Cirrho* gracillimi, hirtiusculi, glabrescenti, 3–9 cm longi. *Flores masculi* solitarii, pedicellis ad 3 cm longis, receptaculo campanulato ca. 5 mm longo, sepalis subulatis vel filiformibus, 4–5 mm longis, corolla pallide flava papillosa ca. 8 mm longa. *Flores feminei* solitarii, pedicellis demum 5–8 cm longis, corolla 9–12 mm longa, ovario, ellipsoideo vel fusiforme, dense piloso. *Pepo* oblongo-ellipsoideus, setis patentibus pluricellularibus subpungentibus sparse hirsutus, glabrescens, fasciis irregularibus alternim pallentibus (demum flavescens) et atroviridibus longitudinaliter variegatus, ad 4 cm longus et 2 cm latus. *Semina* numerosa, elongato-ovata, ca. 3 mm longa.

TRANSVAAL.—Soutpansberg: Wylliespoort, *Meeuse* 10612. Middelburg: Kloofs on northern side of Loskop Dam, Farm Rietvallei 92, *Strey* 2851; *Meeuse & Strey* 10317 (PRE, holo.!; B, BOL, BM, BR, EA, K, L, M, P, S, SRGH, isos!).

A perennial herbaceous climber with the habit of a *Melothria*, growing in shady places. *Roots* several, up to 2 m long, divergent, in upper portions swollen, more or less fusiform, up to 1 cm in diam., crown of the roots with buds which give rise to several stems. *Stems* few to many, usually branched, weak and slender, climbing or occasionally prostrate, pubescent with short unicellular and longer 3-4-cellular rather stiff hairs, especially in youngest parts, up to 5 m long. *Leaves* softly herbaceous, in outline pentagonal or broadly ovate with cordate base, 5-lobed to a little less than the middle, or in Rhodesian specimens 5-fid, on both sides rather densely covered with adpressed bristly hairs, 3-6 cm long and as wide; basal sinus deep and narrow; lobes rounded or somewhat angular, in Rhodesian specimens narrower, oblong-lanceolate, usually obtuse, mucronate, the margin shallowly and rather remotely denticulate with the veins protruding at the teeth as minute mucros; basal lobes usually considerably smaller than the upper 3; petioles slender, shortly hairy, 3-6 cm long. *Tendrils* slender, finely hirtellous, glabrescent, up to 9 cm long. *Flowers* all solitary. *Male flowers*: pedicels slender, finely setulose-pubescent, up to 3 cm long; receptacle campanulate, setulose-pubescent, about 5 mm long; sepals subulate or filiform, 4-5 mm long; corolla pale yellow, papillose, about 8 mm long. *Female flowers*: pedicels slender, ultimately 5-8 cm long; corolla lobes 9-12 mm long; ovary broadly fusiform or ellipsoid, densely setose-pilose. *Fruit* oblong-ovoid, smooth with sparse stiff patent bristly hairs, glabrescent, banded with mottled bands of a dark green colour on a pale green to yellowish background, up to 4 cm long and 2 cm in diam. *Seeds* numerous, elongate-ovate, in fruits studied up to 3 mm long.

This species is rather aberrant in that it grows in the shade, sometimes in deep shade, whereas all other species known to me are found in open country or at best in forest edges, and also because in habit it resembles species of *Melothria* (slender climbing stems, leaf-shape). The first specimen collected (*Strey* 2851), with male flowers only, was without hesitation referred to *Melothria* spec., until the flower dissection unmistakably indicated the genus *Cucumis*. Material with female flowers and fruits was especially collected in the same locality to enable a description of this remarkable plant.

A second locality was discovered later in Wylliespoort which seems to point out that this species must have been overlooked in the past. A search in suitable localities (rather moist ravines and kloofs on granite, quartzite and other acid rocks, in the shade) will certainly reveal that this plant is more widespread.

A study of some Rhodesian specimens showed that they differ from the Transvaal ones only in the more deeply dissected leaves and I do not hesitate to include these specimens in *C. umbrosus*.

SOUTHERN RHODESIA.—Umtali distr.: Umtali Commonage, *Chase* 769, 5979 (PRE, SRGH); Limunya's Reserve, *Chase* 6008 (PRE, SRGH).

8. *C. metuliferus* E. Mey. ex Schrad. in *Linnaea* 12: 406 (1838); Naud. in *Ann. Sci. Nat.* 4me. sér. 11: 10 (1859); Sond. in *Fl. Cap.* 2: 495 (1862); Hook. f. in *Fl. Trop. Afr.* 2: 543 (1871); Cogn., *Mon. Cucurb.* 499 (1881); *Pflanzenreich* 275.2: 146 (1924); Hiern, *Cat. Welw. Afr. Pl.* 1, 2: 397 (1898); Burt Davy, *Fl. Transv.* 1: 228 (1926); Hutch. & Dalz., *Fl. W. Trop. Afr.* 1: 182 (1931); Andrews, *Flow. Pl. Anglo-Egypt. Soudan* 1: 172 (1950). Type: A *Drege* specimen from "Omsamwubo" in Herb. Sonder (S, holo.).

Annual. *Stems* climbing or prostrate, sulcate, with long stiff patent hairs, up to several meters long. *Leaves* herbaceous, dark green, cordate or cordate-ovate, usually with a large basal sinus, shallowly 3-5-lobed or -angled, acute or shortly acuminate, with irregularly dentate margin, at first rather densely hairy mainly on the veins later glabrescent and scabrid, 4-15 cm long and about as wide; petioles with long hairs like the stems, 3-10 cm long. *Flowers* monoecious. *Male flowers* fascicled or solitary;

pedicels filiform, pilose, 0.5–2 cm long; receptacle pilose, about 4 mm long; sepals about 2 mm long; corolla hairy, light yellow, 5–6 mm long. *Female flowers* solitary, ovary ellipsoid, oblong or somewhat fusiform, covered with robust soft spines ending in a thin bristle, 15–20 mm long. *Fruit* subcylindric, ovate or ellipsoid, to subcylindric, often somewhat trigonal, at first a finely mottled dark green, when ripe orange-red, with green pulp, thinly covered with 1–1.5 cm long blunt or bristle-tipped stout protuberances (5–) 8–16 cm long and 4–9 cm in diam. *Seeds* numerous, much compressed, ellipsoid, attenuate at the base, 6–8 mm long.

Found in Africa south of the Sahara, extending in the south-west to the Okavango area and, in the east, along the coast just reaching the eastern Cape Province. It has been recorded from the following: *South West Africa*: Okavango area; *Bechuanaland*; *Transvaal*: Soutpansberg, Sibasa, Pietersburg, Letaba, Lydenburg, Pilgrim's Rest, Nelspruit, Pretoria; *Swaziland*; *Natal*: fairly widespread in Zululand but, in recent years, not collected near Durban and further south, where it was collected a century ago; *Cape Province*: Port St. Johns. The following specimens are noteworthy: Zululand, *Gerrard & McKen* s.n. (NH); Port St. Johns, Umzimvubu ("Omsamwubo"), *Drege* (L, isotype!).

The attractive reddish-orange fruit which contains a large number of seeds embedded in a light emerald green "jelly" occurs in two types, bitter (and unpalatable) or non-bitter and reputed to be an excellent vegetable like the cucumber; in South Africa locally known as "jelly-melon" and occasionally cultivated.

9. *C. heptadactylus* *Naud.* in *Ann. Sci. Nat.* 4me. sér. 11: 24 (1859); *Sond.* in *Fl. Cap.* 2: 497 (1862); *Cogn.*, *Mon. Cucurb.* 497 (1881); *Pflanzenreich* 275. 2: 142 (1924); *Burt* *Davy*, *Fl. Transv.* 1: 229 (1926).

Perennial. *Rootstock* woody. *Stems* prostrate, usually rather slender, branched, geniculate at the nodes, angular, striate or sulcate, shortly pilose or hirsute, up to about 1.50 m long. *Leaves* rather stiff, greyish-green or canescent, 5–7-parted nearly to the base; the lobes linear, acute, entire or with one or a few teeth and revolute margin, thinly setose to nearly glabrous above, setose-scabrid and white-punctate beneath, the terminal one 4–10 cm long and 1–4 mm wide (rarely wider), the lateral ones shorter, the lowermost ones much shorter; petioles slender, hairy, 3–40 mm long. *Tendrils* usually very short. *Flowers* dioecious. *Male plant*: flowers fasciculate or shortly racemose (occasionally by reduction solitary); peduncle 1–10-flowered, slender, hairy, up to about 2 cm long; receptacle obconic, thinly hispid, 4–6 mm long; sepals narrowly triangular, 1.5 mm long; corolla pale yellow, shortly pubescent, 3–4 mm long, petals shortly cuspidate. *Female plant*: flowers solitary on short pedicels; ovary covered with soft thick bristles, ellipsoid. *Fruit* ovoid or ellipsoid, with dark longitudinal bands, 3–5 cm long, 2–4 cm in diam., covered with thick subcylindric callous-tipped and minutely setose-mucronate blunt spines. *Seeds* oblong, 6–7 × 3–4 × 1.5 mm.

CAPE.—Vryburg: *Rodger* Hb. no. 26976 (SAM); *Henrici* 76; 176 (PRE). Kuruman: 24 miles E. of Korannaberg on road to Tsenin, *Rogers* 12569 (BOL); Esperanza, *Esterhuysen* 2146 (BOL, PRE). Hay: Griquatown, *Wilman* s.n. (PRE); Papkuil, *Wilman* Hb. no. 1298 (KMG); Asbestos Hills, Clifton, *Acocks* 2132 (PRE, KMG); Bernouilli, *Wilman* Hb. no. 26950 (SAM); Witwater, *Wilman* Hb. no. 1408 (KMG). Barkly West: Asbestos Mts., *Hutchinson* 3020 (BOL); Daniels Kuil, *Wilman* Hb. no. 2994 (KMG, BOL, PRE); *Lewis* Hb. no. 54221; 53488 (SAM); *Leistner* 621 (PRE, KMG); Hoekplaas, *Acocks* 1856 (PRE); Pniel, *Acocks* 1579 (PRE, KMG); 1538 (PRE); near Vaal Hartz, v.d. *Linde* s.n. (PRE). Kimberley: *Kolbe* 4001 (BOL); Riverton, *Wilman* Hb. no. 570 (KMG); Kenilworth, *Wilman* Hb. no. 22012 (PRE); Spytfontein, *Marloth* 842 (PRE). Herbert: Honeynest Kloof, *Wilman* Hb. no. 569 (KMG, PRE). Hopetown: *Muskett* in Hb. Bolus no. 2561 (BOL). De Aar: Quaggafontein, *Story* 1085 (PRE). Victoria West or Richmond: Winterveld, *Drege* 8183 (L.).

Colesberg: *Burke* 139 (SAM); *Zeyher* 591 (SAM). Middelburg: *Leistner* 629 (PRE); Grootfontein: *Theron* 719 (PRE). Albert: Burghersdorp, *Pocock* 133 (GRA).

TRANSVAAL.—Christiana: *Burt Davy* 12996 (PRE). Ventersdorp: Goedgedacht, *Sutton* 551 (PRE).

ORANGE FREE STATE.—Jacobsdal: Grysbank, *Schweickerdt* 1139 (PRE). Fauresmith: *Smith* 5277a (PRE); *Pont* in Herb. *Henrici* 2942 (PRE); *Codd* 3410 (PRE). Bloemfontein: near Besters Put, *Burt Davy* 11773 (PRE). Bethulie: near Bethulie, *Flanagan* 1501 (BOL, PRE, SAM). Rouxville: Commissie Drift, *Acocks* 12517 (PRE). "Caledon River" (probably Rouxville): *Zeyher* 590 (PRE).

This species is quite distinct by its deeply dissected leaves with very long and narrow linear lobes unlike those of all other species, and its dioecious flowers. A specimen collected by Bolus (no. 13110, BOL) is labelled "Hex River, De Doorns". This locality does not seem to link up with the area of the species and the locality or the label may be wrong.

10. *C. kalahariensis* *A. Meeuse*, sp. nov., aff. *C. heptadactylo* et *C. africano*, sed radicibus tuberiferibus praecipue differt.

Dioicus, perennans. *Caules* procumbentes, elongati, ramosi, robusti, angulato-sulcati, minute sparseque hirsuti demum scabri vel subglabri ad 3 m longa et 0.5 cm diam., ad nodos geniculati radicantes, radicibus simplicibus fibrosis bipedalibus, extrema radice tubere fusiformi vel subcylindrato spongiosi-carnoso 5–20 cm longo 2–3 cm diam.; internodia ad 20 cm longi. *Folia* subcanescentia, rigida, ambitu ovata vel ovato-oblonga, profunde 3–7-fida, utrinque minute setoso-hispidula demum scabra, 5–15 cm longa 3–9 cm lata, lobis oblongis vel linearibus acutis vel subacutis vel subapiculatis crasse dentatis vel pinnatilobatis 1–5 cm longis. *Cirrho* robustiusculi, satis breves, basin versus distincte incrassati minute aculeato-setosi demum scabri. *Flores masculi* solitarii vel interdum fasciculati, pedicellis gracilibus breviter setosis 1–2 cm longis, receptaculo anguste campanulato, dense setoso ca. 7 mm longo, sepalis lineari-subulatis, setosis, ca. 5 mm longis, corolla flava, 6–7 mm longa. *Flores feminei* solitarii, pedicellis brevibus 4–6 mm longis ca. 1.5 mm crassis, sepalis et corolla ut in mare sed majoribus, ovario ellipsoideo vel ovoideo dense setoso. *Pepo* ellipsoideus vel oblongus, aculeatus fasciis alterne albo-viridibus et fusco-purpureis longitudinaliter variegatus, 3.5–5 cm longus 2–3 cm crassus, aculeis crassulis compressis subuncinatis obtusis vel subacutis minute mucronatis ca. 5 mm longis. *Semina* ovato-elliptica, albida, 6–7 mm longa, 3–4 mm lata 1.5–2 mm crassa.

Type: *Story* 5320 (male and female plant), grown from seed at the Roodeplaat Horticultural Research Station (seed originally collected by Dr. R. Story at Nama Pan, South West Africa), in National Herbarium, Pretoria.

Perennial dioecious creeper. *Stems* annual, branched, rather stout, angular-sulcate, minutely and sparsely hirsute when young, later becoming scabrid to subglabrous, geniculate and rooting at the nodes, up to 3 m long and 0.5 cm in diam., internodes up to 20 cm long. *Roots* fibrous, 50–60 cm long, towards the base dilated to form cylindrical, fusiform or sausage-shaped tuberous portions 5–20 cm long and 2–3 cm in diam., which are covered with a thin light-brown bark and contain a fleshy-spongy soft white tissue inside. *Leaves* somewhat greyish-green, rather rigid, secund, in outline ovate or ovate-oblong, deeply palmately 3–7-fid, on both sides at first finely setose-hispidulous, ultimately scabrid, 5–15 cm long and 3–9 cm wide; the lobes oblong to linear, acute, subacute or subapiculate, coarsely dentate to somewhat pinnatilobed; petioles rather stout, sulcate, at first finely aculeate-setose, ultimately scabrid, 1–5 cm long. *Tendrils* stoutish, rather short, distinctly thickened towards the base, minutely aculeate-setose, glabrescent, turning scabrid. *Male flowers* solitary or occasionally fasciculate, on slender, shortly setose-hispid pedicels 1–2 cm long; receptacle narrowly

campanulate, densely setose, about 7 mm long; sepals linear-subulate, setose, about 5 mm long; corolla yellow, 6–7 mm long. *Female flowers* solitary on pedicels 4–6 mm long and 1.5 mm thick; sepals and corolla as in the male flower, but larger, 7–9 mm and 9–15 mm respectively; ovary ellipsoid or somewhat ovoid, densely setose. *Fruit* ellipsoid or oblong, aculeate, variegated by irregularly bordered brownish-purple longitudinal bands on a greenish-white background, 3–5.5 cm long and 2–3 cm in diam., spines soft and rather thick, laterally compressed, somewhat uncinatate, obtuse to subacute, finely mucronate, about 5 mm long. *Seeds* white, ovate-elliptic, 6–7 mm long, 3–4 mm wide and 1.5–2 mm thick.

SOUTH WEST AFRICA.—Grootfontein: Karokowisa, *Schoenfelder* 10; Nama Pan, *Story* 5320 (cultivated at Roodeplaat, PRE, holotype!).

BECHUANALAND.—272 miles N.W. of Molepolole on way to Ghanzi, *Story* 4986 (fruits and underground storage organs only; also specimens cultivated in Pretoria); 132 miles N.W. of Molepolole, *Story* 4895; Kaotwe, *van Son* in TRV 28803 (all in PRE).

This interesting species is characterised by its dioecious flowers, underground storage organs and spinose banded fruits with seeds which are rather large for the genus. In several respects *C. kalahariensis* resembles *C. hookeri*, but the latter is an annual with monoecious flowers and fruits with relatively more spines and smaller seeds. There is also an affinity with the dioecious *C. heptadactylus*, but the shape of the leaf and the different root system of the latter are quite sufficient for a clear distinction, apart from other details such as pubescence, size of flowers and morphology of the fruit. Vegetatively, *C. kalahariensis* also resembles *C. ficifolius* (= *C. pustulatus*) and if a specimen of the latter (which is monoecious and bears concolorous fruits) only bears flowers of one sex and no fruits it is almost impossible to distinguish between them. However, these two species do not appear in the same regions: *C. kalahariensis* is a species of deep Kalahari sand soils, whereas *C. ficifolius* has not been found in similar localities, and any doubtful specimens can be referred to the one species or the other if the locality is known.

The curious underground tuberous swellings of the roots are edible and are used by the Bushmen tribes in north-eastern South West Africa and northern Bechuanaland. Unfortunately, such appropriate epithets as “*edulis*” and “*tuberosus*” are pre-occupied in *Cucumis*, so that the name “*kalahariensis*” is given here, which refers to its apparently specific habitat.

Dr. Story, previously of the Botanical Survey, has taken a great deal of trouble to obtain good specimens by growing plants from tubers at Prinshof Experimental Station, but unfortunately only male plants appeared. Dr. S. Rehm of the Division of Horticulture raised some male and female plants from Dr. Story's fruits collected under no. 5320. From these plants a number of flowering male and female specimens and some ripe fruits were obtained. These specimens constitute the only complete material of this species and they were selected as the type, although one would, as a rule, prefer specimens taken from plants grown under natural conditions. A comparison between the cultivated specimens and wild specimens suggests that the size of the leaves as given in the description may be on the large side, but otherwise there is no essential difference.

11. *C. rigidus* E. Mey. ex Naud. in Ann. Sci. Nat. 4me. sér. 11: 85 (1859); Sond. in Fl. Cap. 2: 497 (1862); Cogn., Mon. Cucurb. 507 (1881); Pflanzenreich 275.2: 154 (1924). Type: A specimen leg. Drege in north-west Namaqualand near the Orange River (“*Gariiep*”), presumably the actual type in P (iso.! in L). *C. rigidus* E. Mey. ex Arnott in Hook., Journ. Bot. 3: 278 (1841), nomen tantum; Drege, Zw. Pflzgeogr. Doc. 92: 176 (1943), nomen nudum.

Perennial monoecious prostrate to erect or suberect canescent suffrutex. *Stems* firm, robust, branched, angular, densely covered with adpressed thick stiff hairs, up to about 0.5 m rarely 1 m, long, the older parts in the grooves between the angles with thin adpressed white hairs and aculeate with thick hard white setae, ultimately glabrescent but persistently white or canescent. *Leaves* stiff and thick, canescent, ovate in outline, truncate or slightly decurrent at the base, rounded at the apex, with an irregularly and sparsely dentate or dentate-lobulate margin, very scabrid-setose turning punctate-scabrid, 3–6 cm long and wide, entire to crenulate-lobulate to more or less 3-lobed with ovate obtuse lobes of which the central one is the longest, separated by rounded sinuses; petioles rigid, firm setose-scabrid, 1–5 cm long. *Tendrils* 0. *Male flowers* subsessile or on pedicels up to about 1 cm long, usually solitary; receptacle obconic-campanulate, densely canescent-villous, 4–6 mm long, sepals triangular, about 2 mm long, hairy like the receptacle; petals hirsute outside, about 4 mm long. *Female flowers* solitary, peduncles up to 1 cm long; ovary oblong, densely covered with rigid thick bulbous-based setae. *Fruit* ovoid to ellipsoid, concolorous, 4–6 cm long, 2.5–4 cm in diam., rather sparsely covered with soft flattened, 5–6 mm long spines which end in a bulbous-based mucro. *Seeds* 6–7 mm long.

SOUTH WEST AFRICA.—Luederitz: Kahanstal, *Dinter* 8128 (B, BOL, PRE). Warmbad: S. of Warmbad, *Pearson* 4021; 4023 (BOL).

CAPE.—Namaqualand: near Orange River, *Drege* s.n. (L, iso.); Bethany Drift, *Pearson* 6049 (BOL); Anisfontein, *Pillans* 5300 (BOL); Sendlingsdrift, *Pillans* 5501 (BOL); Doornpoort, *Pearson* 6911 (BOL); Drieklip, *Tucker* Hb. no. 13235 (BOL); Richtersveld, *Marloth* 12330 (BOL, PRE).

12. *C. africanus* L.f., Suppl. Pl. 423 (1781), non sensu auct. Type: specimen in Hermann Herb. (BM), corresponding to Herm., Parad. Bot. t. 134. *C. hookeri* Naud. in Gard. Chron. 30: 1503 (1870); Illustr. Hort. 1871: 239 (1871); Journ. Bot. 9: 58 (1871); Cogn., Mon. Cucurb. 503 (1881); Pflanzenreich 151 (1924). Type: cultivated specimens in Paris (grown from seed) in P, holo.; photo.! in PRE.

Annual herb. *Stems* prostrate, slender to stout, branched, sulcate, shortly hirsute or pilose or occasionally aculeate on the raised lines between the grooves, turning scabrid, up to about 1 m long. *Leaves* ovate-cordate in outline, deeply 3–5–(7-) lobed, 2–10 cm long and a little less in width, on both surfaces rather sparsely setose-strigose, usually more densely so below, or in plants from very arid localities setose-scabrid to aculeate-scabrid with thicker bulbous based white stiff hairs, often glabrescent and turning punctate-scabrid; the lobes broadly elliptic to lanceolate obtuse to acute lobulate or coarsely dentate, sometimes finely so to subentire, separated by usually very distinctly rounded sinuses; central lobe the largest, often pinnatilobed, basal lobes much smaller, petioles hispid to aculeate, 2–8 cm long. *Flowers* monoecious, bright yellow. *Male flowers* solitary, fascicled or in a contracted raceme; receptacle narrowly campanulate, hirsute, usually 4–6 mm long; sepals subulate or filiform, 1.5–4 mm long; corolla 10–15 mm long (in specimens from arid localities, such as Little Namaqualand, calyx and corolla smaller). *Female flowers*: pedicels short or somewhat elongated, occasionally up to 6 cm long; calyx and corolla as in the male; ovary fusiform or oblong to narrowly ellipsoid, densely covered with bulbous-based setae soon developing into blunt conical protuberances carrying terminal thick setae. *Fruit* rather variable in size and shape, ellipsoid to oblong or sometimes subcylindric, more or less densely covered with flattened stout blunt conical-cylindric 5–10 mm long spines which are usually mucronate by the base of the setae originally terminating them, when ripe pale greenish white with broad purplish brown bands, consisting of a number of more or less completely fused dots and/or longitudinal streaks, 3–9 cm long and 2–4.5 cm in diam. *Seeds* 4.5–5.5 mm long, 2–2.5 mm wide and 0.75 mm thick.

Type specimen: Judging by the original description, the sole basis of the species seems to be "*Cucumis africanus echinatus minor*. *Hystrix vegetabilis vulgo*" Herm., Parad. Bot. 133, t. 134. Strangely enough the plate cited by the younger Linnaeus (t. 36, not 134) corresponds with p. 134, i.e. the description of "*Cucumis echinatus colocynthis folio*", not that of "*Cucumis africanus echinatus minor*", which name with the correct page number (133) was also cited by Linnaeus. One might contend that Linnaeus's name was based on heterogeneous elements and, therefore, a *nomen confusum*. On the other hand it is known that several of the plants dealt with in the "Supplementum Plantarum" were shown, or lent, to Linnaeus by Thunberg, but in all or the majority of such cases Linnaeus expressly mentions Thunberg's name and there is no reference to Thunberg in the original description of *Cucumis africanus*. As there is no actual type specimen, the specimen preserved in Hermann herbarium in BM—SLOANE must be regarded as a *typotype* and this specimen is, according to Mr. C. Jeffrey of Kew, to whom I am indebted for the information, undoubtedly the stripe-fruited plant known as *C. hookeri* Naud. Thunberg who was the first to use the name *Cucumis africanus* again had collected a plant and this specimen is still in the Thunberg herbarium at Uppsala, but his plant is the same as *C. zeyheri*. Naudin in his monograph of the genus *Cucumis* (1859) gave the first critical discussion and he was already aware of the uncertainties of Linnaeus's name. He declared, among other things, that this species is synonymous with *Cucumis africanus echinatus major* (sic! recte *minor*), *vulgo hystrix vegetabilis* Herm. Parad. Bot. p. 138 and, as far as he could see, not with "*C. echinatus Colocynthis folio* Herm. op cit., tab. 134". Naudin of course rightly assumed that Linnaeus had wrongly associated the plate (again incorrectly cited as "134", incidentally) with the description of a different plant, (Naudin's quotation is very inaccurate though, p. "138" instead of 133, "major" instead of "minor" and "vulgo hystrix vegetabilis" instead of "Hystrix vegetabilis vulgo"). However, this did not clear up the case. Naudin pointed out that several specimens collected in South Africa agree with Herman's description of *C. africanus echinatus major* which plant was said to have been grown from seed ex Africa, whereas *C. echinatus colocynthis folio* was a plant that appeared spontaneously and whose origin was unknown to Herman. Naudin suggested that the latter species might have been *Cucumis anguria* L., known in Europe for a long time and frequently cultivated (hence a possible subspontaneous appearance). All subsequent authors like Sonder in *Flora Capensis* and Cogniaux in his monographs follow Naudin's interpretation, which is unfortunate because practically all authors used the name *C. africanus* for the species with concolorous yellow fruits for which the valid name is now *C. zeyheri*.

SOUTH WEST AFRICA.—Kaokoveld: 22 miles S. of Ohopoho, *de Winter & Leistner* 5628 (PRE). Outjo: between Kamanjab and Outjo, *de Winter* 3070; Franzfontein, *Liebenberg* 4950a (PRE). Grootfontein: near Grootfontein, *Schoenfelder* S413; S447 (PRE). Omaruru: Brandberg, *Rodin* 2721 (PRE); also in (BOL) but wrongly labelled ("Otjiwarongo"). Okahandja: 15 miles from Okahandja on Windhoek road, *de Winter* 2698 (PRE). Swakopmund: Haikamchab, *Galpin & Pearson* 7508 (SAM). Windhoek: Kuiseb River Bed near Harris, *Pearson* 9510 (BOL); near Steinhausen (Farm Aurora), *de Winter* 2425 (PRE); halfway Windhoek—Okahandja, *de Winter* 2701 (PRE). Gobabis: Voolsangom, N.W. of Gobabis, *de Winter* 2450 (PRE); Sandfontein, *Wilman* Hb. no. 27030 (SAM); Omitara, *Liebenberg* 4570 (PRE). Rehoboth: Rehoboth, *Fleck* 703 (Z). Luederitzbucht: Aus, *Dinter* 6237 (B, BOL); Farm Landsberg, *Kinges* 2128 (PRE); Bethanien, Doorns, *Range* 1301 (SAM); Inachab, *Dinter* 973 (Z). Keetmanshoop: Löwenfluss (Chamob), *Fenchel* 41 (Z); Holoog, *Pearson* 9704 (BOL). Warmbad: Great Karasberg, *Narusdas-Süd*, *Pearson* 8219 (BOL); 15 miles N. of Karasberg, *Wilman* 270 (BOL, PRE). Locality not traceable: "Churumanus" (in Rehoboth distr.?): *Fleck* 505 (Z); without locality: *Fleck* 43 (Z).

BECHUANALAND.—Ngamiland: *Curson* 486 (PRE); Mabele a Pudi (N'Gami) *van Son* Hb. no. 28798 (PRE); Kaotwe, *van Son* Hb. no. 28803; Mochudi: *Rogers* 2352 (BOL).

CAPE.—Namaqualand: Goodhouse on Orange River, *Wilman* 256 (BOL); Aggenys, *Pearson* 12931 (BOL); Klipplaat, *Pearson* 3302; 3940 (BOL). Gordonia: Kalahari Gemsbok Nat. Park, *Story* 5579; *Leistner* 1133; *Brynard* 409 (PRE); Auob River in Gemsbok Game Reserve, *Kinges* 2004 (PRE); Gordonia, *Lewis* Hb. no. 53327 (SAM). Kenhardt: near Kenhardt, *Comins* 641; *Acocks* 18821 (PRE); Jagbult, 40 miles N.W. of Marydale, *Story* 1132 (PRE). Kuruman: 165 miles from Kuruman on road to Witdraai, *Story* 5478 (PRE); Kuruman, *Esterhuysen* 802 (BOL, PRE); *Lewis* Hb. no. 53505 (SAM); *Pole Evans* 2081 (PRE). Vryburg: Palmyra, 60 miles N.W. of Vryburg, *Rodin* 3677 (BOL, PRE); *Brueckner* 1103 (PRE). Barkly West: Daniel's Kuil, *Lewis* Hb. no. 54022 (SAM); Boetsap, *Acocks & Hafström* H1389 (PRE). Hay: Floradale, *Esterhuysen* 2432 (BOL). Kimberley: Magersfontein, *Wilman* Hb. no. 22011 (PRE); Herbert: Ramah, *Wilman* Hb. no. 576 (KMG); Honeynest Kloof, *Wilman* s.n. (PRE). Prieska: near Prieska, *Bryant* J. 282 (BOL, PRE, J); 285 (PRE). Hopetown: *Muskett* in Hb. Bolus no. 2407 (BOL). De Aar: Quaggafontein, *Acocks* 12606 (PRE). Calvinia: *Schmidt* 570; 575 (PRE). Williston: near Williston, *Theron* 1630 (PRE). Fraserburg: *Bolus* 10386 (BOL). Victoria West: Hazel Halt, near "Three Sisters": *Smith* 2488 (PRE). Prince Albert: Merweville, *Marloth* 13668 (PRE). Graaff-Reinet: Farm Rietvlei, *Galpin* 11511 (PRE). Somerset East: *I. L. Drege* 510; 679 (GRA).

TRANSVAAL.—Soutpansberg: Messina, *Rogers* 20797; 20999 (PRE); 21525 (GRA); *Moss & Rogers* 5050 (J, partly); s.n. (J, partly); Tshakoma, *Obermeyer* Hb. no. 30159 (PRE). Sibasa: Sibasa, *Junod* s.n. (PRE). Barberton: Komatipoort, *Moss & Rogers* 519 (GRA).

Also recorded from Southern Rhodesia.

This species has been confused in the more recent treatments of this family and in the South African herbaria with *C. zeyheri* and *C. myriocarpus* (= *C. dissectifolius*). It is quite distinct by its larger flowers and the morphology of the fruit. It is, for instance, extremely doubtful if *Cucumis zeyheri* or *C. myriocarpus* occur in South West Africa at all and in Bechuanaland Protectorate they are found only in the extreme south-east (Mochudi, etc.). All records of these species from South West Africa are, therefore mostly referable to "*Cucumis hookeri*" and partly to *C. ficifolius* (= *C. pustulatus*), a few perhaps to *C. kalahariensis*. The fruits of *C. africanus* occur in two not very sharply distinct forms, in a large oblong sycylindric shape and in a smaller, more ellipsoid one. These two shapes are rather well correlated with the taste: the large ones are a relished refreshment and source of water among South West African natives, whereas the smaller ones are usually bitter and poisonous. The actual condition is somewhat more complicated, because there are three types of fruits with increasing amounts of the bitter substance and one non-bitter form. The genetical implications of this variation are very interesting and are at present being studied by the Division of Horticulture, Pretoria. A similar case is *Cucumis metuliferus* which species also occurs in two forms, one with bitter unpalatable fruits and one with non-bitter edible fruits.

13. *C. myriocarpus* *Naud.* in *Ann. Sci. Nat.* 4me. sér. 11: 22 (1859); *Rev. Hort.* 106 (1860), cum ic.; *Sond.* in *Fl. Cap.* 2: 496 (1862); *Cogn.*, *Mon. Cucurb.* 502 (1881); *Pflanzenreich* 275.2: 150 (1924), emend. *Schweick.* in *S. Afr. Journ. Sci.* 30: 459 (1933); *Adamson and Salter*, *Fl. Cape Penins.* 739 (1950). Type: *Burke*, Vet River (K, holo!).

C. prophetarum sensu *Jacq.*, *Hort. Vindob.* 1, t. 9 (1770); *Thunb.*, *Fl. Cap.* ed. *Schultes* 36 (1823); Sér. in *DC.*, *Prodr.* 3: 301 (1828); *Schrad.* in *Linnaea* 12: 415 (1838); non *L.* (1755). *C. dissectifolius* *Naud.*, op. cit. 23 (1859); *Sond.*, op. cit. 496 (1862); *Cogn.*, op. cit. 492 (1881); 135 (1924); *Burt Davy*, *Fl. Transv.* 1: 229 (1926). *C. naudianus* *Sond.*, l.c., pro parte, excl. type. *C. africanus* *L.f.* var. *myriocarpus* (*Naud.*) *Burt Davy*, op. cit., 229. *C. merxmülleri* *Suesseng.* in *Trans. Rhodesia Sci. Assoc.* 43: 61 (1951).

Annual. *Stems* prostrate or occasionally twining at the ends, fairly slender, branched, angular-sulcate, at first pilose, later on the angles covered with short thick curved spinose setae later turning rough or scabrid, 0.5–2 m (usually 0.75–1.25 m) long. *Leaves* herbaceous to somewhat rigid, green or faintly canescent, in outline ovate or suborbicular to oblong, with a wide and shallow basal sinus, nearly glabrous and slightly scabrid or somewhat setose-pilose above, or sometimes densely so, more or less densely hirsute-setose or later scabrid below, 4–10 cm long and 3–7 cm wide, deeply or rarely shallowly palmately 3–7-lobed; the lobes variously dissected or lobulate but the ultimate segments usually rather narrow, rarely broad, often denticulate; petioles shortly and often densely aculeate-hispid, later usually scabrid, 2–10 cm long. *Tendrils* slender, usually short. *Flowers* monoecious. *Male flowers* fasciculate or by reduction solitary; pedicels filiform, shortly pilose, 0.5–3 cm long; receptacle hirsute, 3–5 mm long; sepals subulate, erect 1.5–2 mm long; petals pale yellow, slightly hairy, 4–6 (–8) mm long. *Female flowers* solitary; pedicels 1–5 cm long; ovary usually rather dark (blackish) when dry, sparsely to rather densely covered with soft spines. *Fruit* broadly ellipsoid to subglobose, when nearly ripe green with longitudinal dark blackish or purplish brown bands turning a bright brownish orange or rusty orange and less conspicuously striped when quite mature, covered with soft curved spines, 2–4.5 cm long and 1.5–3 cm in diam. *Seeds* numerous, pale yellow to white, oblong, 4–5 mm long, 2–2.5 mm wide, 1–1.5 mm thick.

Type: The status of *Cucumis myriocarpus* Naud. has been discussed by Schweickerdt who selected a type, viz., Jacquin's plate in Hort. Vindob. 1, t. 9 (1770), but this is not permissible because Naudin also cited a specimen retained in *C. myriocarpus* by Schweickerdt, hence the type is *Burke*, Vet River.

The distribution is not as one would expect from previous monographic treatments. The actual area is from Tanganyika and Southern Rhodesia through the Transvaal, southern Bechuanaland and Griqualand West to the eastern Cape Province and Natal. Not in South West Africa. Occurs as an introduction in the Cape Peninsula and occasionally in Europe and Australia.

Recorded from the following areas or districts: *Bechuanaland*: Mochudi; *Transvaal*: wide-spread, already recorded from practically all districts; *Orange Free State*: Boshoff, Hoopstad, Kroonstad, Bethlehem, Harrismith, Bloemfontein; *Natal*: Utrecht, Klip River, Bergville, Estcourt; *Basutoland*; *Cape Province*: Vryburg, Kimberley, Barkly West, Albert, Maclear, Sterkstroom, Queenstown, Fort Beaufort, Mount Currie, Umzimkulu, Graaff-Reinet, Uitenhage; also recorded from Albertinia (introduced?) and as an introduction on the Cape Flats.

The following specimens are of special interest: *Burke*, Vet River (Orange Free State, most probably Hoopstad district, fragment of type in PRE ex Herb. Hooker, K); *Burke* 276 from Mooi River (Potchefstroom, Transvaal, in SAM), isotype of *C. dissectifolius* Naud. The following gatherings were cited by Cogniaux (1924): Cape Province, Albert: *Cooper* 668 (BOL); Queenstown: Gwatyn, *Galpin* 2040 (GRA, PRE); Uitenhage: Zwartkops River, *Ecklon & Zeyher* 1793 (BOL); Cape Town: *Rehmann* 2189 (BR) (all cited as *C. myriocarpus*); Basutoland: *Junod* 2622 (Z); Transvaal, Johannesburg: Modderfontein, *Conrath* (Z) both as *C. dissectifolius*. Cited by Schweickerdt: Vet River, *Burke* s.n.; Queenstown, *Galpin* 2049. Orange Free State: Bethlehem, *Thorold* 11405; *Steyn* 14275; Boshoff, *Schweickerdt* 1101; Cape Province: Sterkstroom, *Galpin* 7726; Basutoland: *Watt & Brandwijk* 1825; Griqualand West, Kimberley, Riverton, *Wilman* s.n. (all PRE).

The species *Cucumis dissectifolius* and *C. myriocarpus* cannot be separated. Cogniaux (1924) keys them out as a perennial against an annual species, but there is no proof that "*C. dissectifolius*" is always a perennial (if ever). Of the two names, *C. myriocarpus* and *C. dissectifolius*, the first was selected for the aggregate because

it has page priority, it has been discussed in great detail in connection with the segregated species *C. leptodermis* by Schweickerdt, and it is the name that has been most generally used, not only in recent taxonomic works such as the "Flora of the Cape Peninsula", but also in other publications, e.g., in chemical papers. A substance extracted from the bitter fruits of this species has been referred to as "myriocarpin". It is felt that the adoption of *C. myriocarpus* would cause the least inconvenience.

Cucumis merxmulleri Suesseng. is, judging by the specimens from the type area, including topotypes compared with the type of *C. merxmulleri* at Munich, perfectly good *C. myriocarpus*. The specimens referred to the species *C. myriocarpus* or *C. dissectifolius* in various monographs and other publications do not all belong here. The specimens from South West Africa cited under these two species by Cogniaux, for instance, are referable to other species (*C. hookeri* Naud., *C. ficifolius* A. Rich. = *C. pustulatus* Hook. f.). The following specimens from South West Africa erroneously cited by Cogniaux in 1924 were studied: Range 1052 (cited as "1082", under *C. dissectifolius*) is *C. ficifolius* (= *C. pustulatus*); Schlechter 2279 and 9911 are probably *C. leptodermis*. Pearson 9570 (cited in Ann. Bolus Herb. 3, 1: 22 (1920) and by Cogniaux as *C. myriocarpus* is *C. africanus*. According to a note on a sheet in PRE this specimen agrees with Schaefer 375, which makes Schaefer 375 not "*C. dissectifolius*" but *C. africanus* L.f. (= *C. hookeri* Naud.).

It is interesting that Rehmann collected this species as early as 1881 in the Cape Flats where it still occurs as a weed.

14. *C. leptodermis* Schweick. in S. Afr. J. Sci. 30: 359 (1933). *C. myriocarpus* Naud. et Auct. plur., ex parte, exclus. type. Type: Schweickerdt 1244 from De Aar (Cape Province) in PRE (by original designation).

Annual monoecious prostrate herb. *Stems* several, branched, shortly scabrid, angular-striate, up to 1 m long. *Leaves* thinly herbaceous, dark green, nearly glabrous on the upper surface, hirsute-setose turning scabrid below, with a shallow rounded basal sinus, 3-5 (-7) cm in diam., 5- or sometimes 3- or 7-lobed; the lobes and the sinuses between them rounded; central lobe longer; margins dentate; petioles slender to robust, angular-striate, scabrid or shortly hispid, 1.5-9 cm long. *Tendrils* 3-5 cm long, scabrid. *Male flowers* solitary or fascicled; peduncle filiform, pilose, about 1 cm long; receptacle sparsely hirsute, 2.5-3 mm long; sepals subulate, 1-1.5 mm long; corolla slightly pubescent. *Female flowers*: ovary subglobose or broadly ellipsoid, with remote setae. *Fruit* on a 1-2.5 cm long peduncle, globose, sparsely covered with short soft spines, longitudinally zoned with darker and lighter green bands (the dark green bands with 1-4 soft spines, the lighter ones normally espinose), ultimately pale yellow, concolorous. *Seeds* pale yellow, ovate-oblong, 5-6 mm long, 2-2.5 mm broad, 1-1.5 mm thick.

Restricted in its distribution to the area indicated by the following citations. CAPE PROVINCE.—Kenhardt: Jagbult, 40 miles W. of Marydale, *Story* 1133 (PRE). Prieska: Prieska, *Bryant* J. 284 (PRE). Calvinia: Calvinia, *Smith* 2475 (PRE); farm Diepdrift, *Gill* 48 (PRE). Barkly West: Silverstream, *Esterhuysen* 799 (BOL, KMG, PRE). Kimberley: *Power* Hb. no. 22013 (PRE). Britstown: Britstown, *Schweickerdt* 1234 (PRE). De Aar: near De Aar, *Schweickerdt* 1244 (PRE, type); *Story* 1076 (PRE). Wellington: Wellington, *Marloth* 11869 (PRE, reported here as a weed). Worcester: Hex River near De Doorns, *Bolus* 13109 (BOL). Caledon: Villiersdorp, *Schlechter* 9911 (GRA, PRE). Victoria West: near Victoria West reservoir, *Smith* 2405. Murraysburg: Murraysburg, *Tyson* 290 (SAM). Middelburg: Middelburg, *Gill* 91; *Comins* 693 (PRE); Grootfontein, *Verdoorn* 1476; *Theron* 152 (PRE). Graaff-Reinet: 10 miles S. of Graaff-Reinet, *Bolus* 666 (BOL); probably Graaff-Reinet: Sneeuwberg, *Bolus* 666 (BOL). N.B.—This number "666" is found on two specimens

with different though approximate localities; Cogniaux (1924) also cites *Bolus* 666 as "Sneeuwberg", under "*Cucumis myriocarpus*". Aliwal North: Aliwal North, *F. Bolus* 39 (BOL); *Forbes* 540 (NH); *Steyn* Hb. no. 14272 (PRE); cultivated from seed ex Aliwal North in Pretoria, *Becker* 11418 (PRE). Adelaide: Adelaide, *Rogers* 4496 (GRA). The following two specimens probably also belong here. Albany: Klipdrift, *Schlechter* 2279 (GRA, J); Brakkloof, *White* 39 (GRA).

ORANGE FREE STATE.—Fauresmith: Fauresmith, *Smith* 4336A; Hartebeestfontein, *Verdoorn* 1398; Grapfontein, *Enslin* Hb. no. 28482; between Fauresmith and Philippolis, *Schweickerdt* 1284; Kafferfontein, *Kies* 309. Philippolis: Philippolis, *Enslin* Hb. no. 28483 (all PRE).

Cucumis leptodermis is very closely related to *C. myriocarpus*, both morphologically and biochemically. However, if complete specimens are available (with fruits) separation is apparently always possible by the characters mentioned in the key (taken from Schweickerdt's publication). *C. leptodermis* also has a somewhat different appearance—the lobes of the leaves are usually somewhat rounded and broad (often acute and narrow in *C. myriocarpus*), the stems and petioles are often stout (usually slender in *C. myriocarpus*), the petioles are relatively longer and the setae on stems and petioles are short, thickened at the base and usually very sparse on the stems and older petioles. This combination of characters may serve to distinguish non-fruiting specimens.

C. leptodermis hybridizes quite easily with *C. myriocarpus*, apparently not only after artificial cross-pollination, but also in nature. This also emphasizes the close relationship between the two and perhaps *C. leptodermis* is not more than a variety or a subspecies of *C. myriocarpus*. Quite typical fruiting specimens are always clearly separable and that is why, for the time being, *C. leptodermis* is kept up here as a species.

15. *C. anguria* L., Sp. Pl. ed. 1: 1011 (1753).

This species as originally circumscribed is apparently derived from a wild African species described as *C. longipes* Hook. and the two forms, differing slightly in the shape of the fruits and the development of the soft spines of the fruit, can for convenience be separated as varieties. For a discussion see A. Meeuse in *Blumea* Suppl. 4: 196–205 (1958).

(a) *C. anguria* L. var. *anguria*.

C. anguria L., l.c.; Sér. in DC., Prod. 3: 301 (1828); Naud. in Ann. Sci. Nat. 4me. sér. 11: 11 (1859); 12: 108 (1859); Griseb., Fl. Br. W. Ind. Isl. 288 (1860); Hook. f. in Bot. Mag. 96: t. 5817 (1870); Cogn., Mon. Cucurb. 501 (1881); Pflanzenreich 275.2: 148 (1924); A. Meeuse, l.c. 200 (1958).

Known only in a cultivated and semi-wild state in America.

(b) *C. anguria* L. var. *longipes* (Hook. f.) A. Meeuse, tom. cit., 200 (1958).

C. longipes Hook. f., Fl. Trop. Afr. 2: 543 (1871); Cogn., op. cit. 491 (1881); 135 (1924); Hiern, Cat. Afr. Pl. Welw. 1, 2: 396 (1898). *C. chrysocomus* sensu Welw., Apontam. Fl. Angola 586, 589 ("*chrysocharpa*", sphalm.); Hiern, op. cit., 396, non Schumach. & Thon. *C. figarei* Del. (Cat. Hort. Monspel.) ex Naudin var. *echinophorus* Naud. in Ann. Sci. Nat. 4me. sér. 11: 17 (1859); *C. figarei* Hook. f., op. cit. 543, ex parte, excl. syn. *C. ficifolius* A. Rich. and *C. abyssinicus* A. Rich.; *C. ficifolius* sensu Cogn. var. *echinophorus* (Naud.) Cogn., op. cit. 493 (1881); 139 (1924); sensu Hutch. et Dalz., Fl. W. Trop. Afr. 1: 182 (1927); sensu Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 174 (1950); sensu Keay, Fl. W. Trop. Afr. ed. 2, 11: 213 (1954).

Type of variety: The only specimen in Hooker's own herbarium named *Cucumis longipes* is *Welwitsch* 848 from Loanda, Angola, which was kindly sent on loan by the Kew herbarium. This is not such a good specimen as the two sheets of *Welwitsch* 848 (with fruits!) in BM.

Annual monoecious creeper. *Stems* up to 3 m long, branched, sulcate, shortly aculeate-setose or hispid. *Leaves* ovate or broadly ovate in outline 3–8 cm, occasionally up to 12 cm long and 2–6 (–10) cm wide, 3–5- or occasionally 7-lobed beyond the middle or rarely shallowly lobed, cordate at the base, the margin denticulate or callose-denticulate; the basal sinus as a rule broad and rather shallow, with the blade cuneately decurrent in the centre; both surfaces scabrid or shortly setose-scabrid, lower surface often more densely so and, in addition, setose-hispid on the slightly prominent main veins; the lobes usually broad, ovate or obovate to sub-orbicular, obtuse or rounded, often apiculate or mucronate, usually distinctly contracted at the base; the terminal lobe the longest (but not so distinctly longer as in *C. africanus* or *C. myriocarpus*), often lobulate; lateral lobes in 5-lobed leaves often somewhat spatulate or obcuneate, less often lobulate; basal lobes asymmetrical, somewhat falcate or with basal auricles rarely lobulate (in 3-lobed leaves the lateral lobes are more markedly falcate and auriculate); sinuses between the lobes rounded at the base; petioles usually rather stout, sulcate and setose-hispid, a little shorter to distinctly longer than the blade. *Tendrils* often stoutish and sulcate in lower portion, more slender and curvaceous in upper portion, setose-hispid. *Male flowers* solitary or fascicled; pedicels slender to almost filiform, up to 3 cm long, setose-hispid; receptacle obconical, narrowly campanulate, 4–6 mm long, shortly hispid, as are the filiform or subulate, 1.5–3 mm long sepals; corolla 6–9 mm long. *Female flowers* solitary on a 2–5 cm long, setose-hispid slender pedicel; receptacle and perianth as in the male; ovary ovoid to ellipsoid or subglobose, densely covered with soft setae each with a transparent pungent tip. *Fruit* on an incrassate, up to 18 cm long pedicel, ellipsoid to subglobose, concolorous, when ripe light yellowish green to light yellow (usually very densely), covered with long, thin soft spines with transparent tips, 3–5 cm long and 2–4 cm in diam. *Seeds* 5–6 mm long, 2–2.5 mm wide.

Occurs in west and central Africa, extending to South West Africa, the Transvaal and Natal.

SOUTH WEST AFRICA.—Kaokoveld: Ohopoho, *de Winter & Leistner* 5156 (PRE). Ovamboland: *Rodin* 2685 (BOL). Grootfontein: Okavango, Bunja (grown from seeds collected by Dr. Rapsom, in Pretoria), *Meeuse* 9618 (PRE); near Sambusi, *de Winter* 4944; near Grootfontein, *Schoenfelder* S618 (PRE); 30 miles from Grootfontein on road to Tsumeb, *de Winter* 2901 (PRE); farm Nutsas, *Volk* 400 (M). Karibib: Klein Ameib, *Dinter* 7093 (B). Okahandja: Okahandja, *Marloth* 1357 (PRE); *Dinter* 137 (SAM). Swakopmund: Haikamchab, *Galpin & Pearson* 7508 (PRE). Windhoek: farm Otijisawa, *Kräusel* 564 (M). Locality unknown but most probably Gobabis or Windhoek: “Farm Erichsfelde”, *Volk* 1769/1956 (M); Eckenberg–Erichsfelde, *Volk* 918/1956 (M).

BECHUANALAND.—Chukulu Pan between Ghanzi and Molepolole: *Story* 4938 (PRE). TRANSVAAL.—Soutpansberg: Dongola Reserve, *Codd* 4075 (PRE, SRGH). Pietersburg: Blaauwberg near Leipzig Mission Station, *Codd* 8715; Haenertsburg, *Moss & Rogers* 895 (J). Letaba: Shilouvane, *Junod* 2202 (PRE); Magoebaskloof, *Gerstner* 5393 (PRE). Potgietersrus: Ysterberg, N. of Potgietersrus, *Meeuse* 9752 (PRE). Waterberg: Naboomspruit: Mosdene, *Galpin* M134 (PRE). Lydenburg: Malipsdrift (cultivated in Pretoria from seed), *Meeuse* 9615 (PRE); Driekop, *Barnard & Mogg* 629 (PRE); *Meeuse* s.n. (from seeds, cult. in Pretoria); Farm Eersterecht, *Barnard & Mogg* 418 (PRE). Ermelo: farm Nooitgedacht 10, *Potter* in Hb. Henrici no. 1569 (PRE). Kruger National Park: The Gorge, *van der Schyff* 2288 (PRE); near Rabelais, *van der Schyff* 2349 (PRE); Ship Mountain, *van der Schyff* 1639 (PRE). Nelspruit: Plaston, *Holt* 202 (PRE, NH). Barberton: Komatipoort, *Burt Davy* 374 (BOL). SWAZILAND.—Mbabane, *Bolus* 11896 (BOL).

NATAL.—Newcastle: Charlestown, *Wood* 5737 (NH). Nongoma: *Gerstner* 4688 (PRE); “Zululand”: *Gerstner* 2474 (NH). Mtunzini: *Mogg* 5973. Inanda: *Wood* 425 (NH). Durban: Isipingo Beach, *Ward* 1014 (PRE).

Also recorded from many places in Southern Rhodesia, from Bulalima–Mangwe in the south-west to Umtali in the east and to Urungwe in the Zambesi valley, from Mazabuka in Northern Rhodesia and several localities in Portuguese East Africa, its range apparently extending through the Belgian Congo to tropical Africa and to Nyasaland.

This plant was confused with *C. ficifolius* A. Rich., which latter name must be used for the plants better known as *C. pustulatus* Hook. f. This confusion started probably because Naudin took up an old invalidly published name (*C. figarei*) and included several forms of which Naudin's variety *echinophorus* at least partly agrees with *C. longipes*. Cogniaux took over Naudin's arrangement including the var. *echinophorus* but used the oldest validly published synonym for the complex. Others have also used the name *ficifolius* to denote the *annual* form with long peduncles and very densely softly spinose fruits. *C. figarei* is clearly a synonym of *C. ficifolius* A. Rich. (non alior.!) and falls away. The name *C. longipes* is available and is used here in preference to the var. *echinophorus* of Naudin.

Cucumis chrysocomus Schumach. & Thonn. was cited by Welwitsch and by Hiern for a species of *Cucumis* which is referable to *C. anguria* var. *longipes*. Mr. Killick kindly informed me that the photo of the type in K (also studied by Mr. Hemsley, at the time working on African Cucurbitaceae) shows clearly that *C. chrysocomus* is not a *Cucumis* but a species of *Raphidiocystis* (*R. caillei*). The combination in the latter genus is, therefore, now made.

Raphidiocystis chrysocoma (Schumach. & Thonn.) Killick & A. Meeuse, comb. nov.—*Cucumis chrysocomus* Schum. et Thonn., Beskr. Guin. Pl. 427 (1827–1829); in Dansk. Vid. Selsk. Skrift. 4: 201 (1829); non alior. *Raphidiocystis caillei* Hutch. & Dalz., Fl. W. Trop. Afr. ed. 1, 1: 180 (1927), nomen tantum, in Kew Bull. 1928: 215, descr. et Fl. W. Trop. Afr. ed. 2 (Keay), 1, 1: 215 (1954).

16. *C. zeyheri* Sond. in Fl. Cap. 2: 496 (1862); Cogn., op cit., 505 (1881): 152 (1924). Type: Zeyher 582, 583 (S, syns.).

C. africanus sensu Thunb., Prodr. Pl. Cap. 13 (1794); Fl. Cap. 156 (1811); Ser. in DC., Prodr. 3: 301 (1828); sensu Schrad. in Linnaea 12: 415 (1838); sensu Naud. in Ann. Sci. Nat. 4me. sér. 11: 20 (1859); sensu Sond. in Fl. Cap. 2: 495 (1862); sensu Cogn., Mon. Cucurb. 504 (1881); Pflanzenreich 275.2: 151 (1924); sensu Burt Davy, Fl. Transv. 1: 228 (1926); non L. f. *C. arenarius* Schrad. in Linnaea 12: 416 (1838); Naud. op cit., 83 (1859); non Schum. & Thonn. *C. africanus* Linn. f. var. *acutilobus* Cogn. in Bull. Herb. Boiss. 3: 418 (1895); Pflanzenreich 152 (1924). *C. africanus* Linn. f. var. *zeyheri* (Sond.) Burt Davy, op. cit., 229.

Herb with woody perennial thin roots. *Stems* several, annual, prostrate, very rarely climbing, usually slender, branched, angular, scabrid or coarsely setose to aculeate mainly on the angles, up to about 2 m long. *Leaves* usually green, herbaceous but often firm, ovate or elliptic to oblong in outline, truncate to subcordate or broadly rounded at the base, deeply palmately 3–5-lobed, 2.5–10 cm long and 2–7 cm wide; the lobes acute to obtuse, lanceolate, broadly linear or broader, rotundate to obovate or ovate-oblong, the margins finely denticulate to coarsely dentate or lobulate, the middle lobe usually distinctly longer than the others, often lobulate; both surfaces scabrid or shortly setose-aculeate often ultimately scabrid-punctate, if so, often white-punctate, usually shortly hispid-setose on the nerves below; petioles shortly setose-hispid to finely aculeate, often turning scabrid, 0.5–8 cm long. *Flowers* monoecious. *Male flowers*: pedicels solitary or fascicled, filiform, shortly hispid, 0.5–2 cm long; receptacle narrowly campanulate, shortly hirsute-setose, 3–4 mm long; sepals subulate, erect, 1–4 mm long; corolla slightly pubescent, 3–5 mm long. *Female flowers*: pedicels

almost invariably under 3 cm long; ovary narrowly ellipsoid to oblong, densely covered with thick soft setae. *Fruit* ellipsoid, when ripe concolorous, light yellow, covered with soft rather short (under 5 mm long) to very short soft spines, 4–6 cm long, 2–4 cm in diam. *Seeds* 4.5–5 mm long, about 2.5 mm broad, slightly over 1 mm thick.

Occurs in South Africa, from Griqualand West southwards and south-eastwards to the eastern Cape Province, Orange Free State, Natal and extends northwards to Southern Rhodesia and Portuguese East Africa, perhaps even to tropical East Africa, but up to now not found in South West Africa or Angola, as wrongly stated by Cogniaux in his monographs. Not recorded from Bechuanaland Protectorate but to be expected in the extreme south and eastern parts.

Recorded from the following: *Cape Province*: Clanwilliam?, Vryburg, Taungs, Barkly West, Kimberley, Hay, Aliwal North, Graaff-Reinet, Uitenhage, Port Elizabeth, Albany, Victoria East, Queenstown, East London, Stutterheim, Komgha, Kentani, Mount Currie; *Transvaal*: practically all districts except the extreme south-west and extreme south-east; *Swaziland*; *Orange Free State*: recorded only from the Senekal and Fauresmith districts, but it must be more widespread; *Zululand* (wide-spread) and *Natal*: Bergville, Klip River, Estcourt, Weenen, Lions River, Pietermaritzburg, Camperdown, Richmond, Pinetown, Durban, Port Shepstone; *Basutoland*. The following specimens are of special interest:

CAPE PROVINCE.—*Ecklon & Zeyher* 1795, said to be from Onderbokkeveld, Clanwilliam (SAM, isotype of *C. arenarius* Schrad. non Schum. & Thonn.). Uitenhage: *Ecklon & Zeyher* 1794 (SAM, cited by Sonder & Cogniaux). Aliwal North: Wildschutsberg, Drege (L.). Graaff-Reinet: Zondags River, Drege (PRE).

TRANSVAAL.—Letaba: Shilovane, *Junod* 2556 (Z, cited by Cogniaux & Harms 1924 as *C. zeyheri*); Pietersburg: Houtbosch, *Rehmann* 6311 (BR). Barberton: *Galpin* 942 (PRE), these numbers cited by Burt Davy under *C. africanus*. Lydenburg: *Wilms* 497 (PRE, cited by Burt Davy as *C. africanus*, by Cogniaux & Harms, erroneously as “494” as *C. zeyheri*).

NATAL.—Durban: *Gueinzus* (probably no. 398, cited by Cogniaux 1881 and Cogn. & Harms as *C. zeyheri*). Lions River: Howick, *Junod* 182 (Z); Umkomanzi (Umkomaas) River, *Schlechter* 6684 (GRA), both cited by Cogn. & Harms as *C. zeyheri*.

PORTUGUESE EAST AFRICA.—Sul do Save: Ressano Garcia, *Schlechter* 11894 (GRA), cited by Cogniaux & Harms as var. *acutilobus* Cogn. (together with *Rehmann* 6311 from the Transvaal, see above).

Although the actual syntypes of *Cucumis zeyheri* were not available for study, a *Gueinzus* specimen from Durban, referred to *C. zeyheri* by Sonder with some doubt, was seen and several other specimens referred to “*C. zeyheri*” by Cogniaux leave no doubt about the identity with *C. africanus* sensu auct. non L.f. As a matter of fact, Cogniaux, p. 119 (1924), keys out the two on the shape of the lobes of the leaves, (those of “*africanus*” with broad lobes rounded at the apex, those of *zeyheri* with lanceolate acute lobes), but at the same time upholds a var. *acutilobus* of “*C. africanus*” (p. 152), which is, therefore, indistinguishable from *C. zeyheri*. The fruit of *C. zeyheri* was described as “pyriform-globose” by Sonder which description was copied by Cogniaux (1881, 1924), but this is fallacious and it must have been either an abnormal fruit or the way it was preserved. Plants agreeing with “*C. zeyheri*” bear the same ellipsoid yellow fruits as “*C. africanus*” sensu auct. non L.f.

The fruits are very bitter and are used in native medicine as a (very drastic) purgative, but this has led to several cases of poisoning through taking an overdose.

C. zeyheri is without any doubt a perennial. Specimens in cultivation have been growing for nine years already. Reports in the literature that it is an annual species (e.g., Cogniaux 1924) are erroneous or are based on related annual species confused with it (*C. myriocarpus*, *C. anguria* var. *longipes* and the true *C. africanus* L.f. = *C. hookeri* Naud.).

17. *C. ficifolius* A. Rich., Tent. Fl. Abyss. 1: 294, t. 53 bis (1847), non alior. Type: *Quartin Dillon*, from Abyssinia, in P (photo. in PRE!).
C. pustulatus Hook. f. in Fl. Trop. Afr. 2: 544 (1871); Cogn., Mon. Cucurb. 495 (1881); Pflanzenreich 141 (1924); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 182 (1931); Andrews, Flow. Pl. Anglo-Egypt. Soudan 1: 172 (1950). *C. abyssinicus* Schimp. ex Hook. f., l.c., in syn., non A. Rich.

Perennial prostrate monoecious herb. *Stems* several from a woody rootstock, rather firm and rigid, elongate, branched, sulcate, armed with short white thick spines. *Leaves* rather rigid, cordate-ovate to cordate-oblong in outline, canescent, scabrid, pedately-palmately 3-5-nerved from the base, 4-11 cm long and 3-9 cm wide, entire or 3-lobed to deeply 5-fid, lobes obtuse, entire or denticulate, sometimes lobulate; petioles rather stout, very scabrid, 2-5 cm long. *Tendrils* usually stout, shortly hispid-setose. *Male flowers* solitary or 2-3 together, pedicels filiform shortly hispid-setose, about 1 cm long; receptacle sparsely hirsute, about 5 mm long; sepals subulate or narrowly triangular to lanceolate, about 2 mm long; petals puberulous, ovate-oblong, obtuse, 6-7 mm long. *Female flowers* solitary, peduncles rather short, 1-3 cm long, in fruit ultimately attaining 5-10 cm; ovary with thick short spines. *Fruit* broadly ovoid to subglobose, concolorous, in sicco turning yellowish-brown, glabrous when mature, sparsely covered with short hemispherical protuberances representing the bases of the spines of the ovary, 5-8 cm long and 4-6 cm in diam. *Seeds* whitish to pale yellow, oblong, 6 mm long, 2.5-3 mm wide and 1.5 mm thick.

Found in Mauretania, Sudan and Nubia to Somaliland and Arabia, extends into tropical East Africa, also in Angola and South West Africa.

SOUTH WEST AFRICA.—Kaokoveld: Ohopoho, *de Winter & Leistner* 5157 (PRE). Ovamboland: Olukonda, *Schinz* 308 (Z). Grootfontein: Karakowisa, *Schoenfelder* 10; *de Winter* 3713 (PRE). Okahandja: *Dinter* 138 (PRE, SAM). Karibib: *Kinges* 3451 (PRE). Windhoek: Voigtskirch, 35 miles N.E. of Windhoek, *de Winter* 2392 (PRE); 8 miles W. of Seeis, *Codd* 5812 (PRE); Windhoek, *Gillman* 2 (SAM); Avisdamm, *Liebenberg* 4505 (PRE); Osona, *Dinter* 126 (PRE, SAM); farm Hohenwarte near Windhoek, *Steyn* Hb. no. 22544 (PRE); between Haris and farm Hoffnungsfelde, *Pearson* 9526 (BOL); Hoffnungsfelde, *Pearson* 9586 (BOL); Rehoboth, Buellspport, *Dinter* 8349 (B). Bethanien: *Kuperas Range* 1052 (SAM). Lüderitzbucht: *Aus, Schinz* 299 (Z). Hereroland: *Luederitz* 134 (Z).
 CAPE.—Barkly West: Newlands, *Wilman* Hb. no. 1552 (KMG). Probably Hay: Paardekloof, *Cooke* Hb. no. 6656 (KMG). De Aar: near Houtkraal Station, *Acocks* 18831 (PRE).

This species is better known under the name *C. pustulatus* Hook. f. The confusion started with Naudin who took up an invalidly published name by Delisle ("Cat. hort Monspel."), and published a description as *Cucumis figarei* Del. ex Naud. in Ann. Sci. Nat. 4me sér. 11: 16 (1869). "*C. figarei*" includes many forms among them A. Richard's *Cucumis ficifolius*, the latter as var. *ficifolius*. Cogniaux and others used the name "*C. ficifolius*" as a substitute for Naudin's name *C. figarei* and for a long time the current application of the name "*C. ficifolius*" was to a plant which was described by Hooker as *Cucumis longipes*, an annual. If one goes back to Richard's description, it is quite clear that the type of *C. ficifolius* is characterised by short fruiting peduncles and short (reduced) tendrils. Richard described the fruits as "piloso-echinatis", but the plate shows a fruit with short warty protuberances. Moreover, Richard, in a note under the description, clearly pointed out the differences between "*C. ficifolius*", *C. prophetarum* and *C. africanus*. "Elle diffère de la . . . seconde (i.e., *C. africanus*) par les lobes de ses feuilles très-obtus, par ses pedoncles courts et ses fruits non hérissés de piquants". Naudin, when discussing *C. figarei*, mentioned that he did not see any mature fruits on the specimens named *C. ficifolius* by Richard, but he stated that he thought the mature fruits would not have long soft spines when

mature and he made a variety "*C. figarei cyrtopodus*" for this form. Hooker may have been confused by some of Naudin's conclusions and described the plant again as *Cucumis pustulatus*. The type (Quartin Dillon) of *C. ficifolius* appears to me a good match of Hooker's *C. pustulatus* and must be taken up. This is rather unfortunate, because the name "*C. ficifolius*" has been used for other species (at least for *Cucumis longipes* = *C. anguria* var. *longipes*, see no. 15b) by Cogniaux and others, but there is no other course. Richard's name *C. abyssinicus* is of the same date as *C. ficifolius* and Hooker, when describing *C. pustulatus*, mentioned that this might be the same as his *C. pustulatus* (he also mentioned *Cucumis striatus* A. Rich. but, according to Cogniaux, this is *Coccinia adoensis* and can be disregarded). However, Hooker also cited "*C. abyssinicus* Schimp. H.C. Abyss. n. 412 (1853 ex herb. Mus. Par.) in A. Rich. Fl. Abyss. I, 294", which is incorrect because Richard, l.c., only cites *Cucumis abyssinicus* Nobis and does not mention Schimper nor a Schimper specimen (he mentions Quartin Dillon as the collector). *Schimper* 412 from Abyssinia is cited by Cogniaux as *Melothria punctata*, another *Schimper* 412 from Yemen, Arabia, is *C. pustulatus* (K, teste Killick). At any rate, *C. abyssinicus* A. Rich. apparently has striped fruits and, therefore, cannot be the same as *C. ficifolius* A. Rich.

13. LAGENARIA

Lagenaria Ser. in Mem. Soc. Phys. Genève 3, 1: 25, t. 2 (1825); in DC., Prodr. 3: 299 (1828); Naud. in Ann. Sci. Nat. 4me. sér., 12: 91 (1859); Sond. in Fl. Cap. 2: 489 (1862), ex parte; Benth. & Hook. f., Gen. Pl. 1: 823 (1868); Hook. f., Fl. Trop. Afr. 2: 529 (1871); Cogn., Mon. Cucurb. 417 (1881); Pflanzenreich 275.2: 200 (1924); Baill., Hist. Pl. 8: 443 (1886); Pax in Pflanzenfam. 4, 5: 29 (1889). *Sphaerosicyos* Hook. f. in Benth. & Hook. f., op cit., 824 (1868); op cit., 532 (1871); Cogn., op. cit., 466 (1881), 99 (1924); Pax, op. cit., 26; Phillips, Gen. ed. 2: 748 (1951). *Sphaerosicyos* Post. & O. Ktze., Lex. 528 (1903).

Annual or perennial scandent or prostrate plants with musk scent. *Stems* long, branched, firm, sometimes rooting at the nodes. *Tendrils* bifid or very rarely simple. *Leaves* entire, angular or lobed to deeply palmately dissected, the margin dentate; petioles with 2 sessile or stalked glands at the apex which are rarely wanting. *Flowers* monoecious or dioecious, rather large, all solitary or the male racemose. *Male flowers*: receptacle shallow to narrowly campanulate or turbinate; sepals small, remote; corolla rotate to saucer-shaped; petals free or nearly so, oblong-obovate; stamens 3, free; filaments short; two anthers 2-theous, the third 1-theous; thecae very much folded; connective not produced at the apex beyond the anthers, usually broad and flat; rudimentary pistil 0 or represented by a gland. *Female flowers*: perianth as in the male; staminodes 3, small or minute; ovary ovoid to ellipsoid or subglobose, tomentose or hairy, with 3 placentas and numerous horizontal ovules; style columnar or cylindrical, short or very short; stigmas 3, fleshy, bilobed. *Fruit* indehiscent, subglobose to oblong, pyriform, ellipsoid or irregularly shaped with usually a long, often bent, "neck" with a leathery to bony pericarp and many seeds embedded in a spongy pulp. *Seeds* triangular-oblong to obovate or elliptic, compressed, truncate to sub-bidentate, rarely rounded at the apex, smooth, marginate; testa tough, leathery to bony; tegmen membranous; cotyledons, elliptic, radicle conical, subacute.

Type species: *Lagenaria vulgaris* Ser. = *Cucurbita lagenaria* L. = *Lagenaria siceraria* (Molina) Standl.

Two species, both occurring in southern Africa. The type species, now circumtropical, is most probably also of African origin.

The monotypic genus *Sphaerosicyos* Hook. f., here reduced to *Lagenaria*, differs from the type species of *Lagenaria* in its perennial habit and the normally dioecious (as against monoecious) flowers. The other morphological characters agree very well, even in rather unusual details such as the glands at the apices of the petioles and the shape of the seeds. Additional arguments for this reduction are in the first place the fact that fertile hybrids between *Lagenaria siceraria* and "*Sphaerosicyos*" have often been recorded (see, for instance Cogniaux & Harms in *Pflanzenreich* 275.2: 101). At the Roodeplaat Experimental Station of the Division of Horticulture near Pretoria Dr. Rehm observed spontaneous hybridization between the two and found in addition that artificial cross-pollination yielded about as many successful fertilisations as artificial pollination of the flowers of one species with its own pollen. The F₁-generation produced fertile seeds which germinated as readily and as quickly as those of the parent plants, whereas most interspecific crosses between members of one genus in the Cucurbitaceae are already sterile in the F₁-generation and do not produce viable seeds.

Another interesting fact discovered by Dr. Rehm is that the same bitter substances in approximately the same relative quantities occur in the fruits of *Sphaerosicyos* and of bitter forms of *Lagenaria siceraria*. This combination of substances and relative quantities is rather typical of *Lagenaria* and *Sphaerosicyos* whereas this constellation is not found in the other Cucurbitaceae examined in this respect.

Monoecious; male flowers always solitary; leaves undissected, glands on petiole small; whole plant densely and softly pubescent; usually cultivated annual, sometimes running wild but probably also indigenous..... 1. *L. siceraria*
 Normally dioecious; male flowers usually racemose; leaves usually palmatisect, glands on petiole conical or subcylindric; plant usually not densely pubescent all over; not cultivated, perennial..... 2. *L. mascarena*

1. *L. siceraria* (Molina) Standl. in *Field Mus. Publ., Bot. Ser.* 3: 435 (1930); Andrews, *Flow. Pl. Anglo-Egypt. Soudan* 1: 175 (1950).

Cucurbita lagenaria L., *Sp. Pl.* ed. 1, 1010 (1753). *C. siceraria* Molina, *Sagg. Chil.* 133 (1782), ed. 2, 316 (1810); *Ser. in DC., Prodr.* 3: 318 (1828). *C. leucantha* Duch. in *Lam., Enc. Meth.* 2: 150 (1786).

Lagenaria vulgaris Ser. in *Mém. Soc. Phys. Genève* 3, 1: 25, t. 2 (1825), and op cit. 299 (1828); *Sond. in Fl. Cap.* 2: 489 (1862); Hook. f. in *Fl. Trop. Afr.* 2: 529; Cogn., *Mon. Cucurb.* 417 (1881); *Pflanzenreich* 275.2: 201 (1924); Hutch. & Dalz., *Fl. W. Trop. Afr.* 1: 176 (1931); Robyns, *Fl. Spermat. Parc. Nat. Albert* 2: 399 (1947). For full synonymy see Cogniaux (1881, 1924).

Type: The description by Molina was based on material from South America. It is doubtful whether a type specimen exists, but the name *Lagenaria siceraria* is nowadays generally accepted as being correct.

Circumtropical (but apparently of African origin), usually as a cultigen.

Annual, prostrate or climbing softly hairy herb. *Stems* angular, thick. *Leaves* suborbicular-cordate, softly herbaceous, angular or faintly 3-lobed, obtuse or acute at the apex and with a broad basal sinus, 10–40 cm long and as wide; the margin dentate; the 5–7 pedately arranged nerves prominent below; petioles rigid, straight, thick, cylindric, often hollow, 5–30 cm long with sessile glands at the apex. *Flowers* solitary. *Male flowers*: peduncle usually exceeding the petioles; receptacle narrowly campanulate-funnelshaped, 2–3 cm long; sepals narrowly triangular; petals crisped, pubescent or tomentose, thickly 5-nerved, 3–4 cm long and 2–3 cm wide. *Female flowers*: peduncle usually shorter than in the male flower; ovary ovoid to cylindric, densely long-villous. *Fruit* variable in shape and size, ultimately glabrous, green at first, turning whitish or yellowish at maturity, 10–80 cm long and up to 20 cm in diam., often with a narrow "neck" and/or a constriction near the stalk. *Seeds* 7–20 mm long.

Cultivated by the natives in South Africa for its fruits (Calabashes) of which the hard outer layers are used for containers and to make dishes, spoons, etc.; the fruits of some forms with non-bitter fruits are also used as a vegetable when young (local names of these forms are "doody" and "maranka", which names may be of Indian origin).

A few records of *L. siceraria* from areas where escapes from cultivation are most unlikely suggest that this plant also occurs wild in Southern Africa. Examples are, for instances, *Codd & de Winter* 5583 from near Letaba Camp, Kruger National Park, Letaba district; *Codd* 4283 from near Olifants River Camp, Kruger National Park, Pilgrims Rest district; *Rogers* 367 from Nelspruit; and *Burt Davy* 10649 from Swaziland (all in PRE).

2. *L. mascarena* Naud. in Ann. Sci. Nat. 4me. sér. 18: 187 (1862).

L. sphaerica E. Mey. ex Drege, Zw. Pflzgeogr. Doc. 197 (1843), nomen tantum; ex Naud. in Ann. Sci. Nat. 5me. sér. 5: 9 (1866). *L. sphaerocarpa* E. Mey. ex Arnott in Hook. f., London J. Bot. 3: 277 (1841), nomen tantum.

Luffa sphaerica E. Mey. ex Sond. in Fl. Cap. 2: 490 (Oct. 1862); Wood, Natal Pl. 3: t. 289 (1902).

Sphaerosicyos meyeri Hook. f. in Fl. Trop. Afr. 2: 532 (1871). *S. sphaericus* (E. Mey. ex Naud.) Cogn., Mon. Cucurb. 466 (1881); Pflanzenreich 275.2: 99; Engl., Pflanzenwelt O.-Afr., C: 398 (1895); Robyns, Fl. Spermat. Parc Nat. Albert 2: 397 (1947)

Type: Naudin did not mention any specimens in his original description, but stated "In insulis Mayotte, Nossi-Bé . . .". The description starts with "Planta in Horto parisiensi 10-metralis . . ." and most probably Cogniaux was correct when he stated (Pflanzenreich 275.2: 100): "*Lagenaria mascarena* wurde begründet auf in Paris kultivierte männliche Exemplare aus Mayotte". The type material was not available for study, but there is no reason to question Cogniaux's reduction of *Lagenaria mascarena* to *Sphaerosicyos sphaericus*. At any rate, specimens from the Comores and Madagascar are indistinguishable from South African material (typified by a *Drege* gathering from southern Natal).

Perennial. *Stems* angular-sulcate, nearly glabrous to subtomentose, up to 10 m long and over. *Leaves* rather rigid, pergamaceous when dried, ovate-cordate to sub-orbicular in outline, varying from shallowly 5-lobed-5-angled to deeply (more than half-way) palmatisect, 5-18 cm long and as wide, on both surfaces shortly setose-scabrid and on lower surface sometimes subtomentose; upper surface dark green, lower surface paler; lobes usually irregularly and coarsely dentate or dentate-serrate to somewhat pinnati-lobed, the teeth callous-mucronate; apices of lobes usually acuminate, ending in a long slender mucro; basal lobes sometimes obliquely bilobed; sinuses between the lobes rounded; basal sinus usually wide and shallow with the blade broadly cuneately decurrent in the middle; petioles firm, striate-sulcate, 2-8 cm long; glands firm, up to 2 mm long; an axillary bract-like organ sometimes developed, linear, up to 2 cm long. *Male plant*: common peduncle glabrous, up to 10-flowered, 5-15 cm long; pedicels 7-30 mm long; bracts minute or small, petiolulate, triangular; receptacle 3-4 mm high and 9-12 mm in diameter, pubescent; sepals varying from lanceolate-subulate to subquadrate, 2-4 mm long and 1-2.5 mm wide, usually acute and distant, petals white, green-veined, papillose, 2.5-4.8 cm long; filaments up to 8 mm long; anthers 6-8 mm long and 5-8 mm wide, yellow. *Female plant*: peduncle 2-5 cm long; ovary subglobose to ovoid or ellipsoid, densely tomentose, 12-15 mm long; style about 1 cm long. *Fruit* dark green mottled with lighter green, greyish green, white or greenish-yellow, subglobose to subglobose-oblong, or broadly ovoid, obovoid or ellipsoid, 7-11 cm long and 6-10 cm in diam. *Seeds* whitish to yellowish, 11-14 mm long, 4-6 mm wide and 2-3 mm thick.

Occurs in east tropical Africa, from Tanganyika to the northern Transvaal and through Natal to the coastal districts of the Cape Province as far as Knysna, and extends to the Rhodesias and Angola. Also in the Comores and in Madagascar.

TRANSVAAL.—Soutpansberg: Dongola, near Limpopo River, *Verdoorn* 2120 (PRE). Sibasa: *van Warmelo* 5337/21 (PRE); near Makonda, *Codd* 6829 (PRE, SRGH); *Munro* s.n. (PRE, SRGH); Pafuri, Kruger National Park, *van der Schijff* 3042 (PRE); *van der Schijff & Marais* 3720 (PRE). Barberton: Komatipoort, *Rogers* s.n. (GRA). NATAL.—Eshowe: *Lawn* 406; 442 (NH). Lower Tugela: Stanger Beach, *Pentz & Acocks* 10419 (NH). Pietermaritzburg: *Smith* s.n. (PRE). Durban: Redhill, Prospect, *Forbes* 274 (NH); near Durban, *Rehmann* 8845 (BR, Z); *Conrath* 754 (Z); *Wood* 953 (GRA) and most probably the same number (same date on label) in BOL, GRA, PRE and no. 1461 in Herb. *MacOwan* (PRE); 3269 (NH); Berea, *Wood* 5269; 5270 (NH); *Galpin* 12117 (BOL, PRE); Umbilo, *Marriott* Hb. no. 22586; 22587 (NH); Isipingo Beach, *Ward* 842 (NU, PRE). Pinetown: Umkomaas, *van Oosterwijk & Bruin* 234 (PRE). Umzinto: Dumisa, Ifafa Valley, *Rudatis* 1003 (L); *Gerstner* 6810 (PRE). Port Shepstone: Shelly Bay, *Mogg* 12738 (PRE). Southern Natal, probably Umzinto (between the Umzimkulu and the Umkomaas): *Drege* s.n. (L, isotype of *Luffa sphaerica* Sond. = *Sphaerosicyos sphaericus* Cogn.). CAPE PROVINCE.—Port St. Johns: Isnuka, *Galpin* 3442 (BOL, GRA, PRE); Port St. Johns, *Schonland* 4033 (GRA); *Bolus* 8911 (BOL); *Leighton* 2969 (BOL, PRE); *Pahl* Hb. no. 25385 (BOL, PRE). Willowvale: Willowvale, *Rayment* Hb. no. 6141 (KMG). Kentani: near Kentani, *Pegler* 154 (PRE). Komgha: Kei Mouth, *Flanagan* 1155 (BOL, GRA, PRE); s.n. (PRE, SAM). East London: *Ratray* 1356 (PRE). Alexandria: Langebosch Forest Reserve, *Story* 3244 (GRA, PRE); *Archibald* 4479 (b) (PRE). Knysna: *Theron* 989 (PRE); *Duthie* 845 (BOL, GRA); 15 miles W. of Knysna, *Peacock* Hb. no. 66636 (SAM, PRE); near Goukamma, *Fourcade* 3929 (BOL). PORTUGUESE EAST AFRICA.—Sul do Save: Lourenco Marques, *Junod* 371 (PRE); *Gomes & Sousa* 3751 (COI, PRE); near Licifo, *Pedro & Pedrogao* 1414 (PRE); also recorded from the northern provinces.

14. TROCHOMERIA

Trochomeria Hook. f. in Benth. & Hook. f., Gen. Pl. 1: 822 (1867); in Fl. Trop. Afr. 2: 524 (1871); Harv., Gen. S. Afr. Pl., ed. 2: 124 (1868); Cogn., Mon. Cucurb. 394 (1881); Pflanzenreich 275.2: 184 (1924); Pax in Pflanzenfam. 4, 5: 29 (1889); Burt Davy, Fl. Transv. 1: 224 (1926); Phill. Gen. ed. 2: 750 (1951). *Heterosicyos* Welw. ex Benth. & Hook. f., l.c. and in Trans. Linn. Soc. 27: 33 (1896); Hook. f. in Fl. Trop. Afr. 2: 525 (1871). *Gymnopetalum* sensu Baill., Hist. Pl. 8: 445 (1886), ex parte, exclus. type species.

Type species: T. hookeri Harv.

Perennials with tuberous, sometimes large roots and, in the section *Trochomeria* (= *Eutrochomeria* Cogn.), slender prostrate or climbing usually annual stems with simple tendrils, in the section *Heterosicyos* (Welw. ex Benth. & Hook. f.) Cogn., erect stems without tendrils. *Leaves* usually shortly petiolate, palmately lobed or dissected, less often undivided, at the base of the petiole sometimes bearing a stipuliform dentate to fimbriate sessile or subsessile bract. *Flowers* dioecious, often greenish-yellow, sometimes precocious; the male ones solitary, fascicled or in racemes, the female ones solitary. *Male flowers*: receptacle tubular, funnel-shaped, cylindrical or campanulate, very often elongated; sepals very small, ovate, linear, or subulate; corolla usually rotate; sometimes funnel-shaped in lower portion and the remainder spreading; petals ovate-triangular to linear-lanceolate or linear-subulate; stamens 3, inserted at the middle or the base of the receptacle, two 2-theous and the third 1-theous; filaments terete about as long as or longer than the anthers, rarely (in *T. sagittata*)

very short; connective papillose or ciliate at the apex; anthers longitudinally conduplicate; rudimentary pistil conical or sometimes (*T. sagittata*) depressed, gland-like. *Female flowers*: receptacle, calyx and corolla as in the male; staminodes 3, setiform or linear and elongated, rarely (in *T. sagittata*) short, thick and fleshy; ovary ovoid to oblong in outline, often separated from the receptacle by a marked constriction; placentas 3; ovules horizontal usually numerous; style columnar usually rather long, but occasionally shorter than the stigma, stigma either 3-lobed and dilated or of two large flat lobes each usually bilobed, so that the stigma appears to be 4-lobed. *Fruit* ovoid, subglobose or oblong, often pointed, fleshy, red when ripe, usually small, few-seeded. *Seeds* white, ellipsoid to subglobose, usually thick, rarely compressed; testa crustaceous, smooth; tegmen membranous; cotyledons elliptic, flattened or thick and fleshy, radicle evident or small, conical and blunt.

Found in Africa south of the Sahara to South West Africa and the eastern Cape Province and in Madagascar.

The morphology of the flowers of *T. sagittata* is slightly different from those of the majority of the species, so that the generic description as given by Bentham and Hooker, Cogniaux and Phillips has to be slightly amended. As will be pointed out in the discussion of the aberrant species concerned, it certainly belongs in *Trochomeria*.

Although *Trochomeria* is reported to be sometimes monoecious, the normal condition appears to be dioecious. Monoecious specimens (if they occur at all) must be freaks as also occur in other normally dioecious species (*Melothria* spp. *Kedrostis* spp. and *Lagenaria marsecena*).

Harms (in Cogniaux et Harms, Pflanzenreich 1924, p. 185) already pointed out that the leaves in many species are extremely variable so that it is difficult to name a species with certainty ("wodurch die sichere Bestimmung oft erschwert wird"). This is quite true, but one should go one step further and reduce several species still distinguished in the 1924 monograph to synonymy. Apart from the variation in leaf-shape, the constancy and hence the diagnostic value of the following characters has been grossly over-estimated:

(a) the absence or presence of a stipuliform bract-like organ at the base of the petiole;

(b) the relative length of the male peduncle (in relation to the length of the petiole or the leaf);

(c) the presence of the solitary or fascicled male flowers as against a racemose sometimes several-flowered inflorescence;

(d) the relative lengths of receptacle and petals.

(Ad a). There are no doubt some species in which the stipuliform leafy organ is almost always developed (as in the type species) and some in which it is persistently lacking (as in the subgenus *Heterosicyos* and in *T. sagittata*), but Cogniaux already realised in 1881 that *T. macrocarpa* occurs in two forms, one without "bracts" and one in which they are developed ("var. *bracteata*" Cogn.). The same phenomenon occurs in several forms of *T. debilis* which received different specific names (*T. wyleyana*, *T. vitifolia*, *T. baumiana*). Specimens showing some leaves with and some without "bracts" or leaves with some small "bracts" are frequently encountered.

(Ad b & d). The lengths of the organs concerned vary to such an extent that the relative lengths, if not strikingly different, have no diagnostic value at all.

(Ad c). The male flowers sometimes occur solitary, in fascicles or in racemes on one specimen and the arrangement has, therefore no diagnostic value.

It is therefore not surprising that a drastic reduction in the number of species is indicated. The 1924 Pflanzenreich Monograph mentions 19 species and Phillips in 1951 has recorded a total of 26 described species. A preliminary (and necessarily superficial) analysis of all described species suggests that only about a dozen species should be retained.

Of the 10 species previously recorded from South Africa (i.e., 7 in the 1924 Monograph and an additional 3 described by Burt Davy in 1926), for instance, only 4 are recognised in the present paper, 5 of them are reduced to synonyms and one is excluded from the genus altogether.

The flowers are not infrequently precocious (i.e., they appear before the leaves) although this can vary within one species. Precocious flowers are, for instance, not rare in *T. debilis*, *T. macrocarpa*, and *T. brachypetala* R. E. Fries. One of the species reduced to a synonym of *T. macrocarpa*, *T. nudiflora* Burt Davy, is based on such a precociously flowering specimen.

- Male flowers with a short funnel-shaped to widely campanulate receptacle not much longer than wide, 3-4 mm long; petals 4-5 mm long; style shorter than the stigma; leaves sagittate, entire; a diminutive plant..... 1. *T. sagittata*
 Male flowers with a subcylindric elongate receptacle, distinctly longer to several times longer than wide; receptacle and petals usually much more than 4 mm long; style much longer than the stigma; leaves variously but usually not sagittate:
 Petals very acute, long-acuminate or long-tapering, usually well over 20 mm long 2. *T. macrocarpa*
 Petals acute or subacute but as a rule not long-acuminate or tapering into a narrow acute point, usually well under 16 mm long:
 Leaves variously dissected, but usually very deeply so, the lobes under 1 cm wide; both surfaces scabrid to puberulous or glabrous, rarely pilose..... 3. *T. debilis*
 Leaves palmately lobed to about the middle, rarely nearly to the base; the lobes usually over 1 cm wide (often much wider); both surfaces usually shortly and rather sparsely pilose-hirsute..... 4. *T. hookeri*

1. ***T. sagittata*** (*Harv. ex Sond.*) *Cogn.*, Mon. Cucurb. 400 (1881); Pflanzenreich 275.2: 192 (1924); Burt Davy, Fl. Transv. 1: 225 (1926).
Lagenaria sagittata Harv. ex Sond. in Fl. Cap. 2: 489 (1862); Harv., Thes. Cap. 2: t. 183 (1863).

Type: *Sanderson* from Durban (Port Natal) in Herb. Hooker (K), also in TCD; the Kew specimen proposed here as the actual holotype.

Tuber subglobose, attaining the size of an apple, covered with a brownish bark. *Stems* several from the base, prostrate, occasionally climbing, almost invariably unbranched, slender to filiform, striate, glabrous, rarely over 50 cm long. *Leaves* rather rigidly herbaceous, 4-7 cm long and 1-4 cm wide at the base, only in exceptional cases reaching 13 × 8 cm (with the basal lobes 6-8 cm long), varying from triangular with a subsagittate base to narrowly sagittate with long basal lobes, or occasionally 5-lobed with two longitudinal parallel basal lobes and two perpendicularly sideways spreading lateral lobes; margin entire, finely scabrid-setulose, the lobes acute, scabrid to glabrous or shortly setulose-hairy; petioles slender to filiform, usually glabrous, 1-2 cm long, ebracteate. *Tendrils* filiform, glabrous or nearly so. *Male flowers* usually fasciculate, 1-3, rarely more, per axil, occasionally in a few-flowered subumbellate raceme; peduncles nodding, capillary, usually shortly hairy, 1-4 cm long; pedicels of racemose flowers short; receptacle funnel-shaped to narrowly campanulate, 3-5 mm long and 3-4 mm wide at the throat, usually with a few short appressed stiff hairs; sepals ovate-triangular, up to about 0.5 mm long; petals white to cream or greenish-white, somewhat fleshy, triangular-ovate, obtuse to subacute, 4-6 mm long, densely and finely papillose; filaments short, connective broadened and papillose at the apex; rudiment of ovary represented by a depressed gland-like structure at the base of the receptacle. *Female flowers* solitary; pedicels and perianth as in the male; staminodes 3,

short, thick and fleshy, oblong or somewhat obconical; ovary narrowly ovoid or fusiform-oblong, glabrous and smooth, narrowly apiculate; disc none; style shorter than the laterally flattened, sub-bilobed and more or less flabelliform stigma. *Fruit* on a peduncle up to 4 cm long, ovoid, acute or shortly acuminate, glabrous, faintly marked with a few fine longitudinal ridges, 16–21 mm long and 11–14 mm in diam. *Seeds* in the fruits examined 3–4, subglobose-ellipsoid, smooth, 5–6 mm long, 4–5 mm wide and nearly 4 mm thick.

TRANSVAAL.—Barberton: Duivelskantoer, *Bolus* 7772 (BOL).

NATAL.—Mahlabatini: *Gerstner* 4189 (NH). Eshowe: near Eshowe, *Lawn* 1140 (NH); *Gerstner* 4086 (NH, leaves exceptionally large, 12–13 cm long, 6–8 cm wide at the base, basal lobes 4–6 cm long). Kranskop: near Kranskop, *Acocks* 11620 (PRE, NH). Weenen: Muden, *Wylie* Hb. no. 28006 (NH, PRE). Umvoti: Greytown, *Meebold* 13153 (M). Lion's River: Karkloof, *Wylie* Hb. no. 10904 (NH). New Hanover: Krantzklouf, *Schlechter* 3197 (BOL, GRA, PRE, also in SAM, where the number given is 3195, but is probably a mistake for 3197); near Appelbos, *Acocks* 11828 (NH). Pietermaritzburg: Hawthorn's Hill, *Allsopp* 890 (NH). Camperdown: Botha's Hill, *Wood* Hb. no. 1378 (NH). Inanda: *Wood* 285 (NH, SAM); 7527 (M). Durban: near Durban, *Sanderson* 707 (GRA, isotype!); *Mogg* 11020 (PRE). Ixopo: near Ixopo, *Maxwell Evans* 284 (NH). Umzinto: Ifafa, *Handley* 57 (NU); Dumisa, Campbellton, *Rudatis* 1711 (PRE).

CAPE.—Umzimkulu: Clydesdale, *Tyson* 2145 (BOL, SAM). Mount Currie: about 17 miles E. of Kokstad, *Killick & Marais* 2022 (PRE), *Marais* 943 (PRE); Kokstad, *Tyson* 1827 (BOL). Ngqeleni: Encokos, between Umtata and Port St. Johns, *Flanagan* 2496 (PRE). Mqanduli: near Mqanduli, *Pegler* 562 (PRE).

This species differs in some respects from the type species. The flowers are small and the various floral parts relatively shorter than in typical *Trochomeria* flowers, but these differences are all relative and *T. sagittata* has all essential characters of the genus such as dioecious flowers, the absence of a disc and the presence of staminodes in female flowers, the papillose connective and the rudiment of an ovary in the male flowers, the few-seeded pulpy fruits with tumid emarginate seeds and tuberous roots. Although it does not resemble the other members of the subgenus *Trochomeria* (= *Eutrochomeria* Cogn.) very much in habit (at a first glance one would sooner take it for a species of *Melothria* or *Kedrostis*), there is no reason to exclude this species from *Trochomeria*. A slight emendation of the generic characters mainly pertaining to relative sizes and shapes of the floral parts is all that is necessary.

As a rule *T. sagittata* grows among grass and this may be the reason why this small plant is not so well represented in herbaria through being easily overlooked.

2. ***T. macrocarpa*** (Sond.) Hook. f. in Fl. Trop. Afr. 2: 524 (1871); Cogn., Mon. Cucurb. 398 (1881); Pflanzenreich 275.2: 188 (1924); Burt Davy Fl. Transv. 1: 225 (1926); Meeuse in Flow. Pl. Afr. 30: t. 1168 (1954). *Zehneria macrocarpa* Sond. in Fl. Cap. 2: 488 (1862). Syntypes: Transvaal, Potchefstroom, Mooi River, *Burke* 290, *Zeyher* 579 (S, K). *Trochomeria nudiflora* Burt Davy, op. cit. 57, 225 (1926). Type: *Junod* 652 (K, holo.!) from Letaba distr., Transvaal.

Tuber napiform, up to 60 cm long and 25 cm in diam. *Stems* annual, prostrate or climbing, more or less pilose, usually sparsely so, up to 1.5 m long. *Leaves* suborbicular in outline, palmately digitate or deeply 5–7-lobed, up to 6 cm long and broad, the lobes (ob) lanceolate to oblong, acuminate, mucronate, entire or somewhat pinnatisect, sparingly shortly hirsute and scabrid on both sides; petioles up to 25 mm long, sparsely shortly hirsute. *Stipuliform bract* suborbicular, pectinate-incised, up to 15 × 15 mm. *Male flowers* frequently appearing before the leaves, solitary, fascicled or occasionally shortly racemose (racemes up to 8-flowered); pedicels and common

peduncles up to 5 cm long; bracteoles early deciduous; receptacle tubular to faintly obconical 18–22 mm long, thinly pubescent; sepals triangular-subulate, 1–2 mm long; petals greenish yellow (“citrine”) often tinged with red, spreading with reflexed tips, linear-subulate from 2–2.5 mm broad base, 18–24 mm long. *Female plant*: flowers solitary, pedicels up to 2.5 cm long, ovary 6–8 mm long, separated by a constriction from the 10–15 mm long receptacle; calyx and corolla as in the male flower; fruit ellipsoid-oblong, bright red when ripe, 3–4 cm long and 2–3 cm in diam.; seed 8–10 mm long, 5–6 mm broad, 4–5 mm thick.

Recorded from tropical Africa, Angola, Bechuanaland Protectorate, Southern Rhodesia, Portuguese East Africa and from the following districts.—*South West Africa*: Windhoek, Karibib, Okahandja, Outjo, Grootfontein, Okomitundu, Okavango, Ovamboland, Kaokoveld; *Transvaal*: Pietersburg, Potgietersrust, Warmbaths, Rustenburg, Bloemhof, Ventersdorp, Potchefstroom, Brits, Pretoria, Johannesburg, Heidelberg, Groblersdal, Nelspruit, Barberton; *Swaziland*; *Natal*: Greytown.

This plant is also rather variable, hence the varieties distinguished by Cogniaux in his 1924 monograph, but they are not clear cut and should not be maintained. *T. nudiflora* Burt Davy is nothing but an early flowering stage, as the flowers often appear before the leaves.

3. *T. debilis* (Sond.) Hook. f. in Fl. Trop. Afr. 2: 525 (1871); Cogn., Mon. Cucurb. 399 (1881); Pflanzenreich 275.2: 189 (1924); Burt Davy, Fl. Transv. 1: 225 (1926). *Zehneria debilis* Sond. in Fl. Cap. 2: 488 (1862). Syntypes: *Burke* 141 and *Zeyher* 577 (K, S). *Z. pectinata* Sond., op. cit. 487 (1862). Type: Namaqualand, Buffels River, *Drege* s.n. (S, lecto.!, PRE, photo.). *Z. wyleyana* Sond., op. cit. 489 (1862). Type: Namaqualand, *Wyley* s.n. (S, holo.!, TCD, iso.). *Trochomeria pectinata* (Sond.) Cogn., op. cit. 397 (1881); 187 (1924), excl. var. *subintegrifolia* Cogn. in Bull. Herb. Boiss. 3: 418 (1895); Burt Davy, op. cit. 224 (1926). *T. wyleyana* (Sond.) Cogn., op. cit. 396 (1881); 187 (1924).

Stems prostrate or climbing up on grasses or bushes, longitudinally sulcate, glabrous or somewhat hairy, up to about 1 m long, occasionally longer when prostrate, often much longer when climbing. *Leaves*: blade 1.3–6 cm by 1.8–11 cm, very variable in shape and size but usually of 5–7-, rarely 3- or 9-, nearly free, linear or subfiliform to broadly (ob) lanceolate, entire or coarsely pinnatifid, acute, acuminate to subaristate or obtuse, lobes which are 2–5 cm, occasionally up to 8 cm long, and usually under 1 cm broad, usually more or less lepidote-scabrid with minute broad-based stiff sub-aculeate hairs especially on lower surface and along the margins; petioles always much shorter than the blades, usually under 2 cm long; stipuliform bract absent or suborbicular to flabellate, coarsely and more or less bluntly toothed or with very acute lobes with sometimes a subulate point, sometimes deeply and irregularly dissected, 0–1 cm long and broad but occasionally larger. *Male Plant*: pedicels solitary or fascicled, slender, under 2 cm long; receptacle narrowly obconical, 1–2 cm long; sepals subulate 1–2 mm long; petals greenish-yellow to olive, triangular to elongate-triangular, acute to more or less attenuate at the apex, usually 5–12 mm long. *Female Plant*: ovary subglobose to ellipsoid 6–17 mm long; calyx and corolla as in the male. *Fruit* ovoid-oblong to ellipsoid, usually more or less narrowed into the somewhat pointed apex, bright red when ripe, 2.5–3.5 cm long and 2–2.5 in diam. *Seeds* few, white, more or less 8 mm long and more or less 5 mm broad.

Recorded from Angola and Bechuanaland and also the following.—*Cape Province*: Namaqualand, Prieska, Hay, Barkly West, Kimberley, Herbert, Phillipstown, Murraysburg, Fort Beaufort; *Transvaal*: Barberton, Nelspruit, Middelburg, Bronkhorstspuit, Warmbaths, Rustenburg, Waterberg, Potgietersrust; *South West Africa*: Warmbad, Keetmanshoop, Windhoek, Gobabis.

This variable plant has been described under several names because of the variation in the degree of development and the dentition of the stipuliform bracts, the differences in leafshape and in some other characters, none of which are constant.

Zehneria pectinata was described as monoecious, but the lectotype specimen (selected by me) in the Sonder herbarium does not show any female features and I am of the opinion that some mistake was made. This lectotype is undoubtedly the same as *T. debilis*. The other specimen cited by Sonder (*Owen* s.n. from Durban*) I have not seen, but it must belong to a different species, because *T. debilis* does not occur in Natal. Additional citations under "*T. pectinata*" by Cogniaux in his monographs refer to specimens from areas where *T. debilis* has never been collected. For this reason I prefer to regard *Zehneria pectinata* as a somewhat confused entity and although it has page priority over *Z. debilis* take up the latter name for the complex. *T. pectinata* var. *integrifolia* is a perfectly typical specimen of *T. hookeri* (q.v.)

4. *T. hookeri* Harv., Gen. S. Afr. Pl., ed. 2: 125 (1868); Cogn., Mon. Cucurb. 397 (1881); Pflanzenreich 275.2: 188 (1924); Burt Davy, Fl. Transv. 1: 224 (1926). *Pilogyne garcini* Harv., Thes. Cap. 1: 60 t. 96 (1859), non (L.) Arn. *Zehneria garcini* Sond. in Fl. Cap. 2: 487 (1862), excl. syn., non (L.) Stocks. *Z. pectinata* Sond., op. cit. 487 (1862), ex parte. *Trochomeria pectinata* (Sond.) Cogn., op. cit. 397 (1881); 187 (1924); Burt Davy, l.c., ex parte. *T. pectinata* var. *subintegrifolia* Cogn. in Bull. Herb. Boiss. 3: 418 (1895); Pflanzenreich 275.2: 188 (1924). *T. subintegrifolia* (Cogn.) Burt Davy, l.c. *T. rotundata* Burt Davy, op. cit., 52, 221. Type: Galpin 1181 from Barberton (K, holo.; PRE, iso!).

Type: Harvey's original description and plate in Thes. Cap. 1: 60 t. 96 though published under the wrong name, were based on a *Sanderson* specimen (in TCD) and when he later corrected himself he did not cite any other specimens, so that this Sanderson specimen has to be taken as the holotype. Isotypes are present in Herb. Sonder (according to Fl. Cap.) and K.

Stems longitudinally sulcate, shortly hispid when young, glabrescent, up to 2 m long. Leaves herbaceous, broadly triangular-cordate or suborbicular-cordate to broadly cordate or pentagonal, usually with a wide and shallow basal sinus, more or less thinly and shortly hispid-setose, 4-9 cm long and 5-9 cm wide, palmatilobed with usually 5, rarely 3 lobes, usually incised to about the middle with broad ovate or obovate to obtusely lobes, occasionally (in the form described as *T. rotundata* Burt Davy) more deeply so with oblong or lanceolate lobes, rarely nearly undivided, 5-angled; lobes usually obtuse or rounded, often distinctly mucronate to apiculate, distinctly dentate to coarsely pinnatilobed; petioles rather firm, shortly hairy, 2-3.5 cm long, almost invariably with a large suborbicular-cordate, long dentate-ciliate stipuliform bract up to 2.5 × 2.5 cm at the base. Male flowers: pedicels solitary or fascicled or occasionally racemose on a very short common peduncle, filiform, hairy, 1-2 (-4) cm long; receptacle subcylindric, usually distinctly rounded to subtruncate at the base, slightly widening upwards, 10-16 mm long and about 3 mm in diam., sepals reflexed, triangular-subulate, distant, about 2 mm long; petals patent to somewhat reflexed, triangular-oblong or triangular-lanceolate, acute and usually recurved at the apex, 6-10 (-15) mm long, 2-3 mm wide at the base. Female flowers: peduncle slender, up to 2 cm long, incrassate in fruit; ovary broadly ovoid to subglobose, rostrate glabrous or puberulous; perianth as in the male but receptacle and petals slightly wider. Fruit broadly ellipsoid or ovoid, 2-3 cm long and in diam., red when ripe. Seeds 10-12 × 5 × 3 mm.

* It is, however, known that Miss Owen collected also in the Transvaal and these gatherings are frequently assigned to Natal.

TRANSVAAL.—Soutpansberg: Louis Trichardt, *Breyer* Hb. no. 24189 (PRE). Sibasa: *Junod* s.n. (PRE). Pietersburg or Letaba: Magoebaskloof, *Gerstner* 5816; 5817 (PRE). Pietersburg: Houtbosch, *Rehmann* 6304 (BR); 6309 (type of *T. pectinata* var. *subintegrifolia* = *T. subintegrifolia*, BR). Letaba: Shilovane, *Junod* 1351 (Z); The Downs, *Junod* 4243 (PRE). Pilgrims Rest: Mariepskop, *Fitzsimons & van Dam* Hb. no. 26255 (PRE); Pilgrims Rest, *Rogers* 18256 (PRE). Middelburg: Tautesberg, *Young* A224 (PRE). Belfast: Machadodorp, *Bruce* 471 (PRE); Schoemanskloof, *Young* A360 (PRE). Carolina: Waterval Onder, *R. Guy* in Herb. Moss 14977 (J); Carolina *Radermacher* Hb. no. 7474 (PRE). Nelspruit: White River, *Rogers* 23556 (J); Nelspruit, *Liebenberg* 2536 (PRE). Barberton: *Pott* 5449 (PRE); *Thorncroft* 53868 (NH); Umvoti Creek, *Galpin* 837; Queens River, *Galpin* 1181. Ermelo: Mavrieriëstad, *Pott* 4890 (PRE).

NATAL —“Zululand”: *Haygarth* in Herb. Wood 11018 (NH) Nongoma: near Nongoma: *Gerstner* 4693 (PRE). Hlabisa: near Hlabisa, *Gerstner* 1994 (NH); Hluhluwe Game Reserve, *Ward* 1906 (NH, PRE). Entonjaneni: near Biyela Store, *Codd* 1899 (PRE). Eshowe: Nkwaleni, *Acocks* 12955 (PRE). Mtunzini: *Woop* 11087 (NH, NU); 11387 (BOL, NU, PRE). Mapumulo: Nonoti, *Wood* 11391 (SAM). Verulam: Umhlanga, *Wood* Hb. no. 8879 (NH). Camperdown: *Franks* in Hb. Wood 11800 (NH). Umzinto: Umpambinyoni, *Rudatis* 1980 (NH). Alfred: Harding, *Oliver* Hb. no. 18431 (NH). District unknown: Oakfird, *Wood* 978 (SAM). Natal, without exact locality: *Mrs. Saunders* Hb. no. 2311 (NH).

CAPE PROVINCE.—Prob. Qumbu distr.: Tina River, *Schlechter* 6396 (COI, GRA, PRE). Mqanduli: *Pegler* 585 (PRE). Kentani: *Pegler* 1197 (BOL). Komgha: *Flanagan* 96 (BOL, PRE, SAM). King William's Town: Buffalo River Valley, *Galpin* 5915 (GRA, PRE).

Some specimens referred to *T. pectinata* by Cogniaux, viz., those from Natal and Moçambique, and certainly those referred to the var. *subintegrifolia* [= *T. subintegrifolia* (Cogn.) Burt Davy] are referable to *T. hookeri*. See also the notes under *T. debilis* relating to *T. pectinata*.

EXCLUDED SPECIES

T. rehmannii Cogn. in *Pflanzenreich* 275.2: 194 (1924). The type specimen, *Rehmann* 3247 (Z, holo.!) is poor, but it is probably a young plant of *Lagenaria siceraria*, at any rate it is not a *Trochomeria*. The area where the *Rehmann* specimen was collected “Hogevelde, Rietpoort” is most probably in the Standerton or Volksrust district, an area very poor in Cucurbitaceae (except cultivated species) and the chance of finding an undescribed cucurbitaceous plant in that area was remote. The only species that might occur in that area is *Peponium caledonicum* and it might be a seedling of this species if it is not a *Lagenaria*. In either case the name can be disregarded.

15. PEPONIUM

Peponium Engl. in Engl. & Prantl, *Pflanzenfam. Nachtr.* 318 (1897); 2: 75 (1900); Cogn., in *Pflanzenreich* 275.2: 212 (1924); Phillips, *Gen. ed.* 2: 750 (1951). *Peponia* Naud. in *Ann. Sci. Nat.*, 5me. sér. 5: 29 (1867); Benth. & Hook. f., *Gen. Pl.* 1: 823 (1867); Cogn., *Mon. Cucurb.* 405 (1881); Baill., *Hist. Pl.* 8: 444 (1886); Pax in *Pflanzenfam.* 4, 5: 31 (1889); non Grev. (1863). *Peponiella* Kuntze, *Rev. Gen.* 3: 131 (1898).

Type species: *Peponia mackenii* Naud. = *Peponium mackenii* (Naud.) Engl.

Perennial stout herbaceous climbers or creepers with fibrous or somewhat tuberous roots. *Main stems* perennial or annual. *Leaves* rather large, petiolate, usually palmatilobed or -sect, rarely entire, dentate; petiole without glands at the apex. *Tendrils* usually unequally bifid, rarely 3-5-fid or undivided. *Flowers* rather large, white to yellow, monoecious*; the male ones racemose and usually bracteolate, or solitary, the female ones always solitary. *Male flowers*: receptacle subcylindric or narrowly campanulate to narrowly obconical, attenuate but sometimes with a small subglobose swelling at the base; sepals 5, usually erect to patent, subulate to lanceolate; petals 5, free, usually patent, obovate, entire, often shortly pubescent or papillose-puberulous; stamens 3, inserted in the tube of the receptacle, filaments free, anthers included, cohering into an oblong to subcylindric capitulum, one 1-theous and two 2-theous, the locules lengthwise triplicate; connective narrow, not produced at the apex; rudiment of pistil gland-like or not evident. *Female flowers*: calyx and corolla as in the male; staminodes 0, very rarely 3, linear; ovary oblong to fusiform, usually long-attenuate at the apex, triplacentiferous; style columnar, stigma tripartite; ovules numerous, horizontal. *Fruit* narrowly ovoid or ellipsoid to subcylindric-fusiform, fleshy with a firmer outer layer and a soft pulp containing the seeds. *Seeds* numerous, obovate in outline, much compressed, dark, distinctly margined; testa crustaceous, smooth.

An African genus of 21 described species (one of which occurs in Madagascar), with the main centre in east tropical Africa.

It is clear from a study of only a few species of this genus that probably too many species were maintained by Cogniaux in his 1924 monograph. His main key character "*Flores masculi solitarii*" as against "*Flores masculi racemosi*" breaks down. In at least two of the species of Cogniaux's group with supposedly solitary male flowers occasional specimens with racemose flowers occur (*P. vogelii* from West Africa and *P. mackenii* from Natal) and in Cogniaux's group with racemose male flowers, specimens with solitary male flowers are sometimes found (as in the South African *P. caledonicum*). The value of other key characters used by Cogniaux, such as the degree of pubescence of the vegetative parts and the receptacle and the degree of lobing of the leaves seems at least doubtful. A revision of the genus as a whole appears to me highly desirable (an opinion shared by Mr. Killick after a cursory examination of the Kew material) and would certainly lead to a reduction of the species recognised by Cogniaux by about a third but, to undertake this, a study of all the African material is necessary and this is beyond the scope of the present revision. There are in South Africa two species which are clearly identifiable and which were described so long ago that their names will probably stand, but additional synonyms among species described from tropical Africa can be expected. There is, for instance, a strong relationship between *P. mackenii* and the tropical *P. usambarensis* (Engl.) Engl.

However, there are in South Africa a few specimens which cannot be quite satisfactorily named. They are undoubtedly related to some of the species from tropical Africa. Because of the paucity of the material and the urgent need of a revision of the whole genus these few gatherings will not be described as new or definitely assigned to a species recorded from tropical Africa; only their affinities will be indicated.

Male flowers usually solitary on long pedicels; lobes of leaves not constricted at the base; pubescence of stems, petioles and sepals usually of long, more or less crinkly and articulate hairs..... 1. *P. mackenii*
 Male flowers usually racemose on short individual pedicels (sometimes a long-pedicelled male flower at the base of the raceme in same axil); lobes of leaves usually constricted at the base:

* Cogniaux (1881, 1924) states: "*Flores monoici vel dioici*". However, there is no proof of a truly dioecious species in this genus (I have never seen one nor a description of a dioecious species) and I expect that all species are monoecious.

Common peduncle (below lowermost male flower) under 12 cm long; pubescence on stems usually of short hairs, sometimes on young parts forming a short tomentum 2. *P. caledonicum*
 Common peduncle (below lowermost male flower) over 12 cm long:
 Plant glabrous or glabrescent..... 3. *P. sp. cf. P. chirindense*
 Plant persistently more or less hairy..... 4. *P. sp. cf. kilimandscharicum*

1. *P. mackenii* (Naud.) Engl. in Pflanzenfam., Nachtr. 318 (1897); Cogn. in Pflanzenreich 215 (1924).

Peponia mackenii Naud., tom. cit. 29, t. 3, 4 (1867). Type: cultivated specimens from Algeria (P, holo., PRE, photo.!, K, iso., PRE, photo.!), see below.

Stems normally climbing, occasionally prostrate, rather stout, longitudinally sulcate, up to at least 10 m long, at least in the young parts rather densely covered with multicellular soft curved or crinkly hairs of a drab or pale fawnish colour, less often pubescence nearly absent. *Leaves* herbaceous drying thin but not quite membranous, more or less pentagonal in outline, 6–13 cm long, 6–16 cm broad, palmatilobed to about the middle or less deeply so with the upper three lobes large, distinct, triangular in outline, gradually acute or acuminate to cuspidate, the central one slightly larger; two lowermost lobes often much smaller and oblique or somewhat irregular, sometimes bilobed; basal sinus usually broad and often rather shallow; upper leaf surface thinly covered with appressed long or short hairs, glabrescent or becoming smooth, or scabrid from the sometimes persistent bases of the hairs appearing as minute whitish pustules; lower surface more densely and more persistently pubescent mainly on the larger veins; leaf margin rather finely crenate-dentate with usually acute to apiculate-mucronate teeth; petioles usually densely pilose, rather stout, 3–8 cm long. *Male flowers* usually solitary and in this case on 4–18 cm long pubescent pedicels or rarely in few-flowered racemes on a common peduncle up to about 8 cm long on short usually pubescent bracteolate pedicels; bracteoles obovate, membranous, sometimes stipitate, about 1 cm long; receptacle obconical to narrowly campanulate, much attenuate towards the base but a small basal portion again dilated, nearly glabrous, 16–18 mm long and 8–9 mm in diam. at the apex; sepals erect, usually thinly pilose, 5–6 mm long; petals light clear yellow, papillose, 3–3.5 cm long. *Female flowers*: pedicels 1–2 cm long; ovary narrowly fusiform, somewhat pilose. *Fruit* ovoid-oblong, somewhat narrowed but rounded at the base, conical-attenuate at the apex, green mottled with white when young, ultimately glabrous, smooth, red, 6–9 cm long and 3–4 cm in diam. *Seeds* dark-brown to dull black, 9–10 mm long, 5–6 mm broad and 1–2 mm thick.

Type: The original material consisted of cultivated specimens grown in Algeria and sent to Naudin in Paris; authentic material sent to Hooker by Naudin (in K, photos in PRE) was compared by Mr. Killick with a sheet received from Paris as the type and judged identical, probably even from the same plant. The seeds were originally received from Macken who collected them somewhere in Natal.

NATAL.—Ngotshe: Ngome Forest, *Gerstner* 4474; 4506; 4832 (PRE). Nkandhla: *Wood* 11426 (NH); *Pole Evans* 4719 (PRE). Eshowe: Lawn 1860 (NH). Durban: near Durban, *Wood* 7913; s.n. (L); Durban Bluff, *Marriott* Hb. no. 24330; 24331 (NH); Stella Bush, *Marriott* Hb. no. 36821 (NH); Berea, *Wood* s.n. (J); Berea Bush, *Wood* 4546 (NH, PRE); 5255 (NBG); 11181 (NH, NU, PRE).

CAPE PROVINCE.—Port St. Johns: *Galpin* 3434 (PRE); *Mogg* 13111 (PRE); *Pahl* Hb. no. 25382 (BOL). Komgha: *Flanagan* 1733 (PRE, NBG).

This plant seems to be a forest margin or light forest dweller in the lowland forest areas in frost-free regions.

Although it has not to my knowledge been recorded outside the area indicated above, this species has so many features in common with *P. usambarensis* from East Africa, that the latter may prove to be at best only a variety of *P. mackenii*. I find it extremely difficult to separate specimens of *P. mackenii* with racemose male flowers

from specimens in PRE received under the name *P. usambarense*. The differences that I find are in the size of the leaves (they are larger in the East African form), the length of the male peduncle (longer in *P. usambarense*) and perhaps in the flowers (larger in the tropical form), but these do not seem to carry much weight.

2. *P. caledonicum* (Sond.) Engl., l.c. (1897); Cogn., op. cit. 218 (1924). *Luffa caledonica* Sond. in Fl. Cap. 2: 490 (1862). Type: *Burke* 305 (K, holo.; PRE, photo.!; NBG-SAM, iso.!), see below. *Peponia caledonica* (Sond.) Cogn., Mon. Cucurb. 410 (1881); Burt Davy Fl. Transv. 1: 230 (1926).

Stems prostrate, stout, sulcate, usually more or less pubescent with usually short hairs, glabrescent, up to at least 5 m long. *Leaves* firmly herbaceous drying somewhat pergamaceous or papyraceous, in outline cordate-orbicular, usually with a broadly rounded shallow basal sinus and decurrent in the middle on the petiole, 5-partite to about or somewhat beyond the middle, when mature glabrous above or nearly so, occasionally somewhat scabrid, finely pubescent beneath but glabrescent and pubescence ultimately only persistent on main veins, 6–12 cm long and broad; lobes usually distinctly contracted at the base and approximate to somewhat overlapping, oblong or obovate to suborbicular, usually rounded or obtuse, rarely (and in this case often only the central one) acuminate or apiculate; basal ones and rarely the lateral ones with additional lobule; the margin rather coarsely crenate-dentate with usually acute and callosomucronate teeth; petioles densely and shortly hairy, glabrescent, 2–3 cm long. *Male flowers* racemose, rarely solitary; common peduncle densely pubescent, up to 12 cm long, whole raceme up to 25 cm long and up to about 12-flowered; pedicels of racemose flowers usually erect, pubescent, articulated at the apex, up to 2 cm long, those of solitary flowers (sometimes also found at the base of a raceme in same axil) up to 10 cm long; bracteoles ovate or oblong, usually dentate, herbaceous, hairy, 3–7 mm long, often stipitate; receptacle obconical, pubescent, 16–18 mm long, 6–8 mm wide at the apex, sepals erect, subulate, 7–8 mm long; petals 24–30 mm long, puberulous. *Female flowers* subsessile; ovary fusiform, densely and shortly hairy. *Fruit* on a very stout pedicel under 1 cm long, oblong-fusiform or subcylindric with conical-acuminate apex, green when immature, glabrous, smooth and red when ripe, 7–10 cm long and 2–3.5 cm in diam. *Seeds* black, 7–8 mm long, 4–5 mm broad and 1–1.5 mm thick.

Type: Burt Davy (l.c.) cites *Burke* 305 and *Zeyher* 589 as syntypes, and they are indeed the only two specimens cited by Sonder. The specimen *Burke* 305 in Herb. Hooker (K; photo. in PRE) is selected here as the lectotype (iso.! in SAM nunc NBG). TRANSVAAL.—Rustenburg: Bospoort Dam, *Codd* 6363 (PRE); *Turner* s.n. (PRE). Potchefstroom: *v.d. Westhuizen* 890; *Louw* 1430 (PRE); Venterskroon, *van Dam* in TRV no. 16934 (PRE). Krugersdorp: Krugersdorp, *Jenkins* in TRV no. 10106 (PRE); Muldersdrift, *Webster* 1 (PRE); Witpoortjiekloof, *Moss* 5040 bis (J). Brits: Castle Gorge, *Meeuse* 9260 (PRE, SRGH). Johannesburg: Johannesburg, *Gilfillan* 102 in Herb. *Galpin* no. 6114 (GRA, PRE); *Moss* 9645; 9778; 16544 (J); *Gerstner* 6528 (PRE). Vereeniging: Klipriviersberg, *Mogg* Hb. no. 21566 (PRE, J); Vereeniging: *Mogg* 21006 (J); *Phillips* s.n. (PRE). Bronkhorstspruit: 11 miles N.E. of Bronkhorstspruit, *Codd* 2697 (PRE). Lydenburg: Lulu Mts., farm Hoogstepunt, *Barnard* 495 (PRE). Belfast: 8 miles from Belfast on Stofberg Road, *Story* 6521 (PRE). CAPE PROVINCE.—Hay: Asbestos Mts., *Marloth* 2065 (PRE); Bergenaars Pad, *Acocks* 2447 (BOL, KMG, PRE); Paardekloof, *Cooke* Hb. no. 6653 (KMG). Kimberley: Spytfontein, *Marloth* 762 (PRE). Queenstown: near Queenstown, *Galpin* 2557 (BOL, PRE); 8285 (BOL, GRA, PRE). ORANGE FREE STATE.—Bloemfontein: *Mostert* 842 (PRE). Rouxville: Wolwekop, *Burke* 305 (K, lecto.; PRE, photo.!; NBG, iso.!).

In addition, according to Cogniaux (1924) and to Burt Davy in Kew Bull. 196 (1921), recorded from Bethlehem and Winburg in the Orange Free State, from Basutoland and from Cradock and Graaff-Reinet in the Cape Province.

P. caledonicum is usually found in rather exposed open grassy slopes of rocky ravines or on rocky outcrops in places with rather low winter temperatures and can apparently stand fairly severe frosts. The specific epithet refers to the Caledon River, a tributary of the Orange, because Burke and Zeyher collected the plant at Wolwekop which is not far from the river; it does not refer to the Caledon District of the Cape Province or any other "Caledon" or anything related to Scotland, and this is likely to be somewhat confusing.

3. **P. sp. cf. *P. chirindense*** (*Bak. f.*) *Cogn.* in Pflanzenreich 218 (1924).

There is one gathering of a *Peponium* (Transvaal, Soutpansberg: Wylliespoort, Smuts 2075 in PRE) which is almost completely glabrous in all its vegetative parts and has glabrous peduncles. The leaves are larger and thinner in texture than those of *P. caledonicum* and the male peduncle much longer (about 20 cm below the flowers). This specimen agrees reasonably well with the description of *P. chirindense* (except in such details as larger leaves which are also 5-fid rather than 3-fid, less undulate leaf-margin) and with specimens from the type locality of the latter (*Obermeyer* 2186 from Chirinda forest, Mt. Selinda, S. Rhodesia). It is for the time being tentatively referred to this species.

4. **P. sp. cf. *P. kilimandscharicum*** (*Cogn.*) *Engl.*; for synonymy and description, vide Cogniaux, 219 (1924).

There are three gatherings from the Transvaal which are tentatively referred here: *Gerstner* 5902 (PRE) from Soutpansberg, Hangklip Mt. near Louis Trichardt; *Story* 4089 (PRE, SRGH) from Lydenburg, 18 miles from Spekboom River bridge on road to Penge Mine; and *Codd & Dyer* 9089 (PRE) Pietersburg: Blaauwberg.

A rather characteristic feature of *P. kilimandscharicum* is said to be the (usually not very dense) pubescence of long, more or less patent flexuous articulate hairs. This kind of pubescence is found in the three Transvaal specimens. The leaves in these specimens are larger and thinner in texture, the common male peduncle much longer and the male bracteoles more membranous than in *P. caledonicum* and in these respects they agree with East African material received as *P. kilimandscharicum*. There is however, a considerable gap in the distribution from Nyasaland to the Transvaal and additional gatherings in the Transvaal and in the "gap" are necessary before more definite conclusions can be drawn.

16. COCCINIA

Coccinia *Wight & Arn.*, Prodr. Fl. Pen. Ind. Or. 1: 347 (1834); *Cogn.*, Mon. Cucurb. 528 (1881); *Pax* in Pflanzenfam. 4, 5: 35 (1889); *Phillips*, Gen. ed. 2: 751 (1951). *Cephalandra* *Schrad.* apud *Eckl. & Zeyh.*, Enum. Pl. Afr. Austr. 2: 280 (1836); *Linnaea* 12: 407 (1838); *Sond.* in Fl. Cap. 2: 492 (1862); *Benth. & Hook. f.*, Gen. Pl. 1: 827 (1867); *Hook. f.* in Fl. Trop. Afr. 2: 550 (1871).

Dioecious perennial climbing, occasionally prostrate, often tall herbs with tuberous roots. *Stems* usually angular or sulcate. *Leaves* often angular to deeply palmatifid usually cordate at the base, with entire or dentate margins, sometimes with a few black glands on lower surface near the base between the main veins. *Tendrils* simple, rarely bifid. *Male flowers* subumbellately racemose (often with a solitary male flower at the base of the inflorescence in same axil) or solitary; receptacle short, cup-shaped to turbinate; sepals 5, linear or lanceolate; corolla-tube campanulate, lobes 5, broadly elliptic to broadly ovate, sometimes apiculate, submembranous, veined, often hairy

or papillose; stamens 3, inserted in the throat of the receptacle; filaments united or occasionally free, anthers cohering or connate to form a broad flattened structure, two 2-thecous, the third 1-thecous, locules conduplicate-sigmoid, connective narrow, not produced at the apex; rudiment of pistil none. *Female flowers* solitary; very rarely racemose; calyx and corolla as in the male; staminodes 3, oblong to subulate; ovary ovoid or subglobose to fusiform, with 3 placentas and many ovules; style columnar, stigma of 3 fleshy or flattened lobes. *Fruit* soft, ellipsoid or subglobose to oblong-fusiform, many-seeded. *Seeds* numerous, obliquely obovate to oblong, much compressed, conspicuously margined, smooth or nearly so.

Type species: *Coccinia indica* W. & A. (= *C. cordifolia* Cogn. non *Bryonia cordifolia* L.); the correct name is most probably *C. grandis* (L.) J. O. Voigt.

A genus of about twenty described species, found in Africa and Asia. The latest monographic treatment is by Cogniaux in 1881, but several species have been described since and a revision of the genus as a whole is highly desirable. The species treated here seem to be clear-cut. In my opinion, this genus belongs in the sub-family Cucurbitaceae, series Cucumerinae, as it is evidently related to the genera *Cucurbita*, *Lagenaria*, *Eureiandra*, *Peponium*, *Physedra* and *Adenopus* (Cogniaux included it in Sicyoideae)

- Tendrils bifid; plant glabrous..... 1. *C. palmata*
 Tendrils simple or some bifid, but if so, plant distinctly pubescent:
 Leaves sessile, their bases often more or less stem-clasping..... 2. *C. sessilifolia*
 Leaves distinctly petiolate:
 Whole plant (including calyx except corolla) glabrous or nearly so:
 Leaves without black glands at the base, the lobes often oblong or linear, if dentate, rather regularly so, usually not coarsely lobed or dissected, often rather wide to broadly rounded at the apex; basal sinus usually narrow; male flowers usually solitary (E. Cape)..... 3. *C. quinqueloba*
 Leaves almost invariably with a few black glands near the base on lower surface, the lobes usually more or less tapering towards the apex (though not necessarily acute); entire or dentate to lobed or coarsely pinnatisect; basal sinus usually broad and shallow (at any rate basal lobes never approximate or overlapping); male flowers usually racemose (Transvaal)..... 4. *C. variifolia*
 Plant more or less densely hairy on stems, petioles, leaves and/or calyx:
 Stems persistently hairy with soft curved or curly hairs; leaves without glands, not scabrid with raised pustules; male flowers solitary on pedicels usually exceeding 2 cm; ovary and fruit fusiform, tapering at the apex..... 5. *C. hirtella*
 Stems often glabrescent or, if retaining the pubescence, hairs stiff; leaves often with glands on the blade near the base beneath and/or scabrid with small raised pustules on upper surface or on both sides:
 Male flowers often solitary or fascicled; calyx and the subglobose ovary usually rather densely hairy with curved, rather soft, multicellular somewhat articulate hairs; fruit ellipsoid or subglobose, rounded at the apex; lobes of leaves generally lobulate to pinnatisect but margin not rather regularly callosa-dentate (often scabrid-subciliate)
 6. *C. rehmannii*
 Male flowers often racemose; calyx and the fusiform-oblong ovary thinly hairy with short stiff hairs to glabrous; fruit oblong-fusiform to oblong-ovoid, pointed at the apex; lobes of leaves usually not lobulate, but almost always rather regularly callosa-dentate..... 7. *C. adoensis*

1. *C. palmata* (Sond.) Cogn., Mon. Cucurb. 540 (1881); M. Wood, Handb. Fl. Natal 54 (1907); Bews, Fl. Natal & Zululand 202 (1921); Burt Davy, Fl. Transv. 1: 231 (1926). Type: Since Sonder took up E. Meyer's specific epithet, the basionym is the nomen nudum *Momordica palmata* E. Mey., typified by a *Drege* gathering (near Durban) in Herb. Sonder (nunc S).

Momordica? palmata E. Mey. ex *Drege*, Zw. Pflgeog. Doc. 156, 159, 202 (1843), nomen tantum. Type: *Drege* s.n. from near Durban, Natal (S, holo., H, iso.).

Cephalandra palmata (E. Mey.) ex Sond. in Fl. Cap. 2: 493 (1862). *C. mackenii* Naud. in Ann. Sci. Nat. 5me. sér. 5: 17 (1866). Type: Cultivated specimens raised from seed in France and Algeria, in P.

Coccinia mackenii (Naud.) Cogn., op. cit., 541.

Perennial glabrous or occasionally in young parts somewhat hairy climber. *Stems* up to 8 m long, branched, slender, sulcate. *Leaves* suborbicular to ovate-oblong in outline, firm, herbaceous to somewhat coriaceous, dark-green above, paler below, sometimes slightly glaucescent, smooth on both surfaces or finely punctate-scabrid on upper one, often with a few black glands near the base on lower one, deeply palmately 5-sect, 4–12 cm long and broad; the lobes ovate to oblong-lanceolate, acute or acuminate, the terminal one slightly larger than the two lateral ones, basal ones distinctly smaller; the margins from minutely and remotely denticulate to occasionally lobulate with the dentitions callous-toothed; sinuses between lobes usually subacute to rounded; basal sinus subrotundate to narrow; petioles slender, striate, 1–6 cm long. *Tendrils* bifid, often unequally so. *Male flowers*: peduncles 1- to racemously 8-flowered, slender, 2–10 cm long, one-flowered ones articulated at the apex; pedicels nearly filiform, articulated at the apex, 8–25 mm long; calyx glabrous, receptacle 3–6 mm long, 5–7 mm in diam., sepals 3–4 mm long; corolla pale yellow, 1–2 cm long; segments acute. *Female flowers*: peduncle up to 6 cm long; staminodes oblong, long-pubescent, 2–3 mm long, 1.5–2 mm broad; ovary oblong-linear to fusiform, glabrous, about 1.5 cm long. *Fruit* oblong-fusiform to narrowly ellipsoid, acute, red when ripe, 5–8 cm long, 2–3.5 cm in diam. *Seeds* dirty white, finely rugulose, 6.5–8 mm long, 3–4 mm broad and about 1.5 mm thick.

PORTUGUESE EAST AFRICA.—Sul do Save: Lourenço Marques, *Earthy* (1?) = Hb. no. 18612 (BOL).

TRANSVAAL.—Barberton: Barberton, Highlands Creek, *Galpin* 785 (BOL, GRA, NBG, PRE); *Williamson* 139 (PRE).

NATAL.—Utrecht: Glen Atholl farm near Charlestown and Volksrust, *Smith* 5752 (PRE). Nkandhla: Qudeni forest, *Gerstner* 6704 (PRE); *Codd* 6991 (PRE). Eshowe: *Lawn* 408; 472 (NH). Lion's River: Dargle, *Taylor* 2021 (PRE). Pietermaritzburg: *Canham* 38 (NU); *Randles* 2; 34 (NU). Verulam: Umhloti Beach, *Graham* 12 (NU). Durban: near Durban, *Drege* s.n. (sub. nom. *Momordica palmata* E. Mey. b. in L. iso.), *Rehmann* 8843; 8844 (BR); *Moss* 5054 (J); *F. Roberts* in Herb. Moss 18437 (J); *Pahl* Hb. no. 25383 (BOL); Berea, *Wood* 8446 (NH); 8579 (BOL, NBG, PRE); Isipingo Beach, *Ward* 289 (NU). Pinetown: "Illovo Valley", *Wood* 1863 (NH); Amanzimtoti, *Fisher* 496 (NU); Winkle Spruit, *Lansdell* Hb. no. 34284 (NH). Umzinto: Ifafa, *Handley* 63 (NU). Bergville: "Tiger Bush", *Bayer & McClean* 203 (PRE).

CAPE PROVINCE.—Port St. Johns: *Mogg* s.n. (PRE); *Pahl* Hb. no. 25386 (BOL). Umtata: Baziya, *Baur* 127 (BOL). Engcobo: *Lewis* Hb. no. 66631 (NBG, PRE). Mqanduli: between Mqanduli and Coffee Bay, *Lewis* Hb. no. 63402 (NBG). Kentani: *Pegler* 436 (PRE).

The identity of *Cephalandra mackenii* Naud. is quite clear. Mr. Killick compared authentic material from the Paris Herbarium and reported that, apart from the degree of lobing of the leaves, it is not distinct from the type of *Coccinia palmata*. The distinguishing character given by Cogniaux (1881), viz., male flowers solitary in *C. mackenii* and racemose in *C. palmata* is equally insufficient, because the flowers are often solitary or racemose on one specimen. The distribution is as indicated above by the cited specimens, i.e., mainly Natal and the Eastern Cape Province, extending to the extreme southern part of Portuguese East Africa and to the Barberton district of the Transvaal. All records from outside this area are, most probably, based on wrong identifications. The distribution and field notes indicate that *C. palmata* inhabits light forests, thickets and forest margins in lowland below 6,000 ft. in frost-free areas.

2. *C. sessilifolia* (Sond.) Cogn., Mon. Cucurb. 534 (1881); Dinter in Fedde, Repert. 16: 168 (1919–1920); Burt Davy, Fl. Transv. 1: 231 (1926).

Cephalandra sessilifolia Sond. in Fl. Cap. 2: 493 (1862). Syntypes: *Burke* 289, *Zeyher* 580 (K).

Bryonia? lagenaria E. Mey. ex Drege, Zw. Pflzgeogr. Doc. 54, 169 (1843), nomen tantum.

Coccinia schinzii Cogn. in Bull. Herb. Boiss. 3: 419 (1895); Burt Davy, l.c. (1926). Type: Transvaal, Klippan, *Rehmann* 5162 (Z, holo.).

Perennial, glabrous, herbaceous climber. *Rootstock* tuberous. *Stems* slender, branched, angular-sulcate, smooth, up to at least 5 m long. *Leaves* sessile to subamplexicaul, glaucous, herbaceous but firm, smooth or minutely punctate-scabrid, usually without any glands, deeply palmately 5-lobed, 3–12 cm in diam.; the lobes oblong-lanceolate, linear or oblong, usually acute and terminating in a mucro, coarsely dentate-lobulate or trifid, sinuses between the lobes rounded, basal sinus very narrow (basal lobes often overlapping at the opposite side of the stem), 1–4 cm deep. *Tendrils* simple. *Male plants*: flowers racemose or by reduction solitary; peduncles rather slender, terete, 1–6 cm long, up to 7-flowered; pedicels of racemose inflorescence articulate below the calyx, up to 2 cm long; receptacle glabrous, 3–4 mm high and 4–6 mm in diam.; sepals 1–3 mm long, 1–2 mm wide; corolla pale yellow to nearly white or sometimes pale dull orange-buff, strongly veined, sublanate to glabrous or papillose only. *Female plants*: pedicels stoutish, up to 1.5 cm long; staminodes ovoid-triangular or oblong-triangular, white or pale cream, pubescent at the base and on the sides with rather long stiff hairs, glabrous towards the obtuse apex, 2–3 mm long; style columnar, glabrous, 7–8 mm long; ovary oblong-fusiform, glabrous, about 1.8 cm long and 5 mm in diam. *Fruit* oblong-fusiform or elongated ellipsoid, acute, red when ripe, 6–9 cm long and about 2–3 cm in diam. *Seeds* compressed, ovate, attenuate at the one end, 6–9 mm long.

Type: Sonder, in the original diagnosis, cites three specimens, viz., *Burke* 289, *Zeyher* 580 and the *Drege* gathering of this species in Herb. Hooker and Herb. Sonder (S) without selecting a type. Burt Davy (l.c.) cites the *Burke* and the *Zeyher* specimens as the types and the Kew specimens ex herb. Hooker are to be taken as the syntypes.

Recorded from the following districts.—*South West Africa*: Outjo, Grootfontein, Otjiwarongo, Omaruru, Okahandja, Windhoek, Gobabis, Rehoboth; *Bechuanaland*: Mochudi, Kanye; *Transvaal*: Marico, Lichtenburg, Bloemhof, Klerksdorp, Potchefstroom, Brits, Johannesburg, Pretoria, Waterberg, Potgietersrus, Pietersburg, Lydenburg, Pilgrim's Rest, Letaba, Soutpansberg; *Orange Free State*: Kroonstad, Boshoff, Fauresmith; *Cape Province*: Vryburg, Barkly West, Hay, Kimberley, Herbert, Hope-town, Colesberg and Graaff-Reinet.

Some noteworthy specimens are *Burke* 289 from Mooi River, Potchefstroom, Transvaal (in PRE and SAM, one of the syntype numbers); *Burke* s.n. from "Orange River" (in PRE, the corresponding sheet in K has been annotated by Sonder); *Drege* s.n. (labelled "*Bryonia? lagenaria* E. Mey.") from "Nieuwe Hantam" (most probably Colesberg distr., Cape) in L, PRE; *Burchell* 2661 from Hopetown (in L) cited by Cogniaux; also cited by Burt Davy as having the male flowers both in racemes and solitary; *Nelson* 217 and *Rogers* Herb. no. 2377 (PRE), both also cited by Burt Davy; *Rehmann* 5161 (in BR) from "Klippan" was probably collected together with *Rehmann* 5162, the type of *C. schinzii*.

C. schinzii cannot be maintained, because the only difference is in the solitary or racemose male flowers which difference does not hold. Burt Davy already mentioned a specimen *Burchell* 2661 (K) annotated by Cogniaux (as *C. sessilifolia*) which has both solitary and racemose male flowers. *Rehmann* 5161 from "Klippan" (in BR)

is certainly *C. sessilifolia*. In addition, specimens observed near the historical "Klippan" (between Roedtan and Grass Valley in the Potgietersrus district) by the present author, like most specimens, may produce both types of male inflorescences on one branch. The same variation misled Cogniaux in other cases (see under *C. palmata* = "*C. mackenii*").

3. *C. quinqueloba* (Thunb.) Cogn., Mon. Cucurb. 533 (1881).

Bryonia quinqueloba Thunb., Prodr. Pl. Cap. 13 (1794); Fl. Cap. 35 (1807); Lindley, Bot. Reg. t. 82 (1815); Curtis, Bot. Mag. 43: t. 1820 (1816); Ser. in DC., Prodr. 3: 307 (1828). Type: Cape, Thunberg (UPS, holo.).

Cephalandra quinqueloba (Thunb.) Schrad. apud Eckl. & Zeyh., Enum. Pl. Cap. 280 (1834); Sond. in Fl. Cap. 2: 492 (1862); Naud. in Ann. Sci. Nat. 5me. sér. 5: 16 (1866).

Perennial herbaceous nearly glabrous climber. *Stems* slender, branched, angular-sulcate or smooth, up to 10 m long. *Leaves* glaucous above, paler beneath, smooth or minutely punctate-scabrid, sometimes minutely hispid, on the veins above, sub-orbicular in outline, deeply palmately (3-) 5-sect, 4–12 cm long and 3–10 cm wide; the lobes oblong, often somewhat wider near the usually rounded apex, entire or callose-denticulate, less often more coarsely dentate or with a few lobules, mucronate, the central one 2–7 cm long, 0.5–2.5 cm wide, the lateral ones gradually shorter; sinuses between the lobes rotundate; basal sinus very narrow (basal lobes of leaf sometimes overlapping) up to 2.5 cm deep; petioles slender, striate, usually slightly hairy, 1–3 cm long, occasionally shorter. *Tendrils* simple, striate, glabrous. *Male plant*: flowers solitary; pedicels subfiliform, 2–4 cm long or occasionally flowers in a few-flowered raceme; receptacle glabrous, 4–5 mm high, 6–7 mm in diam.; sepals triangular, triangular-lanceolate to ovate, 2 mm long, 1.5–2.5 mm wide near the base, patent or erecto-patent; corolla about 2 cm long, shortly pubescent. *Female plant*: pedicels stoutish, 1–2 cm long; staminodes oblong, densely lanate-shaggy, about 2 mm long; ovary oblong-linear, glabrous or nearly so, smooth, attenuate at the apex, 2–2.5 cm long, 3–4 mm in diam., style 8 mm long, glabrous. *Fruit* ellipsoid, bright red when ripe, acute at the apex, more or less rounded at the base, 4–6 cm long and 2.5–4 cm in diam. *Seeds* obovate, somewhat attenuate at the base, smooth, 6–7 × 4 × 1–2 mm.

CAPE PROVINCE.—Humansdorp: Taylor 1289 (PRE). Somerset East: MacOwan s.n. (GRA); Boschberg, Scott Elliot in Herb. Galpin no. 127 (PRE); Glen Avon, Brown s.n. (PRE); Zuurberg, Barker 39491 (NBG); Zuurberg Range (= Somerset East or Uitenhage), Holland 308 (GRA). "Woods in Uitenhage, Albany and Kaffirland", Ecklon & Zeyher 1796 (BOL, NH, SAM). Port Elizabeth: Van Staadens Mts., Paterson 996 (GRA, PRE); Marloth 1304 (PRE); Theron 570 (PRE); Kraggakamma, Zeyher 579 (BOL, SAM); West 300 9BOL); Enon. Thode A2666 (NH, PRE); Drege s.n. ("*Momordica quinqueloba* E. Mey. a" in L, PRE, SAM); Long 1340 (PRE); Powrie Hb. no. 25595 (BOL). Alexandria: Gledhill s.n. (GRA), Archibald 6085 (PRE); Comins 1373; 1374; 1376 (PRE). Albany: near Grahamstown, Dyer 1379 (GRA, PRE); Story 2346 (PRE); Howison's Poort, Schönland 664 (GRA); Blauwkrantz, Leighton 3135 (BOL). Bathurst: Port Alfred, Galpin 3041 (GRA, PRE); Becker s.n. (GRA); Kowie, Lotsy & Goddijn 278 (L). Stockenstrom: Katberg, Scully 316 (NH). East London: Gane 253 (PRE); Breyer Hb. no. 23225 (PRE); Munro Hb. no. 23161 (PRE); Smith 3631; 3813; 3861 (PRE); Compton 16982 (BOL); Cambridge, Wormald 128 (GRA). Komgha or Kentani ("Kei Mouth"): Schlechter 6245 (GRA); Pahl Hb. no. 25387 (BOL). Komgha: Flanagan 1712 (PRE). Queenstown: near Queens-town, Galpin 8118 (PRE). King William's Town: Pirie, Sim 20238 (PRE).

NATAL.—Port Shepstone: Umtentweni, Blake s.n. (J).

The specimens from tropical Africa cited under this name by Hook. f. in Fl. Trop. Afr. 2, 551, and by Cogniaux (1881) are most probably not conspecific. The plant hardly extends into southern Natal and the gap from this area to central Africa is too large to make it probable that the same species is found in the tropical zones.

This species is obviously closely related to *C. variifolia* but differs in a few apparently constant characters such as the absence of glands on the leaves which also have broader, rounded or obtuse and rarely acute leaf-segments and a more ellipsoid, shorter fruit. It is, in addition, geographically and ecologically separated from the other species. It occurs in coastal bush or slightly more inland, whereas *C. variifolia* is an inland form found in the more arid regions.

C. quinqueloba can usually easily be distinguished from the remaining S. African species but occasionally specimens with narrow leaf-segments resemble certain specimens of *C. palmata* with broad leaf-segments. The simple tendrils (bifid in *C. palmata*) make a clear distinction possible.

Sonder (in Fl. Cap.) already mentioned that *C. quinqueloba* can have solitary or subumbellately racemose flowers. Cogniaux (1881), p. 529, on the other hand, keyed it out in his group with solitary flowers. Cogniaux made the same mistake with *C. sessilifolia* (of which he described a specimen with racemose flowers as a different species, although Sonder had already reported "solitary or subumbellate flowers") and with *C. palmata* (he recognised *C. mackenii*, described by Naudin from a specimen of the latter with solitary flowers).

4. *C. variifolia* A. Meeuse, sp. nov., a foliis nunc angulatis vel leviter lobatis nunc profunde palmatifidis facile distinguenda.

Perennis, alte scandens, subglabra. *Radix* tuberosus carnosus fusiformis vel plus minusve napiformis ad 6 cm diam. *Caules* satis robusti, in siccitate longitudinaliter sulcati, ad 5 m longi. *Folia* firmiter herbacea vel subcoriacea ambitu late cordato-ovata vel cordato-suborbicularia vel ovata, 5-angulata vel leviter ad profunde palmatisecta 3-11 cm longa et lata, basi cordata apice obtusa vel acuta minute apiculata, supra viridia squamis albidis subsparse oblecta, infra pallidiora glauca pustulis minutis subsparis et prope basim glandulis paucis nigricantibus oblecta, margine leviter revoluta subciliata, lobis 5 interdum 3 vel 7 triangularibus vel ovatis vel rhomboideis vel lineari-oblongis subintegris vel remote leviterque sinuato-dentatis obtusis vel acutis mucronatisque, angustioribus interdum crasse pinnatilobatis, petiolis satis robustis longitudinaliter sulcatis 8-35 mm longis. *Cirrhii* simplices. *Flores masculi* racemosi interdum solitarii, pedunculis communibus ad 8 cm longis, pedicellis 2-4 cm longis interdum (in floribus solitariis) ad 9 cm longis, receptaculo campanulato vel obconico striato 3-5 mm longo 4-6 mm lato, sepalis lineari-lanceolatis acutis 4-7 mm longis 0.5-1 mm latis, corolla pallide ochracea 18-22 mm longa lobis acutis mucronatisque extus praecipue ad nervos sparse minute pubescentibus apicem versus ciliatis. *Flores feminei* solitarii, pedicellis brevibus, ovario subcylindrato vel fusiformi glabro. *Pepo* oblongo-ellipsoideus vel oblongo-fusiformis, immaturus viridis albo-variegatus demum coccineus, 5-8 cm longus, 2.5-3.5 cm diam. *Semina* 7-8 mm longa, 4-5.5 mm lata, 1-3 mm crassa.

TRANSVAAL.—Waterberg: Vaalwater, *Meeuse & Strey* 10413 (male plant, PRE, holo., B, BM, BOL, BR, EA, K, L, M, P, SRGH, isos.); 10413 bis (PRE, female plant); "Palala River", *Breyer* TRV no. 25226; Rietspruit near Nylstroom, *van Dam* TRV 23372; Naboomspruit, Mosdene, *Galpin* s.n. Warmbaths: 11 Km from Warmbaths on Nylstroom Road, *Stony* 1525; near Warmbaths, *Bolus* 11893; *Leendertz* TRV no. 7579; *Acocks* 13903.

A tall perennial climber, nearly glabrous in all its parts except the very young portions of the shoots and the corolla, producing several branched annual stems from the apex of a fusiform to turnip-shaped fleshy perennial tuberous root. *Stems* rather stout, firm, branched, longitudinally sulcate, up to 5 m long. *Leaves* varying in one plant from undivided, pentagonal-cordate to shallowly or very deeply palmatilobed with usually 5 broadly triangular to rhomboid or oblong to linear-oblong lobes, of which the lowermost are the smallest and sometimes so small that the leaf is almost 3-lobed, or they have occasionally a basal lobule so that the leaf is apparently 7-lobed; blade 3–11 cm long and broad, lobes subentire or more or less remotely callosodenticulate (in shallowly lobed leaves) to coarsely pinnatilobed (in deeply dissected leaves) obtuse or subacute with minutely apiculate or mucronate apex, with a slightly reflexed subciliate margin, green and rather sparsely covered with small flat round scales above, occasionally nearly smooth; paler, glaucous and sparsely punctate with minute pustules below and in addition often with a few black adpressed glands between the main veins near the base; quite glabrous or rarely hirtellous-scabrid on lower surface near base on main veins; basal sinus usually broad and shallow or blade nearly truncate at the base. *Petioles* longitudinally sulcate, in older leaves firm, often with a few longitudinal lines of scabrid minute stiff hairs, 8–35 mm long. *Tendrils* simple. *Male flowers* usually in subumbellate racemes with a solitary flower at the base of the inflorescence in the same axil; common peduncle rather slender, up to 8 cm long; pedicels of solitary flowers often equalling the peduncles, those of the raceme much shorter; calyx campanulate or obconical, 3–5 mm long, 4–6 mm in diam. at the apex; sepals linear-lanceolate, acute, 4–7 mm long, 0.5–1 mm broad, corolla pale buff-yellow, 18–22 mm long, its lobes acute, mucronate, shortly and sparsely pubescent, ciliate mainly near the apex. *Female flowers* solitary on short pedicels; ovary cylindrical to fusiform, glabrous. *Fruit* ellipsoid-oblong or somewhat fusiform, green mottled with white when immature, turning scarlet when ripe, 5–8 cm long and 2.5–3.5 cm in diam. *Seeds* numerous, 7–8 mm long, 4–5.5 mm broad and 1–3 mm thick.

This species was collected for the first time over 50 years ago but had always been wrongly identified as *C. palmata* or *C. quinqueloba*. It differs from the first in the simple tendrils, among other things, and from the second in several minor points: the variable leaf-shape, longer inflorescence, larger fruit, paler glaucous lower leaf-surface, etc. Mr. Killick kindly compared specimens with the material at Kew and gave as his opinion that it is a distinct species, not matched at Kew except by some of the cited gatherings (e.g. *Bolus* 11893). It has apparently a restricted area of distribution. The striking variation in leafshape is a character not present to such an extent in any other species, hence the epithet chosen.

5. *C. hirtella* *Cogn.* in *Bull. Herb. Boiss.* 4: 821 (1896); M. Wood, *Handb. Fl. Natal* 54 (1907); Phillips, *Ann. S. Afr. Mus.* 16: 101 (1917); Bews, *Fl. Natal and Zululand* 202 (1921). Type: *Schlechter* 6775 from Howick, Natal (Z holo.; BR, GRA, isos!).

Perennial, forming annual stems from a fusiform rootstock. *Stems* several to many, climbing mainly over low bushes or occasionally prostrate, usually rather stout, herbaceous, longitudinally sulcate, when young densely, later thinly covered with somewhat bent or wavy, flattened, drab, fawn or sometimes whitish hairs, up to at least 3 m long. *Leaves* herbaceous, soft, dark green, slightly paler beneath, suborbicular-cordate to ovate-cordate in outline, palmately lobed or 5–7-sect to usually a little beyond the middle, on both surfaces thinly covered with the same hairs as found on the stems or a little more densely so on lower surface and always more densely so on main veins on lower surface, 4–10 cm long and 3–9 cm broad; basal sinus usually shallow and wide; lobes ovate, obovate, elliptic or ovate-lanceolate, acute or shortly apiculate to obtuse or rounded or sometimes attenuate into an acute point at the apex, usually contracted at the base, somewhat irregularly denticulate to rather coarsely dentate

or serrate-dentate, not infrequently some of them or all pinnately lobulate; the middle lobe slightly longer, the other ones gradually shorter towards the base; sinuses between the lobes usually narrow, rounded at their base; petioles covered with the same hairs as the stems but much more densely so, somewhat flattened above, 1-4.5 cm long. *Tendrils* simple or bifid, thinly covered with the same hairs as stems, leaves and petioles, glabrescent, striate-sulcate at least in lower portion. *Male plants*: flowers solitary or rarely geminate; pedicels long and slender, finely sulcate, up to 15 cm long; receptacle broadly cup-shaped, 4-5 mm high, 6-8 mm in diam. at the mouth, thinly to more or less densely hairy like pedicels and vegetative parts; sepals lanceolate-subulate, 4-7 mm long, hairy; corolla apricot yellow to pale buff with green venation on outside, 19-23 mm long; shortly hairy mainly on the veins outside; petals acute to acuminate. *Female plants*: flowers solitary pedicels short, slightly thicker than in the male plants, in fruit incrassate, strongly sulcate, glabrescent, up to about 4 cm long; ovary fusiform, densely villous-lanate with the same type of hairs as found on the other parts, 2-2.5 cm long and 4-5 mm in diam. *Fruit* oblong-fusiform or ovoid-fusiform, more or less rounded at the base and attenuate to apiculate into an acute apex, at first longitudinally marked with green bands more or less anastomosing over intervening greyish white or yellowish bands, when ripe bright orange-red, nearly glabrous, 7-8 cm long and 2.5-4 cm in diam. *Seeds* nearly smooth, 6-7 mm long and 3-4 mm wide.

TRANSVAAL.—Wakkerstroom: *Beeton* 60 (SAM).

NATAL.—Utrecht: Kaffir drift, *Thode* A272 (NH, PRE); Tweekloof, Altemooi, *Thode* A187 (NH, PRE). Weenen: *Wood* 1001 (GRA, PRE). Estcourt: near Mooi River, *Wood* 4105 (NH, BOL); Rietvlei, Greenwich Farm, *Fry* in Hb. Galpin no. 2773 (PRE); Kamberg, *Gordon Gray* 58 (NH). Umvoti: Greytown, *Wylie* Hb. no. 20464 (NH). Lion's River: 8 miles S. of Nottingham Road, *N. R. Smuts* 1031 (PRE); Howick, *Schlechter* 6775 (GRA, BR, isotypes). Impendhle: *Huntley* 412 (NU, PRE), 482a (NU). Pietermaritzburg: *Smith* s.n. (PRE); Zwartkop, *Rogers* 1139 (GRA). Pietermaritzburg or Camperdown: near Hilton Road, *Dimock Brown* 218 (NH). Camperdown: between Inchanga and Drummond, *Eshuis* (PRE); Drummond, *Galpin* 10277 (PRE). Umzinto: Dumisa, Kenterton, *Rudatis* 2003 (NH).

ORANGE FREE STATE.—Bethlehem: *Bolus* 8162 (BOL), *Flanagan* 1828 (PRE, SAM). Ficksburg: Molenspruit, *Galpin* s.n. (BOL); Fouriesburg, *Gemmell* 6150 (PRE).

BASUTOLAND.—Leribe, *Dieterlen* 145 (BR, NH, PRE, SAM); Memanieng Stream, *Jacot-Guillarmod* 2204 (PRE); Mamathes, *Jacot-Guillarmod* 1969 (PRE).

CAPE PROVINCE.—Wittebergen (Herschel, Lady Grey or Barkly East): *Mrs. Barber* 751 (GRA). Mount Currie: *Tyson* 1432 (BOL, NH, SAM); New Amalfi, Vielsalm, *Forbes* 1124 (NH). Xalanga: Cala, *Flanagan* 2840 (PRE, SAM), *Bolus* 8910 (BOL).

6. *C. rehmannii* Cogn. in Bull. Herb. Boiss. 3: 418 (1895), aggregate species.

This species is, generally, an inland form, mainly found in dry sandy areas, but some specimens of a slightly different habit and occurring in somewhat moister coastal areas seem to constitute a variant of this typical form. They differ in a number of minor points and are treated here as a variety of the typical *C. rehmannii*.

Stems usually soon glabrous, in older parts covered with greyish or silvery white adpressed scaly specks; leaves firm; male flowers almost invariably solitary on pedicels which are rarely over 2 cm long, rarely fasciculate to racemose with a very short common peduncle (*a*) var. *rehmannii*. Stems usually remaining hirsutulous much longer, in older parts not bearing whitish scaly specks; leaves thinner in texture, drying membranous; male flowers often fasciculate on pedicels usually 3-9 cm long, occasionally racemose, the common peduncle attaining a length of 8.5 cm. (b) var. *littoralis*

(a) *C. rehmannii* Cogn. var. *rehmannii*.

C. rehmannii Cogn., l.c., Burt Davy, Fl. Transv. 1: 231 (1926). Type: *Rehmann* 5168 from "Klippan", Potgietersrust, Transvaal (Z, holo., BR!, K, isos., photos in PRE). *C. ovifera* Dinter et Gilg ex Dinter in Vegetab. Veldkost D.S.W. Afr. 16 (1912), nomen subnudum, et in Fedde, Repert. 16: 168 (1919), nomen tantum.

Stems usually climbing, older ones perennial, several meters long, up to 2 cm in diam., not forming a corky bark but retaining a greyish or greyish-green rather smooth outer layer, covered mainly on the angles with whitish or greyish longitudinally arranged elliptic or oblong scaly specks; younger stems firmly herbaceous, rather slender, angular and sulcate, when quite young usually rather densely covered with a short pubescence but as a rule soon glabrous. *Leaves* rather rigidly herbaceous, paler on lower surface, pentagonal-suborbicular or pentagonal-cordate in outline, generally deeply palmately 3 (-5)-lobed; rarely shallowly 5-lobed, on both surfaces hairy when quite young but usually soon glabrescent and becoming scabrid with raised small pustules, or on the upper surface with adpressed whitish scales; the main nerves usually retaining some short setose hairs; the margin slightly thickened, somewhat cartilaginous and scabrid, ciliate with short curved aculeate hairs; the lobes of the lamina usually coarsely and jaggedly lobulate to coarsely pinnatisect with acute or subacute narrowly oblong to linear, mucronate lobes and lobules, more rarely the lobes broader, somewhat rhomboid or oblong-cuneate, with coarsely dentate to subentire margins and sometimes rounded, often abruptly cuspidate-mucronate apex, very rarely (in shallowly palmatilobed leaves) the lobes ovate-triangular to broadly triangular, dentate, acute; the basal sinus usually deep and rather narrow; lamina usually 3-6 cm long and as wide, rarely attaining 11 × 11 cm; petioles somewhat dorso-laterally flattened, angular-sulcate and bearing on the ridges (mainly on the lateral sides) rows of stiff short bristly hairs, sometimes ultimately glabrescent, usually under 2 cm long but occasionally attaining 4 cm. *Tendrils* simple, usually slender, at first somewhat hispidulous mainly towards the somewhat incrassate base, but as a rule soon quite glabrous. *Male flowers* solitary or occasionally fasciculate, rarely racemose on a short (up to about 1 cm long) common peduncle; pedicels under 3 cm, but almost always under 2 cm long, slender to almost filiform, subterete or somewhat angular, somewhat hairy, at the apex under the calyx with an articulation which appears somewhat peltate after the flower has fallen off. *Calyx* hairy with curved multicellular, articular hairs, usually rather densely so, rarely subglabrous; receptacle obconical to somewhat cup-shaped, 4-6 mm high and 6-9 mm in diam., sepals linear-lanceolate, tapering into a subulate apex, 6-9 mm long and 0.5-1 mm wide. *Corolla* cream to pale yellow, often with a buffy tinge, green-veined, hairy on the main veins, 22-28 mm long; the lobes somewhat triangular and cuspidate-mucronate at their tips. *Female flowers* solitary; pedicels usually under 1 cm but occasionally up to 2 cm long, somewhat sulcate, rather slender but incrassate and up to 4 mm thick in fruit. *Ovary* fusiform-ellipsoid to broadly ellipsoid, usually densely pubescent with curved articulated multicellular hairs but occasionally glabrous, about 1 cm long. *Sepals* linear-lanceolate or somewhat oblanceolate, 3-6 mm long. *Corolla* as in the male flower. *Fruit* subglobose or broadly ellipsoid, sometimes contracted at the base just above the stalk, when young white-and-green mottled, the white spots in rather vaguely defined longitudinal bands, when ripe quite smooth and glabrous, turning scarlet, 3-4.5 cm long and 2-3.5 cm in diam. *Seeds* a dirty white, oblong or somewhat falcate, rounded at the apex, usually somewhat contracted above the truncate to faintly bilobed base, 6-7 mm long, 2.5-3 mm broad and about 1.5 mm thick.

This typical form is very wide-spread in South West Africa, Bechuanaland, parts of Griqualand-West and the Transvaal and extends into Southern Rhodesia and Northern Natal. The type specimen was collected at "Klippan", which is on a farm now called "Doornpoort", near Grass Valley, in the Potgietersrust district. The plant is very common in that area. It has been recorded from the following districts.—*South West Africa*: Ovamboland, Outjo, Okavango, Grootfontein, Otjiwarongo, Gobabis, Rehoboth, Warmbad; *Bechuanaland*: almost the whole area; *Transvaal*: Marico, Warmbaths, Brits, Pretoria, Bronkhorstspuit, Groblersdal, Lydenburg, Pilgrims Rest, Nelspruit, Barberton and districts to the north of these; *Cape*

Province: Kimberley, Barkly West, Hay, Herbert, Kenhardt, Prieska, Little Namaqualand; *Portuguese East Africa.* Lourenco Marques; *Southern Rhodesia:* Melsetter, Rupisi, Fort Victoria, Ndanga, West Nicholson, Bulalima–Mangwe.

The plants described as *C. ovifera* are not clearly separable from *C. rehmannii* as was evident from a comparison of specimens named *C. ovifera* by Dinter himself; the leaves are only slightly lobed and the fruits larger than in "typical" *C. rehmannii*, but only cultivation of both forms from seed may decide the status of *C. ovifera*; for the moment it is retained in *C. rehmannii*.

The juicy fruits and the tuberous roots of this plant are edible and are used for food by Hottentots, Damaras, Bushmen and presumably other native tribes in South West Africa and Bechuanaland.

This plant apparently prefers sandy soils in a fairly dry to dry but not very arid climate and is resistant to light frosts. Its distribution clearly indicates a preference for sandy regions without severe frosts. Especially in the Transvaal one can clearly see that it does not occur in the real highveld districts but practically everywhere else in suitable localities.

(b) *C. rehmannii* Cogn. var. *littoralis* A. Meeuse var. nov., a typo pedicellis masculis saepius fasciculatis longioribusque foliis membranaceis differt. Type: *Flanagan 457* from Komgha, Kei Mouth, in National Herbarium, Pretoria (male and female plant on one sheet).

Stems shortly setose-hispid, ultimately glabrescent but apparently not becoming covered with adpressed scaly specks with age. *Leaves* usually larger and more thinly herbaceous than in the var. *rehmannii*, drying membranaceous; its lobes triangular or oblong to ovate, sometimes suborbicular-cuneate, callose-dentate, sometimes subentire or irregularly dentate to pinnatilobulate, but not so distinctly pinnatisect as is usually the case in the var. *rehmannii*. *Male flowers* fasciculate or racemose, rarely solitary; common peduncle of raceme up to 8.5 cm long; pedicels up to 9 cm long. *Female flowers:* pedicels generally longer than in the var. *rehmannii*, 1.5–3.5 cm long. Otherwise as the var. *rehmannii*.

PORTUGUESE EAST AFRICA.—Distr. unknown (Sul do Save?): "Mussaril e Cabeceira", *Rodrigues de Carvalho* s.n. (COI). Sul do Save: Lourenco Marques, Inhaca Island, *Breyer* TRV 20506 (PRE); *Mogg* s.n. (PRE); *Noel* s.n. (PRE); Lourenco Marques, *Schlechter* 11555 (BOL, GRA, COI); *Hornby* 4599 (PRE); *Junod* 20 (BR); *Borle* 253; 427; 442 (PRE); Katembe, *Schlechter* 11614 (GRA); Inhachingo, *Exell*, *Mendonca & Wild* 630 (SRGH); Massinga, *Exell*, *Mendonca & Wild* 645 (SRGH).

NATAL.—Ingwavuma: Ndumu Game Reserve, *Ward* 3169; 3170; *Oatley* C 15 (PRE). Ubombo: Manaba Store, *Gerstner* 3407 (NH); Ubombo coastal veld, *Tosh* 28 (NU). Hlabisa: 10 miles N.W. of Mtubatuba, *Codd* 9620 (PRE). Mahlabatini: Dhlebe, *Gerstner* 4261 (PRE, NH). Umvoti: Thorns near Greytown, *Wood* 5318 (NH). Mtunzini: *Johnson* 612 (NBG). Verulam: Umhlanga Rocks, *Dohse & de Winter* 223 (NH, PRE). Durban: near Durban, *Jenkins* TRV no. 7092 (PRE); *Wood* 6350 (BOL, L, NBG, NH, PRE); Stella Bush, *Marriott* Hb. no. 24341; 27143 (NH); Berea, *Small* Hb. no. 34714 (NH). Pinetown: Doonside, *Wylie* Hb. no. 23299 (NH). CAPE PROVINCE.—Mqanduli: Coffee Bay, *Tyson* 24 (PRE, GRA). Komgha: Kei Mouth, *Flanagan* 457 (PRE, holo.!, BOL, GRA, NGB, isos.!). East London: Nahoon, *Nanni* 151 (PRE); Shelly Beach, *Mogg* 11941; 12070 (PRE).

The specimens from the dry thornveld of Northern Zululand are more or less intermediate between this variety and the var. *rehmannii* (e.g., *Ward* 3169, 3170, *Oatley* C 15, *Codd* 9620), but the forms from the wet coastal bush are more typical of the var. *littoralis* (e.g., *Tyson* 24, *Flanagan* 457, *Mogg* 11941, 12070).

In a list of plants collected by Junod, Schinz in Mém. Herb. Boiss. 10: 69 (1900) mentions "*Cocinia jatropaefolia* (A. Rich.) Cogn. var. *australis* Cogn." (nomen tantum!), citing Junod 20 and 463. A sheet of Junod 20 in BR is *C. rehmannii* var. *littoralis* and it has no relationship with *C. jatropaefolia* which I regard as a synonym of *C. adoensis*.

7. *C. adoensis* (Hochst. ex A. Rich.) Cogn., Mon. Cucurb. 538 (1881); Burt Davy, Transv. 1: 231 (1926).

Momordica adoensis Hochst. ex A. Rich., Tent. Fl. Abyss. 1: 293 (1847). Type: Schimper 166 from Abyssinia (P, holo.; K, L, M, isos.).

Bryonia convolvuloides A. Rich., l.c. *B. jatropaefolia* A. Rich. op. cit. 289.

Cephalandra pubescens Sond. in Fl. Cap. 2: 493 (1862); Hook. f. in Fl. Trop. Afr. 2: 551 (1871).

Cocinia jatropaefolia (A. Rich.) Cogn., l.c. *C. parvifolia* Cogn. in Vtjschr. Naturf. Ges. Zürich 52: 419 (1907); Burt Davy l.c. *C. pubescens* (Sond.) Cogn. ex Harms in Notizbl. Bot. Gart. Berlin 8: 491 (1923). *C. roseiflora* Suesseng. in Trans. Rhodesia Sci. Assoc. 43: 60 (1951).

Tall climber. *Stems* usually slender, branched, longitudinally sulcate, when young densely and shortly hispid-pubescent, more or less glabrescent, up to at least 6 m long. *Leaves* varying from ovate-cordate and undivided to deeply digitately 3–7-lobed; deep green drying green or dark brown above, pale greyish to glaucous green below, herbaceous, when dry thin but rather firm, usually more or less shortly hirsutulous-pubescent on both surfaces, usually only persistently so on the main veins (especially on lower leaf-surface), rarely quite glabrous when old, but very often the leaf-bases of the short stiff hairs persistent as fine punctations and leaf more or less scabridulous; black glands near leaf-base on lower surface sometimes present; overall length of blade 4–12 (–16) cm, width 3–10 (–17) cm; basal sinus usually shallow or leaf truncate to subcordate at base, rarely sinus narrow and deeper; margin finely and rather regularly callosodentate to subentire; lobes of lobed leaves varying from oblong or triangular to linear-lanceolate or oblanceolate, in more deeply dissected leaves almost invariably contracted at the base and acute or acuminate, in less dissected (and apex of entire) leaves sometimes obtuse to rounded, lobes usually entire, rarely lobulate; veins usually distinctly prominent on lower surface; petioles longitudinally striate in dry specimens, at first densely later more thinly covered with short subsetulose or hirsutulous hairs, rarely becoming quite glabrous, 0.5–4 cm long. *Tendrils* simple, usually slender, at first covered with the same type of short stiffish hairs as stems, leaves and petioles, later glabrescent. *Male flowers* usually racemose; common peduncle up to 12-flowered, usually slender, longitudinally sulcate in dried specimens, more or less hairy with short stiffish hairs, up to 10 cm long; pedicels in raceme erect-patent, somewhat hairy, articulated at the apex, up to about 20 mm long, those of solitary flowers (and solitary flowers in same axil as the raceme) attaining about 7 cm; calyx glabrous or hairy with short stiff hairs, receptacle broadly campanulate to semi-globose, narrowed at the base, 5–7 mm high and 7–9 mm across at the mouth, sepals linear-subulate, usually recurved, 2–4 mm long; corolla light buff or pale ochre-yellow to dull orange or a salmon-yellow, 1–2 cm long, finely and sparsely papillose-pubescent, segments apiculate. *Female flowers*: peduncles up to about 2 cm in fruit; ovary fusiform, glabrous or nearly so; calyx and corolla slightly smaller than in the male; receptacle very short. *Fruit* ovoid-acute or ellipsoid to oblong, red when ripe, rounded at the base and usually conical-acute at the apex, 4.5–5 cm long and 2–3 cm in diam. *Seeds* obovate in outline, dull white, smooth, 4–6 mm long, 3.4–5 mm broad and 1.5–2 mm thick.

Type: The name "*Momordica adoensis* Hochst." appeared for the first time on the herbarium labels of Schimper 166. The holotype is in P, isotypes in K (photo. in PRE!), L! and M!

This plant has the widest distribution in Africa of all the South African species. Specimens have been seen from Abyssinia, East Africa, Northern Rhodesia to the extreme N.E. corner of South West Africa, Northern Bechuanaland and the Transvaal, but apparently this species prefers semi-arid conditions and is absent from the wetter areas in East Africa, Natal, etc., but is, e.g., found in the Estcourt area in the drier thornveld of central Natal.

Recorded from the following districts.—*South West Africa*: Grootfontein; *Bechuanaland*: as far south as Mochudi; *Transvaal*: Rustenburg, Krugersdorp, Johannesburg, Pretoria, Middelburg, Lydenburg, Pilgrims Rest, Belfast, Barberton and districts to the north of these; *Natal*: Estcourt.

As regards the synonyms, the type of *C. jatrophaefolia* (Quartin Dillon & Petit s.n. in P) is indistinguishable from some forms of *C. adoensis*. Mr. Killick matched several S. African specimens to this specimen.

Cephalandra pubescens, based on the gatherings Burke 408 (K, holo, photo. PRE!, NBG, iso.!) and Zeyher 588 is indistinguishable from *C. adoensis*; the types are a good match of the type of the latter.

Coccinia parvifolia Cogn. based on Junod 2491 (type in Z!) is a form with undissected leaves. Such forms are linked through intermediates with the usual form with palmately dissected leaves. *C. roseiflora* Suesseng. is based on a water-colour made by Mrs. G. Dehn (no specimen!) in M, which I have seen. The plate is rather poor and the identification from it almost impossible. The practice of describing nowadays species from plates must be strongly deprecated. All the evidence points to *C. adoensis* (whose flowers sometimes have a pinky tinge) as its identity, the only alternative being *C. sessilifolia*.

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