

The South African Convolvulaceae.

By

A. D. J. Meeuse.

Recent work on the Convolvulaceae of the Transvaal made it evident that the account in the *Flora Capensis* requires revision. Several name changes have to be made and many new records incorporated.

The first important contribution to our knowledge of the South African Convolvulaceae was made by Thunberg who described or mentioned about 12 species. Choisy in *DC., Prodr.* 9 (1845) added many species collected by Burchell, Ecklon, Zeyher and Drège. H. Hallier (fil.) revised the family, beginning with his paper on the "natural system" of the Convolvulaceae in *Engl. Bot. Jb.* 16: 453-591 (1893), and treated the African Convolvulaceae in a series of papers, the most important of which are in *Engl. Bot. Jb.* 18: 81-160 (1893), 28: 28-54 (1899) and in *Bull. Herb. Boiss.* 6: 529-548 (1898), 7: 41-55 (1899). Hallier's system has been generally followed with only minor changes. His works, together with publications by Engler in *Engl. Bot. Jb.* 10:53-56 (1888), by Schinz in *Verh. bot. Ver. Brandenb.* 30: 270-276 (1888), by Baker in *Kew Bull.* 1894: 67-74 (1894) and by Rendle in *Jl. Bot.* 39: 12-22, 55-64 (1901), 40: 189-191 (1902), were the main sources of reference for the treatments of the Convolvulaceae in the *Flora Capensis* 4, 2 (1904) by Baker and Wright and in the *Flora of Tropical Africa* 4, 2 (1905-1906) by Baker and Rendle. Since these publications only few papers treating species from Southern Africa have been added. Pilger continued Hallier's papers on *Convolvulaceae Africanae* in *Engl. Bot. Jb.* 41: 293-297 (1908), 45: 218-222 (1910) and 48: 348-352 (1912); N. E. Brown published on the collections made by the Lugards in Ngamiland (*Kew Bull.* 1909, Convolvulaceae p. 122-125). These publications are important for the area under discussion because they deal with species some of which were described or have since been recorded from the Union. A monograph of the genus *Cuscuta* by Yuncker appeared in 1936.

The genera were treated by E. P. Phillips in his *Genera of South African Flowering Plants* (Ed. 2, 1951). The delimitations of a few genera differ slightly from those given by Phillips and several genera not mentioned by Phillips prove to occur in the Union. The delimitations given here are in agreement with those in the *Flora of West Tropical Africa* and in *Flora Malesiana*, Ser. 1, Vol. 4, part 4 (1953). Recently G. Roberty, in *Candollea* 14: 11-60 (1952-1953), proposed a new system for the Convolvulaceae. He described eight new genera, reinstated some eight others and at the same time reduced to synonymy some genera of long standing. The few new genera proposed since Hallier's system were mostly omitted, and among other things several violations of the International Code were committed; for instance, the type species of the genus *Evolvulus* (*E. nummularius* L.) is the basis of a new genus, *Volvulopsis* Roberty. There seems no improvement on Hallier's system, which has stood essentially unchanged and unchallenged for sixty years, and Roberty's treatment is not supported here.

Material of the following herbaria was studied, apart from the collection of the National Herbarium (PRE): BOL, COI, GRA, J, JE, KMG, L, LM (= Herbarium of the Repartição Técnica de Agricultura, Lourenço Marques), NBG, NH, NU, SAM, US (US only *Cuscuta*). The abbreviations are those of the *Index Herbariorum*. Thanks are due to the Directors of these herbaria for kindly sending their material on loan to the National Herbarium.

I am much indebted to Mr. B. de Winter and Mr. D. J. B. Killick, South African botanists at Kew, who assisted greatly in comparing types, looking up literature not available locally and supplying other information. I also wish to express my gratitude to Dr. S. J. van Oostroom (Leiden), Dr. T. G. Yuncker (Greencastle, Ind.) and Dr. B. Verdcourt (Nairobi) for helpful advice.

Specimens are not quoted unless there are only a few records of a species or if they are interesting for some other reason; specimens from outside the area are cited only in exceptional cases.

FAMILY CHARACTERS.

Flowers hermaphrodite (very rarely unisexual), minute to large, often showy, regular, rarely slightly zygomorphic, generally axillary, solitary or cymose, often aggregated into heads, rarely paniculate or approximated in a terminal spike, pedicelled or sessile, but the cymes usually peduncled; as a rule solitary flowers or cymes with 2 bracteoles (or bracts), these bracteoles either small or occasionally large, often deciduous but sometimes persistent and accrescent. *Calyx* inferior, sepals 5, rarely 4 or 3, free or rarely united at the base, much imbricate, equal or more or less unequal, persistent, often, especially the outer, accrescent. *Corolla* gamopetalous, usually funnel-shaped, but sometimes hypocrateriform, campanulate, nearly tubular, urceolate or rotate; the limb subentire or 5-lobed, more rarely 5- (or 4- or 3-) partite, in bud generally induplicate-valvate, often contorted, glabrous inside, frequently more or less distinctly marked on the outside by more or less hairy and veined midpetaline zones (which are outside in the bud), separated by glabrous episepaline areas. *Stamens* 5, rarely 4 or 3, inserted low down in the corolla-tube opposite the sepals or sometimes in the throat (*Cuscuta*); filaments equal or unequal, filiform, generally dilated and/or glandular-hairy at the base, rarely stipulate, rarely attached to scales; anthers introrse, ovate or oblong to nearly linear, often more or less sagittate at the base, dorsifixed, dehiscent longitudinally; pollen either spherical and spinose all over (*Echinoconiae* Hall.f.) or more or less spherical and smooth or ellipsoid and marked with folds (*Psiloconiae* Hall.f.). *Hypogynous disc* annular or cup-shaped, often shallowly 5-lobed, sometimes obsolete. *Ovary* superior, built up by 2 (rarely 3) united carpels, 2 (or 3)-loculated, sometimes only 1-chambered or by development of spurious septa 4-celled, usually entire but occasionally 2- or 4-partite; ovules 2 in each carpel, rarely solitary, erect, anatropous, sessile; style terminal or rarely gynobasic, filiform, simple or more or less deeply 2-fid; or styles 2, very rarely 3, equal or unequal, rarely reduced; stigma terminal and entire or bilobed, rarely 3-lobed, or stigmas 2 (rarely 3 or 4) globose, ellipsoid, filiform, or flattened, elliptic or linear, rarely peltate. *Fruit* 1-3-, or spuriously 4-celled, mostly a capsule dehiscent by valves or more rarely transversely or irregularly dehiscent, sometimes indehiscent with membranous, leathery, woody or fleshy pericarp. *Seeds* as many as there are ovules or less by abortion, becoming triquetrous on the inner face by mutual pressure, convex on the back, glabrous or hairy (especially on the angles), sometimes verrucose; embryo straight; radicle directed towards the hilum; cotyledons foliaceous, generally folded or spirally coiled, often with emarginate or bilobed apex, sometimes small or 0 (in *Cuscuta*); endosperm scanty to fairly copious, between the folds of the cotyledons. Annual or perennial herbs or woody plants without tendrils, unarmed or rarely spinescent, often climbing or prostrate, more rarely erect and shrubby, very rarely trees. *Roots* in herbaceous perennials often developed as thick taproots or as large fusiform to globose tubers. *Leaves* alternate, simple, often cordate, hastate or sagittate at the base, entire, lobed or deeply pinnately, palmately or pedately dissected, exstipulate but occasionally pseudostipulate by the leaves of developing or suppressed axillary shoots, usually petiolate, rarely absent or reduced to minute scales (*Cuscuta*).

Note.—The structure of the fruit is an important distinguishing character between genera and to overcome this difficulty the species belonging to the genera *Stictocardia* and *Turbina* are included in the generic key of *Ipomoea*.

Another character of importance is the structure of the surface of the pollen, i.e., whether it is smooth or spinulose, but this is only used in the key where it cannot be avoided.

Key to the Genera.

- Leaves reduced to minute scales or absent. Flowers small, usually in clusters, often numerous; herbaceous twining parasites..... 1. *Cuscuta*.
- Leaves well-developed, green:
- Ovary 2- or 4-lobed and fruit split into 2 or 4 lobes; styles 2 (sometimes connate below), inserted between the lobes of the ovary; small prostrate herbs with oblong or cordate to reniform leaves:
- Ovary 2-cleft with 2 ovules in each chamber; fruit 2-lobed..... 2. *Dichondra*.
- Ovary 4-cleft with 1 ovule in each chamber; fruit 4-lobed..... 3. *Falkia*.
- Ovary not deeply lobed; fruit not split into 2 or 4 lobes; style simple or, if styles 2, terminal; plants of various habit:
- Styles 2, free or more or less united at the base:
- Styles forked; stigmas 4, linear or subclavate..... 4. *Evolvulus*.
- Styles not forked; stigmas 2, peltate or capitate:
- Sepals (in S. African species) broadly ovate to lanceolate, more or less acute, hairy..... 5. *Seddera*.
- Sepals (in only S. African species) broadly ovate-spathulate to suborbicular, glabrous with membranous and sometimes (partly) ciliolate margins..... 6. *Bonamia*.
- Style 1; stigmas globose to linear:
- Pollen smooth or with folds or thickened ridges, but not spinose:
- Stigmas filiform, terete or subclavate:
- Bracteoles small or narrow, usually more or less remote from the calyx..... 7. *Convolvulus*.
- Bracteoles large, more or less enclosing the calyx as an involucre..... 8. *Calystegia*.
- Stigmas globose, ovate, oblong or elliptic:
- Ovary 1-celled; stigmas ovate, complanate above; sepals unequal, outer ones broadly ovate, 2 inner ones much narrower, lanceolate; corolla (in S. African plants) white or cream with purple "eye"..... 9. *Hewittia*.
- Ovary 2(-4)-celled:
- Flowers (in S. African species) in pedunculate, subglobose heads, usually blue; leaves cordate at the base, entire or slightly lobed... 10. *Jacquemontia*.
- Flowers (at least in S. African species) not in heads, but in cymes or dichasia, or solitary, white or yellow, often with dark centre; leaves usually palmately or pinnately lobed or dissected, sometimes auricled at the base, rarely entire:
- Fruit a 4-valved capsule or shedding the 4-valved pericarp *as a whole* by basal circumscission 11. *Merremia*.
- Fruit, when ripe, shedding *the outer layer* of the pericarp (by basal circumscission) as an "operculum", leaving the membranous inner layer of the pericarp which later more or less irregularly splits into strips (Doubtful record, included in key to the species of *Merremia*)..... 12. *Operculina*.

Pollen spinose (Echinoconiae):

- Plants erect, suffruticose or shrubby, sometimes trailing, with rather large leaves, covered in all vegetative parts and on peduncles, pedicels, bracts and calyces with *stellate hairs* (often tomentose); stigmas oblong, thick, fruit dehiscent, 4-valved..... 13. *Astripomoea*.
- Plants of various habit, but, if hairy, not with *stellate hairs*, stigma biglobose or 3-lobed:
- Fruit* a dehiscent capsule; pericarp almost invariably completely separating into 4 valves; leaves without minute black glands on lower surface..... 14. *Ipomoea*.
- Fruit* completely enclosed by the much enlarged calyx, globose, with transversely winged and somewhat thickened persistent dissipiments and a thin wall between these winged portions which ultimately becomes more or less irregularly detached from the wings, exposing the seeds and thus the fruit becoming lantern-shaped with 4 openings through which the seeds are visible..... 15. *Stictocardia*.
- Fruit* indehiscent, often 1-seeded, with erect or more or less spreading sepals which usually do not enclose the capsule; pericarp woody or leathery 16. *Turbina*.

1. CUSCUTA

L. [Sp. Pl. Ed. 1 (1753), p. 124]; Gen. Pl. Ed. 5 (1754), p. 60; T. G. Yuncker, "The Genus *Cuscuta*", Mem. Torrey Bot. Cl. 18, no. 2 (1932); Phillips, Gen. S. Afr. Flow. Pl. Ed. 2 (1951) p. 620; Verdcourt in E. Afr. Agric. Jl. 18, No. 2 (1952), p. 85-86.

Parasitic, usually glabrous herbs, without chlorophyll, annual or rarely perennial in the tissues of the host. *Stems* usually terete and slender to filiform, often whitish, yellowish or reddish, twining or rambling, attached to the host by means of numerous haustoria. *Leaves* reduced to minute scales or none. *Flowers* small, in cymose clusters, sometimes paniculate, generally 5-merous but sometimes 4- or 3-merous. *Calyx* 5-lobed, 5-parted or sepals free; calyx-lobes or sepals broad or narrow, rounded or obtuse to very acute. *Corolla* with a tubular, urceolate, campanulate or semi-globose tube; the lobes shorter or longer than the tube, often patent to reflexed; the tube inside usually with crenulate or fimbriate episepalous membranous scales, rarely scales reduced to crenulate rims or absent. *Stamens* inserted on the corolla above the scales; filaments often short; anthers often broadly elliptic; pollen smooth. *Ovary* 2-celled, 4-ovuled; styles 2, distinct, or connate and style 1; stigmas capitate or elongated. *Fruit* an ovoid or subglobose capsule, opening irregularly, or circumscissile near the base, or indehiscent. *Seeds* 4 or less, almost invariably glabrous; embryo acotyledonous, straight, filiform, enlarged at one end.

Type Species: *Cuscuta europaea* L. Cosmopolitan, the majority of the species American.

Yuncker recognises 158 species in his monograph, but in the opinion of the present writer and also of Dr. B. Verdcourt, Yuncker's conception of specific differences is rather narrow, and we would recognise about 140.

Several species attack economically important crops such as clover, lucerne (= alfalfa), flax, etc., and have become or threaten to become cosmopolitan weeds, e.g., *C. campestris*, *C. suaveolens*, *C. epithimum*, all three now occurring in S. Africa.

Although the flowers in Convolvulaceae are generally 5-merous in calyx, corolla and androeceum (except in *Hildebrandtia*), those of *Cuscuta* are not infrequently 4- or occasionally 3-merous, some species normally having 4-merous flowers.

* If in doubt, or if fruits are lacking, consult the key to the species of *Ipomoea*.

Some authors recognise a separate family *Cuscutaceae* for this genus, but apart from the parasitic habit there is not one character to be found in the structure of the flowers, fruits or seeds which would justify this separation.

Styles united almost to the apex..... 8. *C. cassyoides*.

Styles 2, free to the base or nearly so:

Stigmas capitate-globose or more or less peltate:

Stigmas (in dried specimens) more or less peltate with convolute edges; styles shorter than the ovary; intrastylar aperture of capsule large; flowers 4-5 mm. long and broad; calyx- and corolla-lobes broad, obtuse or rounded; N. Transvaal, Port. E. Africa, in forests on shrubs.....

6. *C. kilimanjari*.

Stigmas usually globose, more rarely somewhat flattened:

Fringed scales in corolla-tube below the stamens present (scales very rarely subentire):

Scales in corolla-tube bifid at the apex:

Flowers normally 5-merous, subsessile, in globose clusters; corolla-lobes ovate to suborbicular, usually shorter than the tube; scales \pm bilobed at the apex, usually not reaching the base of the free portion of the filament; Transvaal and throughout tropical Africa.....

1. *C. australis*.

Flowers usually 4-merous, pedicellate, in \pm umbellate cymes; corolla-lobes narrow, usually distinctly longer than the tube; scales bifurcate, the terminal lobes exerted beyond the sinuses of the corolla-tube, deeply fringed; Cape Province (endemic)...

2. *C. bifurcata*.

Scales in corolla-tube free, not bifid at the apex:

Scales mostly reaching the base of the free part of the filaments, or, if not reaching the filaments, lobes of calyx and corolla very obtuse:

Flowers in usually dense clusters, usually sessile or nearly so, wider than long or about as wide as long, \pm rounded at the base; calyx nearly enclosing the corolla-tube, not very loosely about the base and without wartlike or saccate basal processes; styles shorter than or nearly equalling the ovary:

Scales not reaching the base of the filaments, oblong, variously fimbriated to almost entire; corolla-lobes broad, obtuse or rounded; ovate to suborbicular, erect; Transvaal and wide-spread in tropical and N.E. subtropical Africa, mostly on marsh plants.....

1. *C. australis*.

Scales usually reaching the base of the filaments, ovate, abundantly fringed with fairly long processes, corolla-lobes broadly triangular, acute with often inflexed tips, rarely obtuse, usually spreading; very common and wide-spread, often as a pest on lucerne and other cultivated plants.....

3. *C. campestris*.

Flowers in loose paniculate cymose clusters, pedicellate, slightly longer than wide; pedicels not infrequently longer than the flowers, often papillose and rather rough; calyx shorter than the corolla-tube; (in older flowers at least), usually very loose about the base of the corolla to almost spreading, with wart-like or saccate processes at the base; styles usually longer than the ovary.....

5. *C. appendiculata*.

- Scales usually not reaching the base of the free part of the filaments; lobes of calyx and corolla (sub-) acute; calyx narrowed at the base, without warts or processes at the base, corolla-tube campanulate, longer than wide.....
- Scales in corolla-tube adnate as far as the apex and consisting of two fringed ridges attached on either side of the adnate portion of the filament, or rarely in some of the flowers free at the apex (this variety as yet not recorded from the Union, but may be looked for)..
- No fringed scales in corolla-tube below the stamens.....
- Stigmas conical to clavate or filiform, usually much longer than wide:
- Calyx as long as the corolla-tube, protruding at the sinuses between the calyx-lobes to form prominent wings, 5-angled.....
- Calyx not 5-angled by protruding wings:
- Flowers 5-merous, or if 4-merous, corolla-lobes obtuse or style not very short:
- Stigmas and often also the styles shorter than the ovary (if stigmas about as long as the ovary, styles longer than the stigmas); stigma usually considerably shorter than the style:
- Corolla-lobes with cucullate apices; flowers \pm 2 mm. long; stigmas conical, sausage-shaped to sub-clavate, much shorter than the styles.....
- Corolla-lobes often with inflexed or reflexed tips, but never cucullate; flowers more than 2 mm. long; stigmas various:
- Lobes of calyx and corolla acute; flowers pedicellate; styles as long as or longer than the ovary:
- Calyx usually distinctly shorter than the corolla-tube; if calyx about as long as the corolla-tube, stigmas considerably shorter than the styles:
- Flowers usually 3-4 mm. long; corolla-lobes acute or obtuse; scales about reaching the base of the filaments; styles distinctly longer than the stigmas.....
- Flowers 4-7 mm. long; corolla-lobes very acute, often with reflexed tips; scales not reaching the base of the filaments; styles about as long as the stigmas...
- Calyx about as long as the corolla-tube. Stigma about as long as the style.....
- Lobes of calyx and corolla obtuse; flowers sessile, in few-flowered dense clusters; styles shorter than the ovary.....
- Both stigmas and styles longer than the ovary. Stigma filiform, as long as or longer than the style:
- Calyx considerably shorter than the corolla-tube; stems medium; flowers pale, whitish, pedicellate, 4-7 mm. long.....
- Calyx not considerably shorter than the corolla-tube (in some forms of *C. epithymum* calyx distinctly shorter than the corolla-tube, but if so, stems very slender, capillary, and flowers \pm 3 mm. long, sessile in dense globose clusters, often reddish):
- Flowers somewhat fleshy, 3-5 mm. long, in loose cymose clusters; scales usually reaching the bases of the filaments; stems medium; S.W. Cape districts, on wild plants.....
4. *C. suaveolens.*
7. *C. hyalina* var. *nubiana.*
7. *C. hyalina.*
13. *C. angulata.*
9. *C. gerrardii.*
10. *C. africana.*
11. *C. natalensis.*
12. *C. nitida.*
14. *C. planiflora* var. *madagascarensis.*
11. *C. natalensis.*
12. *C. nitida.*

Flowers more herbaceous, \pm 3 mm. long, sessile, in dense, compact, globose clusters; scales usually not reaching the base of the filaments; stems very slender, capillary; wide-spread, on wild and cultivated plants.....

15. *C. epithymum*.

Flowers 4-merous in small, dense, sessile globose clusters. Corolla-lobes erect, acute; stigmas longer than the very short styles; scales in corolla-tube entire or bifid, the fringes distinctly thickened at their apices.....

14. *C. planiflora* var. *mossamedensis*.

1. *C. australis* R. Br., Prodr. Fl. Nov. Holl. Ed. 1 (1810) p. 491; Yuncker, op. cit., p. 124, fig. 1: Ooststr. in Blumea 3 (1938), p. 66; Verdcourt in E. Afr. Agric. Jl. 18, no. 2 (1952), p. 85-86; Ooststr. in Steenis, Fl. Males Ser. 1. 4.4 (1953), p. 392. *C. cordofana* (Engelm.) Yuncker, op. cit., p. 127, fig. 2. ?*C. obtusiflora* H.B. et K., Nov. Gen. Spec. Pl. 3 (1818), p. 122 (= p. 96 of folio edition).

Type: *Caley* in herb. R. Brown from "New Holland" (K). Isotype in the herbarium of the Missouri Botanical Garden (fide Yuncker, who erroneously called this specimen the type).

Flowers often somewhat glandular, 2-3 mm. long, subsessile in dense subglobose clusters. *Calyx* about as long as the corolla-tube, lobes broad, ovate to suborbicular, rounded at the apex. *Corolla* campanulate; its lobes shorter than or as long as the tube, erect to somewhat spreading, broad, rounded at the apex. *Stamens* shorter than the corolla-lobes; filaments usually stout, more or less subulate and often shorter than (sometimes about as long as) the broadly elliptic to suborbicular anthers. *Scales* oblong, shorter than the tube, bifid or bilobed to entire, variously fimbriated. *Ovary* globose; styles shorter than the ovary, intrastylar aperture large. *Capsule* globose or somewhat obovoid, not dehiscent by circumscission. *Seeds* ellipsoid to ovoid, 1.5-2 mm. long.

Yuncker mentions under *C. australis*: "Turkestan to Japan and to Australia" and under *C. cordofana*: "throughout central Africa to Madagascar". If, what is not unlikely, *C. obtusiflora* H.B. & K. is also conspecific or at most worthy only of varietal rank, the range of *C. australis* would include South America. It extends into the Transvaal and Portuguese East Africa.

TRANSVAAL.—Potgietersrust, Naboomspruit: Galpin 11622 (PRE, BOL).

Hosts.—Yuncker, Van Ooststroom and Verdcourt mention *Hydrocotyle*, *Polygonum* and several other plants. Verdcourt reports: "often found on marsh plants". The specimens cited above were collected "in swampy places" on *Polygonum tomentosum* and *Jussiaea fluitans*.

The reduction of *C. cordofana* to *C. australis* is done here in agreement with Verdcourt's above-cited preliminary treatment of the genus *Cuscuta* which is a summary of his unpublished account for the Flora of Tropical East Africa.

The flowers are normally 5-merous, but 4-merous ones are not rare.

A specimen leg. Bradfield from Benoni, Transvaal (PRE) which I tentatively refer to this species has only 3- and 4-merous flowers. Abnormality is indicated by the fact that a trimerous flower had 3 anthers on one filament making 5 anthers in all suggesting the normal 5-merous flowers. This specimen was studied by Dr. Yuncker and by Dr. Verdcourt and both agree upon its close relation to *C. australis*. Dr. Yuncker thought it might represent an undescribed species. Dr. Verdcourt suggested that the specimen is an abnormal form of *C. australis*. As it is sometimes difficult to distinguish between *C. australis* and the cosmopolitan weed *C. campestris*, the

abnormal specimen might even belong to the latter. The plant was collected on a *Pelargonium*, probably in a garden, and this would point to *C. campestris* rather than *C. australis*.

2. *C. bifurcata* Yuncker, op. cit., p. 131, fig. 7.

Type: *Paterson 578*, from Port Elizabeth (K).

Flowers 2–2.5 mm. long, glandular, usually 4-merous, in few-flowered umbellate cymes on short pedicels. *Calyx* about equalling the corolla-tube, its lobes oblong to lanceolate, obtuse or sub-obtuse with rounded sinuses between them. *Corolla* divided halfway down or slightly more; the tube broadly campanulate; the lobes acute or subacute to obtuse, erect to spreading, lanceolate-oblong. *Stamens* shorter than the corolla-lobes or subequalling them; anther shorter than the filaments. *Scales* bifurcate at the apex, adnate to the sinus between the apical lobes, the latter exerted between the corolla-lobes. Ovary globose, styles slender, shorter than or nearly equalling the ovary. Fruit depressed-globose, not dehiscent by circumscission. *Seeds* about 2 mm. long, subglobose, flattened on two sides, slightly attenuate on one end; hilum short, oblong, oblique.

Endemic.

CAPE PROVINCE.—Ceres, Kouebokkeveld: *Schlechter 10110* (BOL, GRA, PRE). Port Elizabeth: *Paterson 578* (GRA, PRE, isotypes).

Hosts.—The type collected on *Falkia repens* (Convolvulaceae); *Schlechter's* specimens on *Ursinia* (Compositae).

3. *C. campestris* Yuncker, op. cit., p. 138, fig. 14; Ooststr. in *Blumea* 3 (1938), p. 68; Verdcourt in *E. Afr. Agric. J.* 18, no. 2 (1952), p. 85–86.

Type: From Texas (fide Yuncker).

Flowers 2–3 mm. long, occasionally longer, often glandular, subsessile or on short pedicels in compact, globose clusters. *Calyx* enclosing the corolla-tube or nearly so, broadly campanulate; its lobes ovate to orbicular or broadly triangular, usually obtuse to rounded. *Corolla-tube* campanulate; the lobes broadly triangular to ovate, spreading, with often inflexed tips, usually acute. *Stamens* shorter than the corolla-lobes; filaments longer than or equalling the anthers. *Scales* ovate, elliptic or obovate, often exerted between the corolla-lobes, free at the apex, usually abundantly fringed. *Ovary* globose; styles often somewhat unequal, slender, becoming thicker and conspicuous in fruit. *Capsule* depressed-globose with a depression around the style-bases, 2–2.5 mm. high and 3–4 mm. in diam., not circumscissile. *Seeds* about 1.5 mm. long, usually flattened on one side; hilum terminal, oblong, transverse.

A native of America and introduced into Europe, S. and E. Africa, E. Asia, Australia and Polynesia. Recorded widely in the Union of South Africa but as yet not from South West Africa, on a wide range of hosts.

The oldest records in the Union are from 1907 so that it is likely that this plant was introduced in 1907 or shortly before that date.

4. *C. suaveolens* Ser. in *Ann. Sci. Phys. Nat. Agric. Indust.* 3 (1840), p. 519; Yuncker, op. cit., p. 148, fig. 22. *C. medicaginis* C. H. Wright in *Dyer, Fl. Cap.* 4,2: 86 (1904).

Type: A specimen from Lyon, France (fide Yuncker).

Flowers in racemose clusters on short pedicels, more or less glandular, membranous when dry, 3–4 mm. long. *Calyx* shorter than the corolla-tube, lobed about halfway down; its lobes ovate-triangular, more or less acute often with revolute edges, separated by usually rounded sinuses. *Corolla* long-campanulate to funnel-shaped; the lobes ovate-triangular, with acute, inflexed tips, about $\frac{1}{2}$ to $\frac{3}{4}$ as long as the tube. *Stamens* shorter than the corolla-tube; filaments about as long as the anthers. *Scales* usually not reaching the stamens, oblong to ovate or triangular-ovate, free at the apex, fringed with rather short processes. *Ovary* globose; styles slender, often distinctly unequal, about as long as the ovary. *Capsule* globose, not circumscissile. *Seeds* 4 to 2, 1.5–2 mm. long, subglobose; hilum oblong, longitudinal.

Originally a native of South America but, as a contaminant of *Medicago sativa*, wide-spread and now almost cosmopolitan.

CAPE PROVINCE.—Somerset East, Pearston: *Div. Council* 16982 (PRE). Grahams-town: *Blomfield* s.n. (GRA). Queenstown: *Galpin* 1760 (PRE, GRA, isotypes of *C. medicaginis* C. H. Wright), *Galpin* 7781 (PRE, GRA). “Fish River”: *White* 485 (GRA).

TRANSVAAL.—Johannesburg: *Ratray* 830 (PRE). Belfast, Machadodorp: *N.N.* in Govt. Herb. no. 6302 (PRE).

Hosts.—On a variety of plants but in S. Africa almost exclusively on lucerne.

5. *C. appendiculata* *Engelm.* in *Trans. Acad. Sci. St. Louis* 1 (1859), p. 503; Baker & Wright in *Dyer, Fl. Cap.* 4, 2 (1904), p. 86; Yuncker, *op. cit.*, p. 152, fig. 26, incl. var. *macroflora* Yuncker; Salter in *Adams. & Salt., Fl. Cape Penins.* (1950), p. 687.

Type: *Krauss* 1816 from Swellendam, C.P. (Not seen.)

Flowers in loose, paniculate, cymose clusters, 1.5–4 mm. long, more or less glandular particularly the calyx. *Pedicels* shorter to longer than the flowers, papillose or verrucose. *Bracteoles* often papillose-verrucose and saccate at the base by wart-like projections. *Calyx* shorter than the corolla-tube; its tube verrucose towards the base and with wart-like basal processes; the lobes triangular, acute. *Corolla* campanulate; the erect to spreading lobes nearly as long as the tube, oblong- or ovate-lanceolate, acute to acuminate, with inflexed tips. *Stamens* shorter than the corolla-lobes; filaments about as long as the anthers. *Scales* oblong-ovate or obovate, much fimbriate, about equalling the corolla-tube. *Ovary* globose; styles slender, equalling the ovary or slightly longer, often somewhat unequal. *Capsule* ovoid or globose, somewhat contracted and roughened around the style-bases, not circumscissile. *Seeds* subglobose, somewhat flattened, about 1.5 mm. long; hilum oblong, longitudinal.

Endemic.

CAPE PROVINCE.—Cape Flats: *Andreae* 397 (PRE). Near Cape Town: *Moss* 9305 (J). Fraserburg: *Pons* s.n. (PRE). Oudtshoorn: *Schoeman* s.n. (PRE). Riversdale: *Burgers* s.n. (PRE); *Muir* in BOL H. no. 25024. Mossel Bay, Bankfontein: *Muir* 1281 (PRE). Uniondale: *Fourcade* 2087 (BOL). Humansdorp: *Fourcade* 5171 (BOL). Zitzikamma: *Schlechter* 5973 (BOL, GRA, PRE). Somerset East: *MacOwan* in BOL H. no. 25023, 1958 (SAM). Bedford: *Bennie* 250 (GRA, type of var. *macroflora* Yunck). Victoria East: *Ratray* 17 (GRA). King William's Town, Green River: *Flanagan* 1707 (BOL, GRA, PRE). Transkei: *Barber* 32 (GRA, PRE). Kimberley: *Hutton* in herb. McOwan & Bolus 923 (BOL, GRA, SAM); *McOwan* 2915 (NH, PRE); *Flanagan* 1421 (BOL, PRE); *Moran* 496a (KMG).

TRANSVAAL.—Middelburg, Klein Olifants River: *Schlechter* 3811 (BOL, GRA, NH, PRE).

Hosts.—*Lycium*, *Nicotiana glauca*, *Hermannia*, *Combretum*, *Pelargonium*, *Falkia*, *Compositae*, *Campanulaceae*, *Sporobolus pungens*, *Thesium* sp.

Yuncker distinguishes a var. *macroflora* Yuncker with larger flowers than the typical form, but admits that "some of the specimens are intermediate in their characters connecting this variety with typical *C. appendiculata*".

6. *C. kilimanjari* Oliv. in Johnston, Kilimanjaro Exped., Append., p. 343 (1886), nomen tantum, and in Trans. Linn. Soc., 2nd Ser., Bot. (1887), p. 343, descr.; Baker, & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1906), p. 205; Yuncker, op. cit., p. 187, fig. 58; Verdcourt in E. Afr. Agri. J. 18, no. 2 (1952), p. 85-86; Brenan in Mem. New York Bot. Garden 9 (1954), p. 9.

Type specimen: Johnston 86 (K).

Stems of medium thickness to rather stout. *Flowers* in few-flowered cymes on pedicels shorter than the flowers, 4-5 mm. long and in diam., somewhat coriaceous when dried. *Calyx* cupulate, its lobes ovate-orbicular, obtuse, overlapping at the base, rather thick and often more or less carinate. *Corolla* campanulate-cylindric, the tube longer than the ovate-orbicular, obtuse to rounded and often somewhat revolute lobes. *Stamens* shorter than the corolla-lobes, filaments as long as or slightly longer than the anthers. *Scales* triangular or oblong, the apex often truncate, irregularly and unevenly fringed to almost entire along the edge, usually reaching the bases of the stamens, but sometimes smaller or reduced. *Ovary* globose; stigmas shorter than the ovary; stigmas often flattened with convolute edges. *Capsule* globose, intrastylar aperture large; irregularly circumscissile near the base. *Seeds* 2-4, ovoid, 1.5-3 mm. long, somewhat attenuated at the base; hilum oblong.

From Abyssinia to Portuguese E. Africa and N. Transvaal, as a rule at altitudes above 1,000 metres (3,000 ft.), in forests.

TRANSVAAL.—Pietersburg, Magoeba's Kloof: Wager s.n. (PRE); Doidge s.n. (PRE); Taylor 758 (PRE).

Hosts: Various, mainly shrubby. (*Plectranthus*, *Podranea* and, according to Verdcourt, often on Acanthaceae).

Verdcourt has pointed out that Oliver's original description is inaccurate in that he reported the absence of epistamineal scales so that this species keys out to "*C. obtusiflora*" in the Flora of Tropical Africa, and indeed many specimens were found in the herbaria under the latter name.

7. *C. hyalina* Roth, Nov. Pl. Spec. (1821), p. 100, Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1906), p. 205; Yuncker, op. cit., p. 235, fig. 107; Verdcourt in E. Afr. Agr. J. 18 (1952), No. 2, p. 85-86. *C. epitribulum* Schinz in Bull. Herb. Boiss. 2me sér., 1 (1901), p. 880; Baker & Rendle, op. cit., p. 236.

Type: Heyne (India).

Flowers 2.5-3.5 mm. long, in umbellate cymes on short pedicels, thin in texture, 5- or sometimes 4-merous, shining and yellowish when dry. *Calyx* campanulate-turbinate, the triangular or ovate-lanceolate lobes very acute to acuminate, longer than or about as long as the tube, erect to reflexed. *Stamens* shorter than the corolla-lobes, anthers as long as or shorter than the filaments. *Scales* none. *Ovary* globose; styles slender, as long as or longer than the ovary, somewhat unequal. *Capsule* globose, irregularly circumscissile near the base. *Seeds* ovoid, about 1.5 mm. long, hilum short.

India to Abyssinia, Sudan, and drier areas of Southern Africa.

S.W. AFRICA.—Okahandja: *Dinter* 1338 (SAM); 4500 (PRE); *Bradfield* 344 (PRE). Windhoek: *Bosch* H. No. 25022 (BOL).

CAPE PROVINCE.—Prieska: *Bryant* 357, H. no. 3038 (PRE).

8. *C. cassytoides* *Nees ab E.* in *Linnaea* 20 (1847), p. 196, nomen tantum; ex Engelm. in *Trans. Acad. Sci. St. Louis* 1 (1859), p. 513; Baker & Wright in *Dyer, Fl. Cap.* 4, 2 (1904), p. 86; Baker & Rendle in *Dyer, Fl. Trop. Afr.* 4, 2 (1906), p. 206; Wood, *Natal Pl.* 6 (1912), t. 534; Yuncker, op. cit., p. 250, fig. 123; Verdcourt in *E. Afr. Agric. J.* 18, No. 2 (1952), p. 85–86. *C. timorensis* Decne. ex Engelm., *Trans. Acad. Sci. St. Louis* 1 (1859), p. 514; Yuncker, op. cit., p. 250, fig. 124; Ooststr. in *Blumea* 3 (1938), p. 69 and in Steenis, *Fl. Males. Ser. I*, 4·4 (1953), p. 393

Type: *Drège* 8307 (the specimen in the herb. Missouri Botanical Garden).

Stems coarse, up to 2 mm. in diam. and over. *Flowers* nearly sessile, 2·5–4 mm. long, arranged in few-flowered clusters in paniculate spikes, or inflorescence reduced to a single short raceme. *Calyx* cupulate, the lobes broadly ovate to orbicular, broadly rounded, overlapping, with more or less unequal edges. *Corolla* campanulate; its lobes as long as the tube, ovate, obtuse to rounded, erect to reflexed. *Stamens* subsessile, filaments much shorter than the anthers. *Scales* triangular or shorter, truncate or represented by pairs of narrow wings, shallowly and irregularly fimbriate to almost entire, free at or adnate to the apex. *Ovary* ovoid-conical or globose-conical; style longer than the depressed, small stigmas. *Capsule* globose-ovoid to ovoid-oblong, circumscissile near the base, 5–8 mm. long. *Seeds* often less than 4, about 3 mm. long, hilum long, narrow, terminal.

S. Africa (from Swellendam into Natal and the Transvaal) to E. Africa, Java and Lesser Sunda Islands.

CAPE PROVINCE.—Swellendam, Grootvadersbosch: *Ecklon & Zeyher* 22 (PRE). Knysna: *Doidge* s.n. (PRE). Uitenhage: *Drège* 8037 (L, is type!). Humansdorp, Zitzikamma: *Fourcade* 677 (BOL, GRA). Somerset East, Boschberg: *Burchell* 3178 (PRE); *MacOwan* 1959 (US). Albany, Grahamstown: *Schlechter* 2755 (GRA); *Galpin* 16 (GRA, PRE); Howieson's Poort: *Zeyher* 363 (PRE); Goldspring: *Glass* 350 (PRE). Keiskamma Hoek: *Britten* 2887 (GRA). Stutterheim, Dohne Hill: *Sim* 2480 (NU). King William's Town: *Ranger* 134 (PRE). Peddie: *Sim* 2479 (NU). Kentani: *Pegler* 494 (BOL, PRE). Komgha: *Flanagan* 1285 (BOL, PRE, SAM). Willowvale, Qoha Mouth: *Meeuse* (PRE).

NATAL.—Durban, near Durban: *Wood* s.n. (GRA, SAM); *Wood* 11075 (NH); *Franks* in herb. Wood No. 11704 (NH); *Lansdell* 1197 (PRE). Pietermaritzburg: *Killick* 336 (PRE). Weenen: *Thomasset* s.n. (PRE). Paul Pietersburg: *Acocks* 11601 (NH, PRE).

TRANSVAAL.—Barberton: *Thorncroft* 794 (NH); *Galpin* 949 (BOL, GRA, NH, PRE).

Hosts.—Parasitic on many woody plants such as *Grewia*, *Trema*, *Ficus*, in forests, and thickets.

Yuncker and Van Ooststroom remarked on the close relationship between *C. cassytoides* and *C. timorensis* and Verdcourt, who has studied both types, came to the conclusion that they are conspecific with which view I agree.

C. cassytoides has page priority (apart from the fact that the name was published by Nees in 1847, as a nomen nudum it is true, whereas *C. timorensis* was only published in 1859, when Engelmann took up Decaisne's manuscript name) and the name *C. cassytoides* N. ab E. ex Engelm. must be adopted.

9. *C. gerrardii* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 84; Yuncker, op. cit., p. 264, fig. 133. *C. cucullata* Yuncker, op. cit. (1932), p. 263, fig. 132.

Type: *Gerrard* 1337, Zululand (K).

Stems slender to medium. *Flowers* \pm 2 mm. long, in loose clusters, more or less glandular, on short pedicels. *Calyx* shorter than the corolla-tube or about as long, more or less thickened at the basal part, its lobes ovate, obtuse or almost acute, often loose about the corolla. *Corolla-tube* campanulate; the lobes erect to slightly spreading, ovate to more or less triangular, acute, inflexed with cucullate tips, about as long as, or longer, than the tube. *Stamens* slightly shorter than the corolla-lobes; filaments somewhat subulate, longer than or about as long as the oval anthers. *Scales* oblong or ovate, usually truncate or rounded at the apex, not deeply fimbriate; adnate below the middle. *Ovary* globose, more or less depressed and slightly but distinctly attenuated into a short thickened base; styles shorter to slightly longer than the ovary, often divergent; stigmas conical or sausage-shaped to oblong, much shorter than the styles. *Capsule* globose or depressed-globose, not circumscissile; styles divergent, intrastylar opening large. *Seeds* (in the mature capsules studied) 1–2, black, finely tuberculate or rugose; hilum small, inconspicuous, nearly basal.

NATAL.—Eshowe: *Lawn* 1535 (NH). Entumeni: *Wylie* in herb. Wood No. 8761 (NH, PRE); *Haygarth* H. No. 12988 (NH, PRE). “Zululand”: *Gerrard & McKen* 1337 (NH, isotype!). Umzinto, Dumisa: *Rudatis* 827 (PRE, isotype of *C. cucullata* Yunck.).

Hosts: several unidentified herbs and shrublets.

The original descriptions of *C. gerrardii* and of *C. cucullata* were based on single specimens and an amended description is given above.

The non-circumscissile capsule places *C. gerrardii* in Yuncker's subsection *Cucullatae* of the section *Pachystigma* and not in subsection *Africanae*.

10. *C. africana* Willd., Sp. Pl. (1797), p. 703; Thunb. in Hoffm. Phyt. Blätt. (1803), p. 17, and Fl. Cap. Ed. Schult. (1823), p. 568; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 85, incl. var. *capensis* Baker; Marloth, Fl. S. Afr. 3 (1932), p. 108; Yuncker, op. cit., p. 264, fig. 134. *C. capensis* Choisy in DC. Prodr. 9 (1845), p. 454. *C. alpestris* Fourcade in Trans. Roy. Soc. S. Afr. 21 (1932), p. 89.

Type: Yuncker, in his monograph, does not mention Willdenow as the author of the name *C. africana*, although he is correctly credited as such by Thunberg and in the Index Kewensis. Willdenow's description is poor but he quotes *Cuscuta americana* Thunb. Prodr. 32 (non L.) as a synonym. *Cuscuta americana* Thunb. is undoubtedly *C. africana* and represented by a specimen in Herb. Thunberg [*vide* Juel, Plantae Thunbergianae (1918), p. 385]. Moreover, the only specimen in the Willdenow herb. (no. 3161) that is quoted by Yuncker in the subsection *Africanae* of the section *Pachystigma* belongs to *C. africana*. This specimen (Willdenow H. No. 3161), identified by Yuncker, is in my opinion the type of *Cuscuta africana*, and accordingly, the name should be quoted as “*C. africana* Willd.” (1797) and not as “*C. africana* Thunb.” (1803 or 1813). As it is highly probable that Willdenow received his specimen from Thunberg, the specimen in the Thunberg herbarium at Uppsala can be taken to represent an isotype. Willdenow, and others, have pointed out that this plant was probably part of Linnaeus's species *Schrebera schinoides* [Sp. Pl. Ed. 2 (1763), p. 1662], which includes parts of the host plant, *Myrica aethiopica* L. (= *M. conifera* Burm. f.). However, as Yuncker (op. cit., p. 265) pointed out, Linnaeus's figure and description are not sufficient to recognise the species and the plant is not represented in the Linnaean herbarium. This and the fact that the description of *Schrebera schinoides* L. contains

part of the host, made Yuncker hesitate to substitute Linnaeus's specific epithet for the universally applied name *africana*. I am also of the opinion that *Schrebera schinoides*, being a *nomen confusum* (see Green in Kew Bull. 1935, p. 482) is to be rejected according to Art. 64 of the Rules.

Stems medium. *Flowers* on pedicels shorter to longer than the flowers in loose to compact clusters. *Calyx* usually distinctly shorter than the corolla-tube; lobes triangular-ovate, obtuse to subacute. *Corolla* campanulate-funnelshaped, the lobes triangular, spreading or reflexed, sometimes suberect, acute or obtuse, usually about as long as the tube. *Stamens* shorter than the lobes, filaments longer than the anthers. *Scales* about reaching the stamens or longer, oblong with rather small fringes, free at the apex. *Ovary* globose; styles slender, longer than the ovary and also longer than the thickened oblong-cylindrical stigmas. *Capsule* globose, irregularly circumscissile near the base. *Seeds* subglobose; hilum terminal, narrow.

CAPE PROVINCE.—Rivier Sonder End (District not quite certain): *Thorne* H. No. 45784 (SAM). Swellendam, Grootvadersbosch: *Zeyher* 3447 (PRE, SAM); Tradouw Mts.: *Marloth* 8644 (PRE). Riversdale, Langebergen: *Schlechter* 1842 (US), 5780 (GRA); *Muir* 156 in herb. Galpin No. 5155 (BOL, GRA, PRE). George, Kaymans Gat: *Drège* 7833 (L, PRE, isotypes of *C. capensis*); "Georgetown": *Hops* H. No. 25021 (BOL); Outeniquas: *Esterhuysen* 19396 (BOL); Montagu Pass: *Fourcade* 6495 (BOL); nr. Touws River: *Burchell* 5730 (BOL, L); George: *Schlechter* 5780 (GRA); *Esterhuysen* 10858 (BOL); *Fourcade* 3469, 5307 (BOL). Knysna: *Phillips* 154 (GRA); *Keet* 1009 (BOL, GRA, PRE); *McNaughton* H. No. 18609 (SAM); *Fourcade* 1508 (BOL, GRA), 5307 (BOL); *Barker* 6032 (BOL, NBG). Uniondale, Joubertina: *Esterhuysen* 7075 (BOL), 10699 (BOL); Compton 4490 (BOL); Kammanassie Berg: *Esterhuysen* 4740a, *Zinn* H. No. 5411 (SAM); Headwaters of Wagenboom River: *Fourcade* 2389 (type of *C. alpestris* Fourcade, BOL); *Zitzikamma*, E. of Klein Bosch River: *Fourcade* 339 (BOL, GRA). Humansdorp, Rietvlei: *Esterhuysen* 6651 (BOL, PRE); Kromme Rivier: *Bolus* 2406 (BOL). Uitenhage, Van Staadens Mts.: *Paterson* 892 (GRA); *Hutchinson* 1497 (BOL); *Long* 396 (PRE); nr. sources of Bulk River: *McOwan* 1933 (SAM).

The numbers *Wolley Dod* 859 from the Cape Peninsula and *Schlechter* 9043 (not 9093, as erroneously cited by Yuncker, op. cit., p. 267) from Tulbagh, both quoted under *C. africana* in *Flora Capensis*, are *C. nitida*.

Hosts: Mainly on woody plants such as *Laurophyllus capensis* Thunb., *Myrica*, *Berzelia*, *Phyllica*, *Protea*, *Geissoloma*, *Virgilia*, *Ursinia*, *Clutia*, etc. According to Marloth, *C. africana* is a perennial which hibernates inside the bark of the hosts [Fl. S. Afr. 3 (1932), p. 108].

11. *C. natalensis* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 85; Yuncker, op. cit., p. 266, fig. 135.

Type: *Wood* 596 from Inanda nr. Durban (Kew), designated by Yuncker.

Stems medium. *Flowers* 4–7 mm. long, in cymose clusters on pedicels shorter than the flowers. *Calyx* much shorter than the corolla-tube, its lobes triangular-ovate, acute to subacute, the tips often spreading. *Corolla* cylindrical-campanulate; the lobes triangular-lanceolate, acute or acuminate, erect to spreading or reflexed, shorter than or nearly as long as the tube. *Stamens* shorter than the corolla-lobes; the filaments about as long as the anthers. *Scales* oblong, nearly reaching the stamens or shorter, fringed with rather short processes, free at the apex. *Ovary* globose; styles slender, about as long as the thickened cylindrical stigmas, both together considerably longer, than the ovary. *Capsule* globose, circumscissile near the base; intrastylar opening large. *Seeds* 1–1.25 mm. long, subglobose; hilum a short oblique line.

CAPE PROVINCE.—Komgha: *Pegler* 911 (PRE, BOL). Kentani: *Pegler* 1508 (SAM, GRA).

NATAL.—Durban, near Durban: *Wood* 596 (BOL, NH, PRE, SAM, isotypes!). Botha's Hill: *Wood* s.n. (GRA, SAM). Pietermaritzburg: *Doidge* s.n. (PRE); *Natal Univ. Students* 8 (NH). Ixopo: *Acocks* 13789 (PRE). Umzinto, Dumisa: *Rudatis* 1666 (PRE, L).

12. *C. nitida* E. Mey. ex. Choisy in Mém. Soc. Phys. Hist. Nat. Genève 9 (1841), p. 272, pl. 2, fig. 1, and in DC. Prodr. 9 (1945), p. 454; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 85; Yuncker, op. cit., p. 266, fig. 136; Salter in Adams. & Salt., Fl. Cape Penins. (1950), p. 687. *C. nitida* E. Mey. ex Drège, Zw. Pflanzeng. Doc. (1843), p. 87, 176, nomen tantum.

Type: "Ad Paarlberg alt. 2000 ped. rep. *Drège!*" (Choisy), in herb. De Candolle (Geneva).

Stems medium. *Flowers* in loose cymose clusters on short pedicels, often somewhat fleshy, granulate and reddish, 3–5 mm. long. *Calyx* campanulate-turbinate, deep; its lobes usually short, triangular, acute, but sometimes longer, lanceolate and if so, longer than the corolla-tube. *Corolla-lobes* spreading or reflexed, lanceolate or triangular-lanceolate, acute, as long as or longer than the tube. *Stamens* shorter than the corolla-lobes; filaments longer than the anthers. *Scales* large, oblong, reaching the stamens, fringed, free at the apex. *Ovary* globose; styles about as long as the oblong-cylindrical thickened stigmas, both usually longer than the ovary. *Capsule* globose, depressed near the style-bases, circumscissile near the base. *Seeds* about 1.5 mm. long, ovoid-oblong or ovoid; hilum small, circular to oblong.

CAPE PROVINCE.—Clanwilliam, Olifants Riv., near Rondegat: *Schlechter* 10789 (BOL, GRA, PRE); Cedarbergen: *Thode* A2170 (NH, PRE), s.n. (NH); *Compton* 4990 (NBG); between Hex River and Kriedouw Krantz: *Pearson* 5248 (BOL). Piquetberg, Elandsberg: *Pillans* 7879 (BOL); Het Kruis: *Stephens & Glover* 8760 (BOL); Piquetberg: *Bolus* 7561 (BOL). Tulbagh, Nieuwe Kloof: *Schlechter* 9043 (BOL, GRA, L, PRE, US; erroneously cited as 9093 by Yuncker and under *C. africana* in Fl. Cap.); Tulbagh Road: *Rogers* 17342 (BOL, J, PRE); St. Helena Bay: *Marloth* 8014 (PRE). Malmesbury, Riebeecks Kasteel: *Drège* (BOL). Paarl, Wemmershoek: *Esterhuysen* 4031 (BOL); *Bond* 728 (NBG); Paarlberg: *Drège* (L, isotype!); Klein Drakenstein: *Drège* (L); *Salter* 5006 (BOL). Worcester, Worcester: *Ecklon & Zeyher* 1·11 (L, BOL, US, GRA); *Zeyher* 20 (SAM); Diep River: *Marloth* 7277; *Marloth* 7449, p.p. Wynberg and Cape Peninsula: *Ecklon & Zeyher* 62·11 (US, L, GRA, PRE); *Zeyher* 1235 (PRE, SAM); *Wolley Dod* 859 (erroneously cited under *C. africana* in Fl. Cap.) (BOL); *Bolus* 4427, 4427a (BOL); *Marloth* 4252, 5616, 12742 (PRE), *Alexander* s.n. (PRE); *Moss* 7522, 9094 (J); *Phillips* 146 (SAM); *Smith* 2908 (PRE); *Guthrie* s.n. = H. No. 16961 (BOL); *Leighton* 376 (BOL); *Young* 207 (PRE); *Salter* 2866 (BOL); *Pillans* 10049 (BOL); *Brain* 6022 (SRGH); *Compton* 15508 (NBG). Stellenbosch: *Meyer* s.n. (PRE); *Smith* 6036 (PRE). Somerset-West, Sir Lowry's Pass: *Schlechter* 7271 (BOL, GRA, L, PRE, SAM, US). Caledon: *McNae* 1097 (SAM).

Hosts: Mostly woody plants such as *Rhus*, *Proteaceae*, *Montinia*, *Aspalathus*, *Passerina*, *Ericaceae*, *Phyllica*, suffruticose *Compositae*, *Pelargonium*, *Oftia* and *Selago*.

The specimen "leg. Drège, Port Natal", cited by Yuncker, must be an error since *C. nitida* does not occur in Natal and most probably a mistake was made during labelling or relabelling.

Marloth's observations on "*C. africana*" being a perennial plant may well apply to *C. nitida*, because in Marloth's herbarium there are several sterile young plants of a *Cuscuta*, growing on woody plants (e.g. *Montinia*) and collected at Camps Bay and Somerset West, where *C. africana* does not occur.

13. *C. angulata* Engelm. in Trans. Acad. Sci. St. Louis 1 (1859), p. 474; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 84; Marloth, Fl. S. Afr. 3 (1932), Pl. 27; Yuncker, op. cit. p. 267, fig. 137; Salter in Adams. & Salter, Fl. Cape Penins. (1950), p. 687.

Type: *Drège* s.n. from Dutoitskloof, Worcester Div. (the specimen in the herb. Missouri Bot. Garden).

Stems slender. *Flowers* 3–4 mm. long, often glandular, on pedicels longer to shorter than the flowers, in loose fasciculate cymes; bracts often numerous on the longer pedicels. *Calyx* as long as and enclosing the corolla-tube, protruding at the sinuses between the lobes to form prominent wings and widest about the middle; the lobes triangular, acute. *Corolla* lobes narrowly triangular to lanceolate, erect to spreading, longer than or equalling the campanulate, more or less angular tube, which is usually angled opposite the protruding wings of the calyx. *Stamens* shorter than the lobes; filaments longer than the anthers. *Scales* oblong-spathulate, fringed with processes of medium length, adnate near the base and free for the greater part of their length. *Ovary* globose or somewhat oblong, styles slender, longer than the ovary, and usually longer than the oblong-cylindrical thickened styles. *Capsule* globose to oblong or pear-shaped, circumscissile near the base. *Seeds* usually solitary, ovoid; hilum terminal.

CAPE PROVINCE.—Cape Flats: *Marloth* 4249 (PRE). Cape Peninsula: *Salter* 8728 (BOL). Hottentots Holland Mts.: *Esterhuysen* 9805 (BOL). Worcester, Dutoitskloof: *Drège* (" *Cuscuta africana* Th. c.", isotypes, in L, PRE). Caledon, Houw Hoek: *Schlechter* 7381 (BOL, GRA, L, PRE, SAM, US); Onrust Riv.: *Schlechter* 9506 (GRA, PRE). Hermanus: *Taylor* 1529 (PRE); *Guthrie* s.n., H. No. 25025 (BOL, PRE); Paardeberg Foothills: *Stokoe* 9214 (BOL, PRE); *Cloete* H. No. 60916 (SAM). Bredasdorp: *Du Toit* s.n. (BOL H. No. 25026); Wolwekloof: *Smith* 5021, 5045 (PRE); Elim: *Bolus* 8580 (BOL, PRE, NH, NGB), *Barker* 7781 (NGB); Potberg (Potteberg): *Pillans* 9490 (BOL, PRE, NGB).

Hosts: Mostly ericoid shrubs: *Staavia*, *Berzelia*, Ericaceae, Proteaceae, *Phyllica*, *Passerina*, Penaeaceae, *Cliffortia*, etc.

14. *C. planiflora* Ten., Fl. Napolit. 3 (1824–1829), p. 250, pl. 220, f. 3; Yuncker, op. cit., p. 292.

This species is adopted here in a wider sense, as is done by Verdcourt in his unpublished account of the genus *Cuscuta* for the Flora of Trop. E. Africa. The following forms are regarded as synonyms or varieties: *C. abyssinica* A. Rich., *C. balansae* Boiss. & Reutt., *C. madagascarensis* Yunck. and probably also *C. brevistyla* A. Braun.

The typical *C. planiflora* var. *planiflora* is a plant which occurs in the Mediterranean region. The various varieties are found in the Mediterranean area (extending into Persia and India), throughout tropical Africa and in Madagascar. The following two varieties occur in Southern Africa.

- 14a. *C. planiflora* Ten. var. *mossamedensis* Welw. ex Hiern., Catal. Welw. Afr. Pl. 1:3 (1898), p. 743; Baker & Rendle in Fl. Trop. Afr. 4, 2 (1906), p. 203. *C. balansae* Boiss. & Reutt. var. *mossamedensis* (Welw. ex Hiern) Yuncker, op. cit., p. 291, fig. 154, F, G.

Type: *Welwitsch* 6141 (the specimen in K, according to Yuncker; more correctly, in my opinion, the specimen in BM).

Stems slender. *Flowers* 4-merous, in dense, few-flowered clusters, 2–3 mm. long. *Calyx* somewhat fleshy, the lobes triangular or triangulat-ovate. *Corolla* campanulate with spreading, triangular-ovate lobes which are shorter than the tube. *Stamens* shorter than the corolla-lobes, the subglobose anthers on short filaments. *Scales* usually shorter than the corolla-tube, rather deeply fringed, the fringes clavate, distinctly thickened at their tips. *Ovary* globose, styles very short, shorter than or equalling the cylindrical stigmas. *Capsule* globose, circumscissile near the base. *Seeds* small, ovoid, 0.5–0.75 mm. long.

S.W. AFRICA.—Okavango, Andara: *de Winter* 4459 (PRE). Okahandja, Okakuja: *Grosserth* in Herb. Dinter s.n. (SAM, H. No. 61987); Okahandja: *Dinter* 37 (SAM, PRE).

Hosts: *Indigofera* sp., *Barleria* sp., Monocotyledons, and *Welwitsch's* type on *Merremia multisepta* Hall. f. Also recorded from Angola.

The specimens cited above agree very well with Hiern's and Yuncker's description, except that the scales are different in that the fringes are somewhat clavate, thickened towards their apices, a character not mentioned by Hiern or Yuncker. However, an isotype of this variety (*Welwitsch* 6141 in COI) proved to possess the same thickened fringes and is identical with the S.W. African material.

14b. *C. planiflora* Ten. var. *madagascarensis* (Yuncker) A. Meeuse, comb. nov. *C. madagascarensis* Yuncker, op. cit., p. 276, fig. 277, incl. var. *schlechteri* Yunck., op. cit., p. 277.

Type of variety: *Baron* 3466 from Madagascar (K).

Stems medium. *Flowers* about 3 mm. long, in compact few-flowered clusters, 4- or 5-merous. *Calyx* rather loose about the corolla, the lobes ovate, often somewhat fleshy at the tips. *Corolla* membranous, campanulate; the lobes erect, ovate, obtuse, shorter than to about as long as the tube. *Stamens* shorter than the lobes, filaments slightly longer than the anthers. *Scales* ovate, oblong or spatulate, entire or somewhat bilobed, fringed mostly at the top, free at the apex. *Ovary* subglobose; styles and stigmas erect, rather thin, subequal, together usually about as long as the ovary. *Capsule* depressed-globose, circumscissile near the base. *Seeds* ovoid, hilum short oblong.

Madagascar, S. Africa, E. Africa.

NATAL.—Hilton Road: *Schlechter* 6761 (BOL, GRA, isotypes of *C. madagascarensis* Yunck. var. *schlechteri* Yunck.).

TRANSVAAL.—Letaba, Duiwelskloof: *Gerber* H. No. 5678 (PRE).

Hosts: Apparently low, herbaceous or suffruticose Dicotyledons. The var. *madagascarensis* seems to be a very rare form.

Dr. B. Verdcourt, in a private communication, pointed out that there is one specimen collected in East Africa (Kenya, Aberdares: *Fries* 2216, in K).

15. *C. epithymum* Murr. in *Linn.*, *Syst. Veg.* Ed. 13 (1774), p. 140; Yuncker op. cit., p. 283, fig. 151. *Cuscuta trifolii* Babingt. in *Phytologist* 1 (1843), p. 467.

Type: No type specimen, but Pinax (219) of Bauhin used as basis of the species (t. Yuncker).

Stems very slender, often reddish. *Flowers* about 3 mm. long, in dense many-flowered globose clusters, often reddish. *Calyx* usually about as long as the corolla-tube; the lobes triangular, acute. *Corolla-lobes* triangular, acute, spreading, shorter than the tube. *Stamens* shorter than the corolla-lobes; filaments longer than the anthers. *Scales* more or less spatulate, shorter than the corolla-tube, fringed mainly in the upper part, free at the apex. *Ovary* globose; stigmas filiform, slightly longer than the styles, together about twice as long as the ovary. *Capsule* globose, circumscissile near the base. *Seeds* usually 4, ovoid, about 1 mm. long, rather rugose, angular, compressed, hilum short, oblong, transverse.

A native of Europe, but spread with commerce throughout the world, mainly as an infestant of leguminous hosts.

CAPE PROVINCE.—E. London: *Dodd* s.n. (GRA). Port Alfred: *Hutton* 934 (GRA); Storms Riv.: *Laughton* s.n. (PRE).

ORANGE FREE STATE.—*Kretzmar* s.n. = H. No. 10188 (PRE).

TRANSVAAL.—Pretoria: *Van Gass* H. no. 947 (PRE); *Smith* 6215, 6218, 6221, 6235 (PRE).

Hosts: A great variety of plants, but outside its natural area of distribution chiefly on leguminous crops. In S. Africa this species has been recorded occasionally; the first records date from about 1894. It does not appear to be such a serious pest as *C. campestris*.

2. DICHONDRA

J. G. et R. Forst., Char. Gen. (1776), p. 39, t. 20; Choisy in DC., Prodr. 9 (1845), p. 451; Benth. & Hook., Gen. Pl. 2 (1876), p. 879; Peter in Engl. u. Prantl, Nat. Pfl. Fam., Ed. 1, 4·3a (1891), p. 13; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 569 and 18 (1893), p. 82; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 83; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 65; Ooststr. in Blumea 3 (1938), p. 72 and in Steenis, Fl. Males. Ser. 1, 4·4 (1953) p. 394; Phillips, Gen. S. Afr. Flow. Pl., Ed. 2 (1951), p. 621.

Small creeping herbs. *Leaves* simple, petioled, cordate-orbicular or reniform, entire. *Flowers* small to minute, solitary, axillary, pedicellate; bracteoles 2, minute, subulate. *Sepals* 5, free or rarely so, subequal, often spatulate, somewhat accrescent. *Corolla* widely campanulate, deeply 5-lobed, not much longer than the calyx, hirsute outside, the lobes induplicate-valvate. *Genitalia* included. *Stamens* 5; filaments filiform, short, inserted in the corolla-tube between the lobes; anthers oblong to subglobose; pollen smooth. *Ovary* deeply 2-lobed; each lobe 1-celled, 2-ovuled; styles 2, gynobasic and inserted between the lobes, short, filiform; stigmas capitate. *Capsule* 2-lobed; the lobes erect, membranous, 1- or rarely 2-seeded, indehiscent or irregularly 2-valved. *Seeds* subglobose, smooth, with thin crustaceous testa; cotyledons linear-oblong or elliptic, more or less spirally coiled or plicate (twice folded); radicle curved, terete; endosperm scanty.

Type Species: *Dichondra repens* J. G. et R. Forst.

A small genus of 4–5 species, principally American, with one species in the tropical and subtropical regions of both hemispheres.

D. repens *J. G. et R. Forst.*, Char. Gen. (1776), p. 40, t. 20; Choisy op. cit. p. 451; Hall. f., op. cit., 18 (1893), p. 82; Baker & Wright, op. cit., p. 83; Baker & Rendle, op. cit., p. 65; Van Ooststr., op. cit. (1938), p. 72 (1953), p. 395.

Type: The exact holotype of most of the Forsters' species cannot be indicated, their specimens being widely distributed and represented in many herbaria [See E. D. Merrill in Chron. Bot. 14: 208–211 (1954)].

Creeping perennial herb. *Stems* slender, rooting at the nodes, shortly hairy. *Leaves* long-petioled, reniform to cordate-orbicular, 4–25 mm. in diam., broadly cordate at the base, broadly rounded or emarginate at the apex, adpressed-hairy to strigose on lower surface usually glabrescent on upper surface; petioles usually densely adpressed-hairy. *Flowers* solitary, pedicels usually shorter than the petiole, terete, hairy like the petioles. *Sepals* obovate-oblong to spatulate, obtuse, 2–3 mm. long, hairy on back and margins. *Corolla* shorter to slightly longer than the calyx, deeply 5-lobed, greenish-yellowish. *Stamens* shorter than the corolla; filaments filiform; anthers small; pollen smooth. *Capsule* 2-lobed, lobes pilose, 1- or rarely 2-seeded; indehiscent or irregularly 2-valved. *Seeds* subglobose, smooth, glabrous.

Widely spread in the warmer regions of both hemispheres. Wide-spread in the Union, but probably often overlooked on account of its very small, inconspicuous flowers and its resemblance to species of *Centella* and *Hydrocotyle*, which occur in similar habitats (moist places).

CAPE PROVINCE.—Cape Peninsula: *Ecklon* 15 (= ? No. 406 mentioned in Fl. Cap.) (SAM); *Schlechter* 723 (BOL); *Compton* 3493 (BOL, NBG); *Salter* 8694 (BOL); *Momis* 101 (NBG). Rondebosch and Newlands: *Schlechter* s.n. (BOL, H. no. 25045). Knysna: *Duthie* 695 (BOL). Port Elizabeth: *I. L. Drège* s.n. (GRA). Grahamstown: *Archibald* 1781 (PRE). Griqualand East: *Baur* 490 (SAM, probably from Baziya, Umtata).

NATAL.—Isipingo: *Franks* in herb. Wood no. 11062 (NH). Durban, Bluff: *Meebold* s.n. (NH, H. no. 23127). Umzinyati Valley: *Wood* 1379 (BOL, NH, PRE, SAM). Estcourt: *West* 1845 (NH).

TRANSVAAL.—Marico, Zeerust: *Leendertz* 4170 (PRE). Ventersdorp: *Sutton* 699 (PRE). Potchefstroom: *Louw* 1055 (PRE); Leeuwpoot: *Mogg* 23007 (PRE). Krugersdorp: *Moss* 8125 (J); *Mogg* 23202 (PRE). Johannesburg: *Wallace* s.n. (PRE); *Gilliland* (J, H. no. 25415). Brits, Wolhuterskop: *Nunns* s.n. (PRE, H. no. 18772). Pretoria, Pretoria: *Chippindall* 30 (PRE); Hennops Riv.: *Prosser* 1627 (J, PRE); *Meeuse* 9625 (PRE). Middelburg: *Mogg* 16921 (PRE). Pietersburg, Spelonken: *Junod* 38 (PRE). Zoutpansberg, Louis Trichardt: *Young* s.n. (PRE, h. no. 26963); between Louis Trichardt and Entabeni: *Meeuse* 9215 (PRE). Transvaal, without precise locality: *Burt-Davy* 15144 (J).

3. FALKIA

Linn. f., Suppl. (1781), p. 30; *Thunb.*, Nov. Gen. (1781), p. 17 (“*Falckia*”); *Choisy* in DC., Prodr. 9 (1845), p. 451; *Benth. & Hook.*, Gen. Pl. 2 (1876), p. 878; *Peter* in Engl. & Prantl, Nat. Pfl. fam. Ed. 1, 4·3a (1891), p. 14; *Hall. f.* in Engl. Bot. Jb. 16 (1893), p. 569 and 18 (1893), p. 84; *Baker & Wright* in Dyer, Fl. Cap. 4, 2 (1904), p. 81; *Baker & Rendle* in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 65; *Phillips*, Gen. S. Afr. Flow. Pl. Ed. 2 (1951), p. 621.

Dwarf, prostrate, often matted, perennial herbs with petioled, ovate or cordate-orbicular to oblong-lanceolate, entire leaves and small solitary, axillary, peduncled flowers. *Calyx* shorter than the corolla-tube, sepals broad, divided nearly to the base or forming a short tube, subequal, accrescent. *Corolla-tube* funnel-shaped or campanulate; limb plicate, 5-angled or shortly and broadly 5-lobed. *Stamens* 5, inserted on the corolla-tube, included; filaments linear; anthers oblong. *Ovary* deeply 4-lobed, with a single ovule in each lobe, hairy; styles 2, gynobasic, almost equalling the corolla-tube, linear or filiform; stigmas subglobose. *Fruit* divided into four membranous utricles (sometimes fewer by abortion). *Seeds* obovoid, or subglobose; testa crustaceous; embryo curved; cotyledons flat, plicate; endosperm scanty.

Type Species: *Falkia repens* Linn. f., Suppl. (1781), p. 211.

Two species, natives of Africa, one confined to the Cape Province, the second wide-spread from Natal and the Orange Free State to Abyssinia.

Leaves broadly ovate to reniform, about as long as broad or slightly longer than broad, distinctly cordate at the base..... 1. *F. repens*.

Leaves oblong to lanceolate-oblong or lanceolate, usually about twice as long as broad, but varying from less than twice as long to several times longer than broad, never distinctly cordate at the base..... 2. *F. oblonga*.

1. *F. repens* Linn. f., Suppl. (1781), p. 211; Thunb., Nov. Gen. (1781), p. 17; Choisy, op. cit., p. 451; Hall. f., op. cit., 18 (1893), p. 84 (incl. var. *sericea*); Baker & Wright, op. cit., p. 81 incl. vars.; Adamson & Salter, Fl. Cape Penins. (1950), p. 686. *F. villosa* Hall. f., op. cit. 18 (1893), p. 85. *F. diffusa*, (Choisy) Hall. f., l.c. (pro parte?) *F. dichondroides* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 82.

Type: It is evident that Thunberg must have shown his specimen of *F. repens* to the younger Linnaeus (or sent him a duplicate), but as there is no specimen in the Linnaean herbarium or in the Stockholm herbarium, Thunberg's specimen in the herbarium Uppsala must be considered to be the lecto-type.

The publication by Linn. f. prior to Thunberg's publication of the same species in the same year is probably one of the cases of "snatching" emphasized by Otto Kuntze in his "Revisio". According to Juel [in *Plantae Thunbergianae*, (1918), p. 8 ff.] the publication of many of Thunberg's plants by the younger Linnaeus was done by mutual co-operation. At any rate, the publication of the younger Linné's *Supplementum Plantarum* is generally assumed (by inference) to antedate Thunberg's *Nova Genera Plantarum* and, therefore, "Linn. f." has to be cited as the author of both the genus *Falkia* and the species *Falkia repens*. I am of the opinion that Juel was wrong when he cited *Falkia* (or *Falckia*) *repens* "Thunb." As regards the spelling, Thunberg named it after Falck and spelled it "*Falckia*", but Linnaeus the younger adopted the spelling *Falkia* and this spelling has to be retained.

Creeping perennial herb, hairy to glabrous, often covering large patches of ground. *Stems* slender but firm, terete, up to 50 cm. long and over, rooting at the nodes. *Leaves* cordate-ovate to orbicular, 6–25 mm. long and wide; base distinctly cordate, apex rounded to emarginate, petiole shorter or longer than the blade. *Peduncle* 1-flowered about as long as leaf and petiole, recurved in fruit. *Calyx* 4–7 mm. long, lobes at first oblong, becoming ovate and deltoid to subcordate, crisped along the edges and enlarged in fruit. *Corolla* about as long to twice as long as the calyx, white to pale pink drying yellow, shallowly to deeply lobed. *Stamens* inserted low down in the corolla-tube; anthers roundish; pollen smooth. *Ovary* deeply 4-lobed, each lobe 1-ovuled; styles 2, subulate, gynobasic; stigmas capitate. *Capsule* membranous, completely enclosed by the accrescent, marcescent calyx, about 2 mm. long.

F. repens has been recorded from the following districts: Tulbagh, Cape Peninsula, Wynberg, Somerset, Caledon, Robertson, Bredasdorp, Riversdale, Mossel Bay, George, Port Elizabeth, Uitenhage, Somerset East, Bedford, Albany, Victoria East, Bathurst, Keiskammahoek, Stutterheim, King William's Town, East London, Komgha, Kentani, Umtata, Umzinkulu, Port Shepstone.

Falkia dichondroides is distinguished in Flora Capensis as having the corolla scarcely longer than the calyx and distinctly lobed, whereas the corolla in *F. repens* is mentioned as "twice as long as the calyx" and scarcely lobed. It is impossible to distinguish the two forms in the herbarium, because lobed corolla-limbs occur in specimens with long corollas, and slightly lobed limbs in specimens with short corollas. Dr. R. Story, who studied the vegetation of the Eastern Cape Province, kindly supplied n (based upon observations in the field apart

from herbarium specimens) most plants in the Eastern Cape Province could be referred to either "*F. repens*" or to "*F. dichondroides*" of the Flora Capensis.

Although the name *F. dichondroides* is reduced to a synonym, it is necessary from a nomenclatural point of view to point out that this name is illegitimate. Hallier (in Engl. Bot. Jb. 18, p. 85) described a species *F. diffusa* and quotes "*F. repens* α *diffusa* Choisy in DC. Pr. 9, p. 451" as a synonym. Choisy did not cite any specimens which he referred to his variety *diffusa*, but Professor Baehni of the Geneva herbarium kindly sent me those annotated specimens which Choisy himself had named *F. repens* α *diffusa* and those which Hallier referred to *F. diffusa*. There is only one sheet (leg. Drège, from Enon, Zuurberg, with an original label in E. Meyer's handwriting "*Falkia repens* Th. d.") on which Choisy (in 1841) has annotated: "*F. repens* var. *diffusa*". A label attached by Hallier (1898) says: "*Falkia repens* L.". Another sheet of Drège's "*Falkia repens* Th. d." in G bears only a label by Hallier, dated 1892, "*Falkia diffusa* m.". Hallier, in 1893, quoted "*F. repens* Th. d, Drège" among the specimens he referred to *F. diffusa*, and although he may have referred two sheets of the same Drège gathering to two different species, he had perhaps changed his mind in 1898. However, another sheet of the same Drège gathering "*Falkia repens* Th. d." in the Leiden herbarium, annotated by Hallier in 1909 or 1910, was referred by him to *F. diffusa* Hall. f. At any rate, the name *Falkia diffusa* can only be retained for forms of which the sheet annotated by Choisy is the type. In my opinion, the two sheets leg. Drège in the Geneva herbarium represent the same thing, i.e., the form named *F. dichondroides* in Flora Capensis. The gathering "*F. repens* Th. d" of Drège is cited in Flora Capensis under *F. dichondroides*, so that Choisy's type is mentioned among the specimens quoted under this newly described species. For this reason *F. dichondroides* becomes a synonym of *F. diffusa*.

F. repens buries its fruits actively into the soil by a downward bending of the peduncles after flowering. The persistent, hard calyx which encloses the ripe fruit serves as a protection during this process.

2. *F. oblonga* Bernh. apud Krauss in Flora 27 (1844), p. 830; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 84, and in Bull. Herb. Boiss 7 (1899), p. 41; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 82, incl. var. *minor* C. H. Wright; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 65. *F. abyssinica* Engl., Hochgebirgsfl. Trop. Afr. (1892), p. 344; Hall. f., op. cit. (1893), p. 84.

Type: Krauss 359 from Natal, nr. Umlaas Riv. (isotype K).

Leaves about twice as long to several times as long as broad, up to about 7 cm. long and 1.5 cm. wide, never distinctly cordate but usually rounded at the base, otherwise as *F. repens*.

South Africa, Portuguese East Africa, also in Abyssinia, Eritrea and Somaliland.

BECHUANALAND.—(Omaramba u Omatako).

GRIQUALAND-WEST.—Vryburg, Mafeking, Barkly West, Kimberley.

TRANSVAAL.—Lichtenburg, Marico, Potchefstroom, Vereeniging, Johannesburg, Krugersdorp, Springs, Boksburg, Benoni, Pretoria, Pietersburg, Lydenburg, Bethal, Carolina, Heidelberg, Standerton.

ORANGE FREE STATE.—Vredefort, Kroonstad, Senekal, Bloemfontein, Fauresmith.

EASTERN CAPE.—Albert, Aliwal North, Richmond, Fort Beaufort, Middelburg, Queenstown, Pt. St. Johns.

NATAL.—Durban.

PORTUGUESE E. AFRICA.—Lourenço Marques.

An isotype (*Krauss 359, K*) was studied by Mr. de Winter, who reported that the leaves are up to about 2 cm. long. Actually the leaves vary a great deal in shape, length and pubescence; they can be from lanceolate to oblong-orbicular, from \pm 1 cm. to 7 cm. in length, from acute to obtuse, from villous or tomentose to almost glabrous. In my opinion, these forms are only ecotypes and not worth varietal rank.

F. oblonga is very close to *F. repens* and it is even possible that they are not more than different subspecies or varieties. They are, however, almost completely geographically separated and that is, apart from the difference in the shape of the leaf-base, why I hesitate to regard them as one species.

F. oblonga is wide-spread in S. Africa, but very scattered, most probably because it is found in wet places (as is *F. repens*) and its ecological requirements make it a species of local occurrence.

4. EVOLVULUS

L., Sp. Pl. Ed. 2 (1762), p. 391; S. J. van Oostroom, "A Monograph of the Genus *Evolvulus*", Meded. Bot. Mus. Herb. Utrecht No. 14 (1934); Philips, Gen. S. Afr. Fl. Pl. Ed. 2 (1951), p. 62.

Type Species: *E. nummularius* L., Sp. Pl. Ed. 2 (1762), p. 391.

Annual or perennial herbs or suffrutices, not twining. *Leaves* usually small, entire, often sessile. *Inflorescences* usually axillary, 1-3-nate; bracteoles small. *Sepals* 5. *Corolla* funnel-shaped or campanulate to subrotate, the limb 5-angled or shortly 5-lobed. *Stamens* 5, inserted above the middle of the corolla-tube, rarely near the base; filaments linear; anthers linear. *Ovary* 2-celled, or 1-chambered by abortion, 4-ovuled; styles 2, free from the base, each divided above or almost to the base, stigmas 4, linear-terete or sub-clavate. *Capsule* subglobose, 2-4-valved. *Seeds* 4 or fewer by abortion, glabrous.

Distribution: 97 species mentioned by Van Oostroom, all American, with the exception of two species, viz. the circum-tropical *E. alsinoides*, and *E. nummularius* (America, Africa, Madagascar, introduced in India). One species in S. Africa.

***E. alsinoides* (L.) L.**, Sp. Pl. Ed. 2 (1762), p. 392; Van Ooststr. op cit., p. 26 (for full synonymy, cf. Van Ooststr., l.c.).

Type: In the Linnean herbarium (*teste* Van Oostroom).

Perennial herb, thinly or sometimes rather densely covered with patent pilose hairs. *Stems* few to several, erect or decumbent, slender, up to 30 cm. sometimes to 60 cm. long. *Leaves* nearly sessile, ovate-oblong to lanceolate, entire, obtuse, distinctly mucronate, 10-20 (-30) mm. long. *Peduncles* filiform, shorter to much longer than the leaves, one- to few-flowered; bracts minute, linear; pedicels as long as or longer than the calyx, spreading. *Calyx* densely silky or villous; sepals lanceolate, acute to acuminate, 3-4 mm. long. *Corolla* rotate, 6-8 mm. in diam., bright light blue or occasionally white. *Ovary* 2-celled, each cell 2-ovuled, glabrous; styles 2, stigmas 4, long, terete or subclavate. *Capsule* depressed-globose, glabrous, 4-valved, fragile, about as long as the calyx. *Seeds* 4 or less, black, smooth, glabrous.

Northern districts of *S.W. Africa*; *Griqualand-West*: Kuruman, Vryburg, Barkly-West, Hay, Herbert, Kimberley; *Bechuanaland*; *Transvaal*: Marico, Rustenburg, Potchefstroom, Pretoria, Lydenburg, Barberton and districts to the N. of these; *Swaziland*; *Natal* and *Zululand* as far S. as Umzinto. Common and wide-spread.

NOTE.—This species is very variable and Van Oostroom distinguished a number of varieties. All the South African specimens I have seen are referable to the var.

linifolius (L.) Baker. I have not seen a single specimen referable to the var. *glaber*; Flora Capensis and Van Ooststroom mention only one specimen from South Africa, viz. *Gerrard* 1907 from Natal, which I have not seen.

5. SEDDERA

Hochst. in Flora 27 (1844), Bes. Beil. 7, t. 5; Choisy in DC. Prodr. 9 (1845), p. 440; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 572, and 18 (1893), p. 88; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 73. *Breweria* R. Br., Prodr. Fl. Nov. Holl. (1810), p. 487, pro parte; Benth. & Hook., Gen. Pl. 2 (1876), p. 876; Peter in Engl. u. Prantl, Natürl Pflanzenfam., ed. 1., 4·3a (1891), p. 16; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 79; Phillips, Gen. S. Africa Fl. Pl. Ed. 2 (1951), p. 622, pro parte.

Type Species: *Seddera virgata* Hochst. et Steud. in Flora 27 (1844), Bes. Beil. 8. t.5, figs. 1-20.

Small prostrate to suberect *shrubs* or *suffrutices*, never climbing. *Leaves* small entire. *Flowers* axillary, sessile or pedunculate, solitary or aggregated into few-flowered clusters or pedunculate cymes which sometimes form leafy terminal spikes or panicles. *Bracteoles* usually small. *Sepals* 5, acute or obtuse, subequal or the outer ones slightly larger. *Corolla* small, (always?) white, funnel-shaped, the limb usually shallowly lobed; the midpetaline areas hairy at least at the tips. *Stamens* inserted low down in the corolla-tube; filaments filiform, dilated at the base and often appendaged; anthers oblong; pollen smooth. *Disc* none or small. *Ovary* 2-celled, 4-ovuled, hairy at the apex, style bifid almost or quite to the base; stigmas more or less peltate and orbicular, sometimes bilobed. *Capsule* 4-valved. *Seeds* dark brown or black, glabrous.

Distribution: About 15 species, mainly restricted to Africa, Madagascar and Arabia, one in India.

As regards the synonymy, Hallier (Engl. Jb. 16, p. 563 in the key and p. 572) pointed out the differences between *Seddera* and *Bonamia* (= *Breweria* R.Br. s.s.). *Seddera* is always erect or prostrate, suffruticose or shrubby, with small flowers, glabrous stamens and peltate stigmas; *Bonamia* is herbaceous, suffruticose or woody and climbing (all African species are shrubby and usually climbing) with usually large flowers, with filaments which are usually glandular-villose at the base, very rarely glabrous (glabrous in the only S. African species) and (in the African species) with 2 globose stigmas.

Phillips, l.c., pointed out that the styles in *Seddera* are free or more or less united so that "the only difference" between *Seddera* and *Breweria* does not hold true, but Hallier does not mention the style character at all, on the contrary, in his generic diagnosis of *Seddera* he mentions "stylus 2-fidus vel styli 2". *Seddera* can always be distinguished from *Bonamia* by a combination of characters and by its habit, so that it is better to retain *Seddera* Hochst. as a separate genus, distinct from *Bonamia* Thouars (which includes *Breweria*).

Flowers always solitary, sessile or very rarely pedicellate; calyx 7-10 mm. long, the sepals ciliate with bulbous-based hairs; corolla \pm 10 mm. long or longer; mid-petaline areas with a few long strigose hairs; leaves usually more or less ciliate with bulbous-based hairs and, therefore, in most cases appearing minutely dentate or serrate; pubescence of stems, leaves and calyx usually distinctly brown or ferruginous.....

1. *S. capensis*.

Flowers usually in few-flowered axillary cymes, rarely all solitary, sessile or pedunculate (peduncles up to 35 mm. long); calyx usually only 4-7 mm. long (if longer, densely tomentose, the sepals not ciliate); corolla usually 6-7 mm. long (if longer, midpetaline areas rather densely pubescent); leaves more or less silky or shortly pubescent, not with bulbous-based hairs and appearing quite entire; pubescence of all parts almost invariably white or grey.....

2. *S. suffruticosa*.

1. *S. capensis* (E. Mey. ex Choisy) Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 529; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 77. *Evolvulus capensis* E. Mey. ex Drège, Zw. Pfl. geog. Doc. (1843), p. 46, nomen tantum; ex Choisy in DC., Prodr. 9 (1845), p. 444; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 86. *Breweria capensis* (E. Mey. ex Choisy) Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 80. *Bonamia capensis* (E. Mey. ex Choisy) Burt Davy in Ann. Transv. Mus. 3 (1912), p. 121.

Type: A specimen leg. Drège from Shiloh (E. Cape) in herb. Geneva (isotypes seen in L).

Suffruticose perennial. *Stems* several from a firm woody taproot, up to 30 cm. long but often much shorter, prostrate to suberect, firm, terete, covered with rusty-brown adpressed to patent stiff hairs as are petioles, leaves, pedicels, calyces and mid-petaline areas of the corolla. *Leaves* ovate, ovate-lanceolate or oblong, sessile or shortly petioled, strigose on both sides, more laxly so when older, 8–25 mm. long and 4–12 mm. wide, obtuse or subacute, minutely mucronate, rounded to somewhat narrowed or truncate at the base, ciliate with bulbous-based hairs along the margin. *Flowers* axillary, solitary, usually sessile, pedicels rarely up to 10 mm. long. *Bracteoles* 2, lanceolate, shorter than the sepals. *Sepals* broadly lanceolate, acute, 6–8 mm. long. *Corolla* broadly funnelshaped, white, 8–12 mm. long. *Ovary* hairy at the apex. *Capsule* subglobose, usually crowned with a tuft of hairs, about 5 mm. in diam. *Seeds* black, glabrous smooth.

Recorded from the following areas: *Bechuanaland* (Mochudi, one record only); *Griëqualand W.* (Kuruman, Barkly West); *Transvaal* (Marico, Bloemhof, Christiana, Potchefstroom, Vereeniging, Pretoria, Letaba); *Orange Free State* (Hoopstad, Kroonstad, Ventersburg, Bloemfontein); *Natal* (Estcourt, "Upper Tugela"); *E. Cape* (Queenstown, nr. Kei River). Extends into Southern Rhodesia.

2. *S. suffruticosa* (Schinz) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 88; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 77. *Breweria suffruticosa* Schinz in Verhandl. Bot. Ver. Brandenb. 30 (Sept. 1888), p. 275; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1905), p. 80. *Convolvulus mucronatus* Engl. in Engl. Bot. Jb. 10 (Oct. 1888), p. 246. *Seddera mucronata* (Engl.) Hall. f., op. cit., p. 88. *Breweria baccharoides* Baker in Kew Bull. 1894, p. 68. *B. sessiflora* Baker, l.c. *Seddera welwitschii* Hall. f., op. cit., p. 88; Baker & Rendle, op. cit., p. 77. *Bonamia suffruticosa* (Schinz) Burt Davy in Ann. Transv. Mus. 3 (1912), p. 121.

Type: Schinz 750 from Oshando, S.W. Africa, in herb. Zurich (isotypes seen in BOL, GRA, and L).

Suffruticose or herbaceous perennial, extremely variable. *Stems* several to many from the base, often woody, firm, but young ones often slender, herbaceous; suberect or erect, rarely prostrate, terete or subterete, at first more or less densely covered with stiff, almost invariably whitish hairs to villous, ultimately glabrous and making a thin corky bark, 15–50 cm. long. *Leaves* varying from lanceolate to broadly elliptic-oblong (5–) 10–25 (–40) mm. long and (2–) 4–10 (–18) mm. wide, acuminate, acute or rounded at the apex, mucronate, strigose with whitish hairs on both sides, margin entire; petioles up to 4 mm. long. *Flowers* in axillary clusters or sometimes, or partly, solitary, sessile, rarely pedunculate; peduncles, if present, up to 3 cm. long, terete, slender, bearing one to several flowers in a capituliform cyme. *Bracteoles* shorter than the calyx, lanceolate. *Calyx* 5–9 mm. long, thinly strigose to densely villous; three outer sepals lanceolate, acuminate, inner ones slightly shorter. *Corolla* somewhat campanulate, white, 6–12 mm. long; limb rather spreading; midpetaline areas more or less densely silky-strigose. *Ovary* hairy at the apex. *Capsule* ovoid-subglobose with some white hairs near the apex, about 5 mm. in diam. and about 6 mm. long. *Seeds* black, glabrous, smooth.

South Africa, extending into Angola, Bechuanaland, Southern Rhodesia, Portuguese East Africa and possibly into tropical East Africa.

Recorded from: *S.W. Africa* (N. districts; one of the sheets, viz., *Dinter 55*, bears a manuscript name, *Evolvulus Juttae* Dinter Ms., in SAM); *Bechuanaland*; *Griqualand West* (Vryburg, Taungs, Kuruman, Barkly West, Hay, Herbert, Kimberley); *Transvaal* (Brits, Pretoria, Bronkhorstspuit, Waterberg, Groblersdal, Potgietersrust, Pietersburg, Zoutpansberg, Letaba, Barberton); *Portuguese East Africa* (Lourenço Marques).

This species is rather variable in its pubescence, the size of the leaves and the length of the peduncles. Hairy forms have been placed in a var. *hirsutissima* Hall. f. [in Bull. Herb. Boiss. 6 (1898), p. 531], but as far as I can see all these forms intergrade. The peduncles, usually undeveloped, may attain a length of 35 mm. as, for instance, in *Hutchinson 2478* (from Barberton, Louw's Creek), *Turner 10* (Waterberg, Tvl.), *Gomes e Sousa 144* (Lourenço Marques) and these specimens approach, according to Mr. de Winter who compared the type, *S. welwitschii* Hall. f., but are not quite identical. Several authentic specimens of *S. welwitschii* I saw in COI (*Welwitsch 6152*, 6154 and 6159) are very similar to forms of *S. suffruticosa*. The specimen *Welwitsch 6159*, which number was referred by Hallier [in Bull. Herb. Boiss. 5 (1897), p. 1009], to *S. welwitschii* var., and by Hiern [in Cat. Welw. Afr. Pl. (1898), p. 735] and Rendle (in Fl. Trop. Afr. 4, 2, p. 77) to *S. welwitschii* var. *bakeri* Hiern, is indistinguishable from the type of *S. suffruticosa* (*Schinz 750*). Therefore, in my opinion, *S. welwitschii* is only a synonym of *S. suffruticosa*. This does not affect the name of the South African plants, because the oldest epithet is *Breweria suffruticosa* Schinz (Sept. 1888), which antedates Engler's *Convolvulus mucronatus* (Oct. 1888) by a few weeks and *Seddera welwitschii* (1893) by several years. The types or isotypes of *Convolvulus mucronatus*, *Breweria baccharoides* and *B. sessiliflora* were either compared by myself or by Mr. de Winter and they all do not appear to be specifically distinct.

6. BONAMIA

Dupetit-Thouars in Hist. Veg. Isl. Austr. Afr. (1804), p. 33, t. 8, et in Dict. Sci. Nat. 5 (1806), p. 145, nom. cons.; Poir. in Lam., Encycl. Méth., Bot., Suppl. (1810), p. 677; Choisy in DC., Prodr. 9 (1845), p. 439; Benth. and Hook., Gen. Pl. 2 (1876), p. 877; Peter in Engl. u. Prantl, Natürl. Pfl. fam. 4·3a (1891), p. 17, 376; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 527, 573, and in Bull. Herb. Boissier 5 (1897), p. 804, 996; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 78; Oostr. in Blumea 3 (1938), p. 75, and in Steen., Fl. Males., Ser. 1, 4·4 (1953), p. 398. *Breweria* R.Br., Prodr. Fl. Nov. Holl. ed. 1 (1810), p. 487. *Metaporana* N.E.Br. in Kew Bull. 1914, p. 168.

Type species: *Bonamia madagascariensis* Poir., l.c. [see Kew Bull. 1935, p. 381, where also the conservation of *Bonamia* Dupetit-Thouars against *Bonamya* Neck. (= *Stachys* L.) is discussed].

Herbaceous or woody twiners, rarely erect undershrubs. *Leaves* herbaceous or occasionally subcoriaceous, entire, lanceolate, ovate or elliptic. *Flowers* axillary, solitary or cymose, cymes sometimes forming terminal leafy panicles, bracteoles usually small. *Sepals* 5, equal or subequal, rarely very unequal, orbicular to lanceolate, herbaceous or coriaceous, never membranous. *Corolla* funnel-shaped, small or medium-sized, blue or white, 5-lobed, with the midpetaline bands hairy outside. *Stamens* 5, included or slightly exerted, filaments glandular at the base or glabrous, anthers oblong, cordate or sagittate at the base, pollen smooth. *Ovary* 2-celled, 4-ovuled; style bifid or 2 free styles, often unequal in length; stigmas 2, globose or peltate, rarely 2-partite disc small or none. *Capsule* 2-, 4- or 8-valved, 2-loculated, 4- or, by abortion, less-seeded. *Seeds* glabrous or pilose.

Number of species about 40, widely spread in the tropics.

This genus is very similar in most floral characters to *Seddera* Hochst., but it can usually be easily distinguished by its habit and by the stamens (often with 2 basal small teeth in *Seddera*, often glandular in *Bonamia*). The S.W. African species, here referred to *Bonamia*, was originally described by Hallier as a *Seddera* but the resemblance of the species under discussion to *Bonamia poranoides* Hall. f. (= *Porana densiflora* Hall. f.), the pedunculate inflorescence, the spatulate-suborbicular, imbricate, more or less rounded calyx-lobes, the stamens without teeth at the base and its general habit (straggling or climbing shrub) place it in *Bonamia* rather than in *Seddera*.

N. E. Brown described a genus *Metaporana*, based on this S.W. African species of *Bonamia* and on *Porana densiflora* Hall. f., but he overlooked the fact that Hallier had already transferred *Porana densiflora* to *Bonamia* as *B. poranoides* Hall. f. [in Bull. Herb. Boiss. 5 (1897), p. 1007]; the combination *B. densiflora* could not be applied to this species because of *B. densiflora* (Baker) Hall. f., op. cit., p. 999, based on *Breweria densiflora* Baker from Madagascar. This transfer was also overlooked in Fl. Trop. Afr., 4, 2 (1905), in which the species was still mentioned under *Porana densiflora* Hall. f. N. E. Brown only redescribed the genus *Bonamia* and *Metaporana* N.E.Br. is clearly a synonym of *Bonamia* Thouars. It is, in my opinion, doubtful if the genus *Porana* occurs in Africa at all.

B. schizantha (Hall. f.) A. Meeuse, comb. nov.—*Seddera schizantha* Hall. f. in Bull. Herb. Boiss 6 (1898), p. 532. *Metaporana angolensis* N.E.Br. in Kew Bull. 1914, p. 169.

Type: Newton (1883) no. 18 in Herb. Zurich (fide Hallier).

Much branched, erect to climbing shrub or undershrub. Branches up to at least 75 cm. long, terete, adpressed-pubescent; ultimate branchlets slender, terete, divaricate and subflexuose. Leaves very shortly petioled; petiole 1.5–3 mm. long; blade ovate-elliptic to oblong, obtuse, mucronate, rounded, subtruncate or subcordate at the base, 1–4 cm. long and 4–15 mm. wide, entire, penninerved, with sparse adpressed hairs or almost glabrous; lateral nerves 3 or 4 on either side, ascending, prominent below; reticulate coarse nervation distinct below, less conspicuous above. Peduncles in the leaf-axils, solitary or occasionally binate, slender, erecto-patent, subglabrous or adpressed-puberulous, 3–18 mm. long, bearing a dense dichasium or a single unilateral cyme, often collected into terminal panicles at the ends of the branches. Bracts and bracteoles minute, lanceolate, adpressed-puberulous, 1–1.5 mm. long. Pedicels slender, filiform, 2–3 mm. long. Sepals broadly ovate-spatulate to suborbicular, obtusely rotundate, subcoriaceous, 2 mm. long and 1.5–2 mm. wide, glabrous or with sparse adpressed pubescence, the margins membranaceous and partly ciliate. Corolla white; the tube cylindrical, 2 mm. long, the limb deeply 5-lobed, cut down to the calyx; the lobes 3 mm. long, 2–2.5 mm. wide, elliptic, obtuse, patent, outside with brownish strigose hairs in the midpetaline zones. Filaments glabrous, dilated but not toothed at the base, 2–3 mm. long, anthers nearly 1 mm. long. Ovary ovoid, glabrous except a few hairs at the apex; disc very low; styles 2, free to the base, equal, filiform, 4–4.5 mm. long. Capsule subglobose with conical apex, 3.5–4 mm. long and wide, exerted from the calyx, glabrous. Seeds small, glabrous, minutely punctate, trigonous, convex at the back, flattened at the sides, brown or black.

Angola (Southern part) and S.W. Africa.

S.W. AFRICA.—Fransfontein: *Liebenberg* 4948 (PRE); Klein Ameib: *Dinter* 7070 (PRE, BOL); between Okahandja and Swakopmund, Dorstrivier: *Dinter* 196 (SAM, PRE). Also collected by Mr. de Winter in the Omaruru district (PRE); apparently fairly common in the Kaokoveld (*Story, de Winter* in PRE).

The plants agree in every respect with Hallier's excellent description, and *Liebenberg* 4948 was compared by Miss Kies at Kew with *Pearson* 2873 and 2391, two of the original

numbers cited by N. E. Brown, of which it proved to be a very good match. *Dinter* 7070 was compared with a specimen named *Seddera schizantha* (from Damaraland, collector unknown, prob. *Dinter*) in herb. Kew by Dr. Schweikerdt in 1938 and was reported to match it.

7. CONVULVULUS

L. [Sp. Pl. Ed. 1 (1753), p. 153]; Gen. Pl. Ed. 5 (1754), p. 76; Choisy in DC., Prodr. 9 (1845), p. 399; Benth. et Hook. f., Gen. Plant. 2 (1876), p. 874; Peter in Engl. u. Prantl, Natürl. Pflanzenfam. Ed. 1, 4·3a (1891), p. 33; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 579; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 70; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 88; Phillips, Gen. S. Afr. Flow Pl. Ed. 2 (1951), p. 622.

Type species: *Convolvulus arvensis* L., Sp. Pl., Ed. 1 (1753), p. 153 (priority of place, as Linnaeus mentioned a number of species).

Perennial, sometimes annual, herbaceous to suffruticose, prostrate or climbing, rarely erect, shrubby. *Leaves* entire or lobed, often cordate, hastate or sagittate at the base, petiolate or sometimes sessile. *Flowers* regular, axillary, solitary or in few-flowered, sometimes subumbellate, cymes, small to medium-sized. *Sepals* 5, equal to unequal, persistent. *Corolla* funnel-shaped, in Southern Africa white or pale mauve to pink; the limb shallowly 5-lobed; midpetaline areas often hairy towards the apices. *Stamens* 5, usually unequal, filaments filiform or somewhat linear, often dilated at the base; pollen smooth, ellipsoid. *Disc* annular or cup-shaped. *Ovary* 2-celled, 4-ovuled; style filiform; stigmas 2, linear or filiform, rarely short, oblong. *Capsule* 2-celled, dehiscent, 4-valved. *Seeds* 4, sometimes less by abortion, black or brown, usually glabrous.

In the temperate and subtropical regions of both hemispheres, but much rarer in the tropics. Species ca. 250, of which 15 occur in S. Africa.

The mainly subtropical genus *Convolvulus* seems to be more or less vicarious with *Ipomoea*, the latter being mostly confined to the tropical regions.

It is difficult to divide *Convolvulus* into sections. An attempt was made by Peter (l.c.), but his system seems to be rather artificial; the leaf-shape in particular varies in many species.

There is considerable variation in leaf-shape in several South African representatives: from cordate or sagittate-hastate to narrowly hastate or sagittate with sometimes bifid basal lobes, and also from undivided, cordate or sagittate, to palmately or pinnately lobed; the palmately lobed leaves show a tendency towards reduction of the lateral lobes so that the leaves become linear with hastate or sagittate base, or auricled. The various shapes are sometimes found on one specimen [a typical example is *C. dregeanus*, this is also occasionally found in specimens of *C. boedeckerianus*, *C. "ornatus"*, (= *C. ocellatus*), *C. capensis*, and others], sometimes in a series of specimens covering the whole range of variation. The extremes are often strikingly different and many have been described as separate species, so that several pairs or trios of conspecific, extreme forms appear under different names; for example: *C. capensis* Burm. f. (dissected leaves)—*C. falkia* Jacq. non Thunb. (leaves not dissected)—*C. inconspicuus* Hall. f. (not dissected); *C. capensis* Burm. f. (leaves ovate to palmatifid)—*C. filiformis* Thunb. non Desr. (= *Merremia bowieana* Rendle; leaves linear with basal auricles); *C. natalensis* Bernh. (leaves more or less cordate)—*C. transvaalensis* Schltr. and *C. bullerianus* Rendle (leaves becoming narrowly hastate to linear with auricled base); *C. dregeanus* Choisy [leaves varying from suborbicular-ovate (lower ones) to palmately 5-fid (upper ones) on one specimen]—*C. liniformis* Rendle (leaves linear, minutely auricled at the base, occasionally upper ones becoming palmately 5-fid); *C. ornatus* Engl. (leaves elongate-hastate to lanceolate and auricled, upper

ones often palmately 5-fid)—*C. dinteri* Pilger (leaves linear or lanceolate to subhastate, basal auricles sometimes bifid)—*C. ocellatus* Hook. (leaves linear with small auricles or no auricles).

Once this tendency was recognised, it was fairly easy to group the South African species of *Convolvulus* into a distinct number of taxa by using distinguishing characters based on the flowers, peduncles, pedicels, etc. Almost needless to say, the number of species is less than that in the Flora Capensis (15 against 21). One species is not infrequently cultivated as an ornamental (*C. mauritanicus* Boiss. from N. Africa with blue flowers), but it is not included in this treatment. *Convolvulus arvensis* is an introduced weed which has become very common and wide-spread. As regards the key to the species of *Convolvulus*, the great variation in characters such as leaf-shape, lengths of peduncle and degree of pubescence, makes it very difficult to distinguish every not very typical specimen of a given species easily. For instance, *Convolvulus ulosepalus* in very depauperate specimens with 1-flowered peduncles resembles *C. boedeckerianus*; the polymorphous *C. sagittatus* sometimes resembles small-flowered specimens of *C. bidentatus*; *C. bidentatus* is sometimes difficult to separate from forms of *C. capensis*; *C. thumbergii* seems to grade into narrow-leaved forms of *C. natalensis*. Without the aid of sufficient authenticated herbarium specimens the key (and every other key for that matter) is not quite adequate to name every more or less atypical or depauperate specimen of any given species.

Corolla 4–5 times as long as the calyx, usually quite glabrous; sepals obtuse or rounded at the apex, usually glabrous but often minutely ciliate; peduncles mostly longer than the leaves, 1- or sometimes 2–3-flowered; leaves hastate-sagittate, entire (introduced weed)..... 15. *C. arvensis*.

Corolla less than 4–5 times as long as the calyx:

Flowers almost sessile (peduncles plus pedicels not exceeding 5 mm. in fruit), in few-flowered clusters or occasionally solitary; calyx 8–13 mm. long, accrescent, the outer sepals ultimately subcordate, crisped along the edges; corolla scarcely longer than the calyx (S.W. Africa) 1. *C. argillicola*.

Flowers distinctly pedunculate or at least pedicellate; peduncles plus pedicels usually over 5 mm. long, often much longer; corolla 1.5–3 × the length of the calyx:

All vegetative parts and flowers quite glabrous; peduncles 1-flowered; leaves varying in shape from linear, entire or with basal auricles, to palmatisect, often on one specimen, but always small, under 20 mm. long, rarely attaining 40 mm. in length..... 2. *C. dregeanus*.

Plants hairy on either stems, leaves or inflorescences, very rarely plants quite glabrous, but, if so, leaves different in shape or well over 20 mm. long and/or peduncles few-flowered:

Leaves (at least the upper ones) linear, hastate at the base with patent, often deeply bifid basal lobes; peduncles usually 2-flowered, sometimes 1-, rarely up to 6-flowered, usually rather long to long (3–14 cm.); sepals quite glabrous or occasionally obscurely pubescent, coriaceous with membranous edges, broad, rounded or obtuse, sometimes mucronate; corolla usually about 20 mm. long (coastal districts from Bredasdorp to East London, Uitenhage, Albany)... 10. *C. bidentatus*.

Leaves various, but, if linear and hastate or auricled at the base, either whole plant densely tomentose or basal lobes entire to faintly bilobed or calyx distinctly hairy; sepals often acute or without membranous edges:

Peduncles 0 or rarely up to ± 2 mm. long (bracteoles placed in the leaf axils or nearly so); flowers solitary; corolla up to ± 14 mm. long, its lobes usually distinctly acute:

Sepals densely tomentose, obtuse or subacute, often somewhat abruptly narrowed above the middle, 6–8 mm. long; corolla 12–14 mm. long; leaves often thick with revolute edges, densely tomentose, usually palmately 5-fid with linear lobes..... 3. *C. ocellatus*.

Sepals more or less laxly covered with silky, shiny, golden-brown hairs, more or less ovate; corolla \pm 9 mm. long; leaves flat and rather thin, pinnately lobed with the central lobe the largest, usually thinly hairy (also depauperated specimens of *C. ulosepalus* and *C. sagittatus*).....

4. *C. boedeckerianus*.

Peduncles usually distinct although occasionally very short (if so, flowers 14–16 mm. long or longer and/or lobes of corolla rounded or obtuse):

Leaves up to \pm 25 mm. long, with 5–9 narrow, linear or filiform, obtuse, palmately arranged lobes; plant usually finely, densely and very shortly white- or silvery-, more rarely fawnish-tomentose; calyx 6–8 mm. long, corolla 14–16 mm. long with more or less rounded lobes; peduncles always 1-flowered, short, up to 20 mm. long.....

5. *C. multifidus*.

Leaves different in shape or well over 25 mm. long or plant not very shortly tomentose; peduncles often more than 20 mm. long:

Peduncles usually 2–6-flowered, rarely 1-flowered:

Vegetative parts and peduncles densely and shortly, more or less adpressed-hairy to sericeo-tomentose, often canescent, sometimes fulvous; flowers up to \pm 14 mm. long; leaves oblong to linear-oblong, pinnately and more or less irregularly toothed to pinnatifid, often with toothed or dissected lateral lobes at the base.....

6. *C. aschersonii*.

Vegetative parts not so densely hairy or plants farinose; corolla 8–15 mm. long:

Corolla \pm 8 mm. long; sepals very unequal, the inner ones rotundate, abruptly apiculate; stamens not papillose at the base, leaves usually obtuse, mucronate linear to linear-oblong with hastate base and usually bifid basal lobes, margin usually entire, more rarely leaves wider, subsagittate and/or lobed or dissected at the base or margin irregularly dentate or crenate..

7. *C. ulosepalus*.

Corolla \pm 10 mm. long; sepals subequal; leaves linear to linear-oblong with hastate or sagittate base, entire or basal lobes dissected, usually obtuse, mucronate, margin entire or subentire

8. *C. sagittatus*.

Corolla 12–14 mm. long; sepals not so unequal as in *C. ulosepalus*, stamens papillose at the base; leaves in typical specimens cordate-deltoid or more or less sagittate, not dissected (basal lobes often more or less bilobed), more rarely basal lobes dissected, apex usually acute to acuminate, edge usually crenate.....

9. *C. farinosus*.

Corolla 15–20 mm. long or longer:

Leaves usually not dissected, often cordate or cordate-oblong, crenate, occasionally oblong to linear-sagittate; stems prostrate; corolla white or cream to greenish-white; sepals often crisped along the edges; bracts sometimes more than two together on one peduncle (not in S.W. Cape districts)..... 12. *C. natalensis*.

Leaves either dissected or, if entire, found in S.W. Cape districts; corolla often pale pink or rose-coloured (especially after drying):

Leaves pinnately nerved, linear to linear-oblong with hastate base and toothed to dissected margin; the margin of the central lobe often sinuous, or more or less irregularly pinnatifid to deeply pinnatisect; not in S.W. Cape districts..... 13. *C. thunbergii*.

Leaves palmately nerved, palmately lobed or palmatifid, occasionally linear with palmately arranged smaller basal lobes or auricled; if entire, more or less oblong-cordate, ovate-cordate to subreniform; S.W. Cape districts 14. *C. capensis*.

Peduncles usually 1(–2) flowered:

Corolla usually under 15 mm. long, often smaller, rarely up to \pm 20 mm. long, but if more than 15 mm. long, either leaves linear-sagittate or linear, or plants from S.W. Africa and Rhodesia:

Erect or prostrate, suffruticose, rarely climbing; whole plant densely tomentose or sericeous up to the sepals, leaves often with crenate and/or reflexed margins; peduncles up to \pm 10 mm. long, often shorter; pedicels up to \pm 15 mm. long (much shorter if peduncles are rather long) 3. *C. ocellatus*.

Prostrate to climbing, herbaceous, never so densely tomentose but usually thinly hairy; leaves not with reflexed margins; peduncles often more than 10 mm. long; pedicels usually short 8. *C. sagittatus*.

Corolla usually over 15 mm., often over 20 mm. long; leaves usually not linear, often more or less cordate or dissected, not found in S.W. Africa or Rhodesia:

Whole plant usually densely hairy to tomentose or shortly villous; leaves ovate-cordate-deltoid or oblong-cordate to deltoid, entire or finely crenate; calyx villous; sepals sharply and abruptly acuminate-apiculate; \pm 20 mm. long (only known from E. Cape Province)..... 11. *C. galpinii*.

Plant either not densely villous-hairy, or, if so, sepals usually not abruptly acuminate-apiculate and/or leaves different in shape:

Leaves usually not dissected, often cordate or cordate-oblong, crenate, occasionally oblong to linear-sagittate; stems prostrate; corolla white or cream to greenish-white; sepals often crisped along the edges; bracts sometimes more than two together on one peduncle (not in S.W. Cape districts).....

12. *C. natalensis*.

Leaves either dissected or, if entire, found in S.W. Cape districts; corolla often pale pink or rose-coloured, especially after drying:

Leaves pinnately nerved, linear to linear-oblong with hastate and toothed to dissected basal lobes; the margin of the central lobe often sinuous; or leaves irregularly pinnatilobed to pinnatisect; not in S.W. Cape districts

13. *C. thunbergii*.

Leaves palmately nerved, palmatilobed or palmatifid, occasionally linear with or without palmately arranged small basal lobes, or auricled; if entire, oblong-cordate, ovate-cordate to subreniform....

14. *C. capensis*.

1. *C. argillicola* Pilger in Engl. Bot. Jb. 48 (1912), p. 348; Dinter in Fedde Repert. 16 (1919), p. 240.

Type: Pilger mentioned two specimens, a flowering one (*Dinter* 1892) and a fruiting one (*Dinter* 2153), which represent the type for the flowers and for the fruits, respectively (herb. Berlin, now destroyed); the isosyntypes in SAM I now consider to be the neosyntypes.

Stems several from a perennial taproot, suffruticose at the base, prostrate, like the young parts, leaves, petioles and calyces densely covered with stiff rusty-brown or whitish hairs, ultimately glabrescent, rather firm and stout, terete and somewhat longitudinally striate, up to 70 cm. long. *Leaves* ovate or oblong in outline, obtuse or acute, usually with minute apical mucro, truncate to broadly and shallowly cordate at the base with the blade somewhat cuneately decurrent on the petiole, irregularly crenate or pinnatilobed to pinnatisect; the lobes usually obtuse often again crenate to somewhat lobed; length of blade 2-4 (-5) cm., width 1-2.5 (-3) cm., petioles slender, 0.5-2 (-3) cm. long. *Flowers* solitary or few together in the leaf-axils, nearly sessile; bracts subulate or lanceolate-subulate, 7-10 mm. long, hairy. *Sepals* unequal, the outer ones herbaceous, long-acuminate from an ovate base, 12-13 mm. long, acute, hirsute, the 2 inner ones shorter and narrower, indurate, caudate-acuminate, about 10 mm. long, glabrous except at the hirsute tips. *Corolla* white, about as long as the calyx, widely funnel-shaped to rotate, with a few stiff hairs towards the tips of the lobes on the midpetaline areas. *Ovary* glabrous. *Capsule* subglobose, about 9 mm. in diam. *Seeds* glabrous, verruculose or rugose, black, 5-6 mm. long.

S.W. AFRICA.—Okahandja: *Dinter* 1006 (SAM, PRE). Windhoek, nr. Seeis: *Codd* 5811 (PRE); Liechtenstein: *Dinter* 4284 (SAM); Northern part of Auas Mts.: *Dinter* 1892 (SAM, neotype for the fruits). Haris, Kuisib River bed: *Pearson* 9562

(SAM, BOL). Ukos: *Pearson* 9427 (BOL). Quartel nr. Rehoboth: *Dinter* 1892 (SAM, neotype for the flowers).

2. *C. dregeanus* *Choisy* in DC., Prodr. 9 (1845), p. 411; Hall f. in Engl. Bot. Jb. 18 (1893), p. 105; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 74. *C. liniformis* Rendle in Jl. Bot. 39 (1901), p. 61; Baker & Wright, op. cit., p. 71.

Type: *Drège* 7828 from Richmond, Winterveld (Cape Province), in Herb. Geneva.

Perennial, glabrous in all its parts, forming several annual stems from a common thick taproot. *Stems* trailing or ascending to suberect; sometimes branched from the base, very slender, up to about 30 cm. long; but often much shorter. *Leaves* small, variable in shape, sometimes lanceolate to linear, often with 2 minute basal auricles (and often close-set), acute, nearly sessile, 4–15 (–40) mm. long, but usually the lower ones oblong to ovate-suborbicular, entire, subcordate or more or less lobed, but gradually changing upwards into more deeply dissected leaves and upper ones deeply palmately 3–5-fid with linear lobes of which the middle one is the longest and sometimes somewhat pinnatifid, up to 20 (–25) mm. long; petioles of upper leaves up to 10 mm. long, but usually petioles much shorter. *Peduncles* 5–30 (–45) mm. long, 1-flowered, bracteoles lanceolate-linear to somewhat spatulate, about 2 mm. long, usually green and somewhat foliaceous; pedicels 1–5 mm. long or occasionally peduncles reduced and pedicels up to about 10 mm. long. *Calyx* 4–7 mm. long; sepals much imbricate, obovate or the outer oblong, obtuse. *Corolla* 12–20 mm. long, pinkish-white or white, glabrous. *Capsule* globose, glabrous, about 6 mm. in diam. *Seeds* scabrid to muriculate, about 4 mm. long.

Endemic.

CAPE PROVINCE.—Barkly West: *Lewis* h. no. 54140 (SAM); *Esterhuysen* 948 (BOL). Kimberley: *Wilman* h. no. 2962 (KMG) = prob. H. no. 25030 (BOL); *Oliver* h. no. 42282 (SAM); “Griqualand West, near the Vaal River”: *Nelson* 212 (PRE). Colesberg, Klein Tafelberg: *Burke* 284 (SAM). Hanover: *Sim* in herb. Galpin 6255 (PRE). Richmond: *Bolus* 13819 (BOL), id. Winterveld: *Drège* 7828 (L, isotype!). Middelburg: *Hutchinson* 3100 (BOL); *Gill* 85 (BOL). Graaff-Reinet: *Bolus* 1825 (BOL, GRA). Tarka: *Acocks* 16284 (PRE).

ORANGE FREE STATE.—Kroonstad: *Pont* 161, 579 (PRE). Bloemfontein: *Gemmell* 4952, 4976, 5640 (PRE). Fauresmith: *Verdoorn* 899 (PRE).

TRANSVAAL.—Wolmaransstad: *Sutton* 418 (PRE); *Liebenberg* 2983 (PRE). “Mooi Rivier” (Klerksdorp/Potchefstroom): *Burke* 283 (PRE, SAM, isotypes of *C. liniformis* Rendle). Potchefstroom: *Louw* 1690 (PRE). Johannesburg: *Galpin* 6255 (PRE).

The specimens described as *C. liniformis* Rendle represent prostrate shoots and they are linked up with “typical” *C. dregeanus* by intermediate forms. The specimen *Nelson* 212 in PRE, for instance agrees very well with *C. liniformis* Rendle, but the duplicate specimen of *Nelson* 212 at Kew was referred to *C. dregeanus* in Flora Capensis. Several specimens cited above show stems with entire, linear leaves in addition to stems showing the characteristic transition from entire, more or less ovate or oblong leaves to the dissected upper leaves, and some herbarium sheets contain several specimens showing plants of either type, evidently collected together in one locality. There is no difference in floral characters, capsules or seeds.

C. dregeanus is quite distinct and only *C. boedeckerianus* shows a superficial resemblance. However, *C. dregeanus* is the only South African species that is always quite glabrous in all its vegetative parts, and has a glabrous calyx and corolla.

3. *C. ocellatus* Hook. f. in Bot. Mag. 70 (1844), t. 4065; Choisy in DC., Prodr. 9 (1845), p. 404; Hall. f. in Engl. Bot. Jb. 18 (1894), p. 102; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 71.

This plant is rather polymorphous and two varieties can be distinguished:—

Leaves usually undissected, without basal auricles, not or rarely bullate, usually acute; peduncles developed though sometimes very short; sepals usually acute..... var. *ocellatus*.

Leaves often palmately 5-fid or with hastate basal auricles, more rarely entire; often bullate and obtuse; peduncles 0 or occasionally developed, up to 2(-5) mm. long; sepals often suddenly attenuate from the middle into an oblong, obtuse apex, rarely acute..... var. *ornatus*.

- 3a. *C. ocellatus* Hook. f. var. *ocellatus*. This form includes *Convolvulus randii* Rendle in J. Bot. 40 (1902), p. 189; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 95.

Type of var.: The type is evidently the plate in Bot. Mag. (t. 4065). Hooker stated: “. . . raised from seeds in the greenhouse of the Earl of Derby, at Knowsley . . .”, most probably from seeds collected by Burke, because Hooker mentioned: “discovered by Mr. Burke at Macalisberg”, and it is very unlikely that the seed could have been obtained from any other source. Consequently, *Burke* 119 from the Magaliesberg, Transvaal, is equivalent to a type specimen, though technically only a topotype.

Erect to decumbent *perennial* forming annual suffruticose stems from a woody taproot. *Stems* several from the base, densely brownish or greyish tomentose, up to about 60 cm. high. *Leaves* linear to linear-oblong, entire usually acute, nearly sessile, 9-20 (-30) mm. long and 1-2.5 (-5) mm. wide; thick, but not usually bullate as in the var. *ornatus* with the stout midrib and the lateral nerves impressed above and prominent below, covered (as are peduncles, bracts, pedicels, calyx and midpetaline zones) with the same brownish or greyish tomentum as the stems. *Peduncles* ascending, 1-flowered, very rarely some 2-flowered, shorter than the leaves and up to about 10 mm. long; bracteoles small, linear or subulate, about 3 mm. long; pedicels usually longer than the peduncles and up to about 15 mm. long. *Calyx* about 6 (-10) mm. long; sepals oblong or ovate, acute or somewhat acuminate, rarely obtuse, the outer ones completely covered with the tomentum on the outside, inner ones with a median hairy zone. *Corolla* white with a dark reddish-purple “eye”, widely funnel-shaped, about 15 (-20) mm. long and the limb 20 (-25) mm. in diam. *Capsule* ovoid-conical, shortly apiculate, hairy at the apex, 5-6 mm. long and about 5 mm. in diam. *Seeds* glabrous.

TRANSVAAL.—Prob. Potchefstroom (“Hills near Mooi River”): *Zeyher* 1322 (BOL). “Magaliesberg”: *Burke* 119 (PRE). Pretoria, Irene: *Leendertz* 669 (PRE), *Pole-Evans* s.n. (PRE). Quagga's Poort: *Verdoorn* s.n. (PRE).

SOUTHERA RHODESIA.—Gwelo: *Rand* 274 (Photograph of type of *C. randii* ex BM in PRE); *Walters* h. no. 2433, in herb. Fyles sub no. 3469 (SRGH). Lalapansi: *Ingle* 1 (SRGH).

The specimen *Burke* 119 is somewhat different in that the leaves are bullate and the sepals are obtuse. In *Verdoorn* s.n. the sepals are obtuse or acute. These two specimens form a transition to the var. *ornatus*, which cannot be very sharply distinguished from the var. *ocellatus*.

Convolvulus randii is somewhat more robust, with longer and wider leaves than the Transvaal specimens, and has occasionally 2-flowered peduncles, but it cannot be more than a somewhat luxuriant form of *C. ocellatus*.

The types of *C. ocellatus* (i.e. the plate in Bot. Mag. t. 4065), *C. ornatus* (Marloth 716) and *C. dinteri* (Dinter 812) are very different in appearance. *C. ocellatus* (and *C. randii*) are erect, suffruticose with linear leaves, usually without a trace of basal auricles, usually distinct peduncles, acute sepals and rather large flowers which (always?) have a purplish-red centre. *C. ornatus* is usually prostrate to ascending, with linear-oblong or hastate to palmately 5-fid leaves with revolute edges. *C. dinteri* is intermediate in several respects but sometimes distinctly climbing. The best solution is to treat these very closely related forms as two varieties of *C. ocellatus*, including *C. dinteri* in the var. *ornatus*.

The extreme forms are so different that they resemble several other species. Typical "*C. ornatus*" sometimes resembles *C. multifidus* and *C. boedeckerianus*; typical "*C. dinteri*" resembles certain forms of *C. sagittatus* (but is much more hairy). For the difference between "*C. ornatus*", *C. multifidus* and *C. boedeckerianus*, see under *C. multifidus*.

- 3b. *C. ocellatus* Hook. f. var. **ornatus** (Engl.) A. Meeuse, stat. nov. *C. ornatus* Engl. in Engl. Bot. Jb. 10 (1888), p. 247; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 76. *C. multifidus* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 102 non Thunb. (1794). *C. dinteri* Pilger in Engl. Bot. Jb. 45 (1910), p. 219; Dinter in Feddes Repert. 16 (1919), p. 240.

Type: Marloth 716 (originally in B. now destroyed; duplicate-neotype in PRE).

Perennial, covered with a sericeo-tomentose, usual velvety-brown, fawn or drab, more rarely white pubescence, producing several to many annual stems from a woody rootstock. *Stems* prostrate, ascending to suberect, often sinuous and occasionally climbing at the ends; the suberect ones short, prostrate and climbing ones up to about 40 cm. long, terete, often suffruticose. *Leaves* varying from linear-oblong with hastate or sagittate base to palmately 5-fid or linear with bifid basal auricles, very rarely linear or oblong with narrow base, usually rather thick with distinctly revolute edges and the nerves much impressed above, prominent below, hence leaves often appearing sub-bullate or plicate; linear-oblong ones 10–25 mm. long and 2–4 (–8) mm. wide, shortly and abruptly acuminate or obtuse, basal lobes often bifid, often gradually changing on the same plant to the palmately 5-fid leaves of which the central lobe is always the longest; the lobes entire to crenate or more or less wavy at the margins because the nerves are strongly impressed; lobes 1–4 mm. wide, obtuse or acute, the basal ones often narrower than the central one, with more strongly revolute edges; occasionally leaves flat, up to 15 mm. wide at the base and with somewhat pinnately lobed or toothed lobes; petioles 0.3– (–5) mm. long, those of digitately compound leaves generally longer but rarely attaining 10 mm. *Peduncles* 0 or rarely up to 2 (–5) mm. long; bracteoles subulate or linear, up to about 5 mm. long but often shorter and minute; pedicels 3–10 mm. long. *Calyx* 6–8 mm. long, densely tomentose to sublanate; sepals ovate, ovate-lanceolate or elliptic to oblong, usually from an elliptic or ovate basal part abruptly narrowing into a linear-oblong, obtuse apical portion, sometimes gradually narrowed into an obtuse, acute or somewhat acuminate or minutely awned apex. *Corolla* 12–14 mm. long, white, pink or pale mauve, the limb 12–14 mm. in diam., 5-angled with usually acute points, densely hairy on the midpetaline areas. *Capsule* globose-ovoid, 5–7 mm. in diam., 6–8 mm. long, apiculate, glabrous when mature. *Seeds* dark brown, glabrous, smooth.

TRANSVAAL.—Lichtenburg: Sutton 416 (PRE). Bloemhof/Christiana: Burt-Davy 11380 (PRE, NBG), 11858, 14347 (PRE).

CAPE PROVINCE.—Vryburg: Rogers H. no. 26975 (SAM), Burt-Davy 11127 (PRE), 14674 (PRE, SAM); Lear (or Phear) H. no. 25032 (BOL); Henrici 28, 53 (PRE). Barkly West: Wilman h. no. 2995 (KMG); Lawson h. no. 25033 (BOL), Acocks 1461, 17853 (PRE). Kimberley: Marloth 716 (PRE, isotype of *C. ornatus*

Engl.); *Moran* 77 (GRA)=prob. H. no. 476 (KMG)=H. no. 52259 (SAM); *Acocks and Hafström* H780 (PRE); *Esterhuysen* 1288 (BOL); *Henderson* 86 (KMG). Warrenton: *Adams* 204 (GRA). Kuruman: *Burchell* 2412 (PRE); *Silk* 215 (BOL, SAM). Hay: *Aucamp* H. n. 477 (KMG); *Wilman* H. no. 1321, 3091 (KMG); *Louw* s.n. (PRE). Prieska: *Acocks and Hafström* H. 1120 (PRE).

ORANGE FREE STATE.—Bloemfontein: *Grist* H. no. 7286 (PRE); *Marais* 195 (PRE).

S.W. AFRICA.—Aukas, Kraaifontein: *Dinter* 812 (SAM, PRE, isotypes of *C. dinteri* Pilger)—Grootfontein: *Schoenfelder* S 403, S 404 (PRE).

4. *C. boedeckerianus* *Peter* in Engl. and Prantl, *Natürl. Pfl. fam. Ed. 1, 4-3A* (1891), p. 36, nomen subnudum; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 102, descr. latina; Baker & Wright in Dyer, *Fl. Cap.* 4,2 (1904), p. 76.

Type: Peter's original description is very short and he did not mention any specimens at all. A good description was only given by Hallier, who quoted several specimens. On account of its specific name, the specimen leg. Boedecker from the Orange Free State, cited by Hallier, must be considered to be the type (in herb. Göttingen, according to Hallier). I have not seen the type specimen, but have examined specimens which had been compared with the specimens in the Kew herbarium collected by Shaw and one of which was quoted by Hallier.

Perennial, forming several woody stems from the crown of a long woody taproot, covered on stems, young parts, leaves, petioles, pedicels, bracteoles and calyx with adpressed, usually golden-brown or fulvous, more rarely silvery-white, hairs. *Stems* slender, prostrate or occasionally twining at the ends, rarely suberect, terete, usually finely silky, glabrescent or sometimes nearly glabrous, up to about 60 cm. long (suberect ones up to 20 cm.). *Leaves* usually pinnately to subpalmately 5-lobed, the lower ones often ovate or oblong, coarsely dentate to pinnatilobed, gradually changing upwards into the divided, more typical leaves, 10-35 mm. long, only in exceptional cases up to 60 mm. long; middle lobe of the blade usually distinctly the largest, often irregularly toothed or pinnatilobed to pinnatisect, rarely quite entire; basal lobes (auricles) usually bifid; lateral lobes usually linear, entire or slightly toothed, sometimes pinnatilobed; pubescence usually rather sparse to glabrescent, rarely almost completely disappearing in older ones; petioles 1-5 (-8) mm. long. *Flowers* solitary; peduncles usually wanting, rarely developed, if present, very short; bracteoles subulate, minute; pedicels 2-6 (-10) mm. long, somewhat elongating and glabrescent in fruit. *Calyx* 4-6 mm. long, tomentose to laxly hairy but never quite glabrous; sepals subequal, ovate, acute, 2-3 mm. wide. *Corolla* white, pale pink or pale pinkish mauve, 7-10 mm. long, the limb 9-12 mm. in diam., 5-angled with acute triangular lobes; midpetaline areas silky-pubescent outside. *Capsule* glabrous, globose or ovoid-globose, apiculate, straw-coloured, 5-7 mm. long and in diam. *Seeds* dark brown, when ripe distinctly verrucose-rugose or somewhat muriculate, about 4 mm. long.

Endemic but may extend into Bechuanaland Protectorate.

CAPE PROVINCE.—Hay: *Wilman* s.n. (GRA)=prob. H. no. 2241 (KMG); *Acocks and Hafström* H. 1044 (PRE); *Hafström* H 1042 (PRE). Barkly West: *Bowker* 593 (GRA); *Pagan* H. no. 473 p.p. (KMG, mixed with *C. multifidus*); betw. Barkly West and Kimberley: *Bolus* 6837 (BOL). Kimberley: *Marloth* 880 (PRE); *Tyson* s.n. (SAM); *Moran* 47, 60 (GRA) H. no. 480 (KMG), H. no. 15895 (BOL); *Elliot* H. no. 472 p.p. (KMG, mixed with *C. multifidus*); *Wilman* H. no. 15843 (BOL); *Lewis* H. no. 54142 (SAM); *Brueckner* 600 (PRE). Herbert: *Wilman* h. no. 475 (KMG). "KaaP Plateau", Griqualand West: *Hafström* H 1239 (PRE). Middelburg: *Verdoorn* 1530 (PRE). Queenstown: *Galpin* 2343 (PRE).

TRANSVAAL.—Bloemhof: *Tardrew* s.n. (PRE, SAM); *Louw* 1976 (PRE).

ORANGE FREE STATE.—Kroonstad: *Pont* 240 (PRE). Winburg: *Prosser* 1529 (J). Bloemfontein: *Flanagan* 2112 (PRE, GRA); *Bolus* 8217 (BOL); *Marais* 31 (PRE); *Potgieter* 43 B (PRE). Fauresmith: *Henrici* s.n., 1875, 1877, 2558, 2662 (PRE); *Smith* 3926, 4606 (PRE); *Marais* 493, 506 (PRE); *Verdoorn* 978 (PRE). “nr. Caledon River”: *Burke* 189 (PRE, SAM); “between Bethulie, O.F.S. and Aliwal North, C.P.”: *Thorne* h. no. 51870 (SAM).

C. boedeckerianus is usually rendered quite distinct by its hairy calyx, small corolla, obsolete peduncles and solitary flowers. The hairy calyx distinguishes it from *C. dregeanus* which is very similar in habit but quite glabrous; the absence of peduncles and the usually distinctly dissected or pinnatifid leaves distinguish it from depauperate 1-flowered specimens of *C. ulosepalus* (which has distinct peduncles and usually linear, auricled leaves). It is closely related to *C. multifidus* and for the differences between *C. boedeckerianus*, *C. ocellatus* (*C. ornatus*) and *C. multifidus*, see under the latter.

The specimens of *Burchell* 1839 I have seen are referable to *C. multifidus*, in my opinion, and not to *C. boedeckerianus* as was done in Fl. Cap. This gathering has been quoted by Hallier under “*C. thunbergii* R. et S.” (evidently on account of Choisy’s treatment in Prodr. 9; however, Choisy quotes “*Burchell* 1836” under this name). For the various interpretations of “*C. thunbergii*”, see under the latter.

5. *C. multifidus* *Thunb.*, Prodr. Pl. Cap. (1794), p. 35, and in Fl. Cap Ed. Schult. (1820), p. 170; Choisy in DC., Prodr. 9 (1845), p. 410 excl. spec. *Burchell* 2412; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 76. *C. thunbergii* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 102, non R. et S.

Type: A specimen collected by *Thunberg* nr. Loeri River, Uitenhage, in herb. Thunberg in Uppsala (photograph of type in PRE).

Perennial forming annual stems from a woody rootstock. *Stems* few to many, suberect to prostrate, herbaceous but firm, suffruticose at the base, slender, terete, covered, like all young vegetative parts, pedicels, bracteoles and alyces, with a dense villous, tomentose to somewhat silky pubescence, 15–75 cm. long. *Leaves* palmately 5-fid with at least the central lobe irregularly pinnatifid or pinnatisect and the basal lobes hastate and bifid, ovate or oblong in outline, 5–25 (–35) mm. long; ultimate segments always narrow, usually under 2 mm. wide, often with revolute edges or somewhat concave; upper surface somewhat glabrescent, lower surface persistently densely hairy, tomentose or villous; petioles short, up to about 1 cm. long in the largest leaves. *Peduncles* 1-flowered, up to 1 cm. long, sometimes 0; bracteoles small, linear-subulate; pedicels longer than the peduncles, up to 15 mm., gradually becoming a little thicker upwards. *Sepals* broadly ovate, outer ones 5.5–7 mm. long, often somewhat thinner and crisped along the edges, obtuse or acute; inner ones usually shorter, relatively broader, membranous-coriaceous, glabrous or nearly so except at the apices, innermost mucronate to apiculate. *Corolla* funnelshaped, very pale pink or white, 10–12 mm. long and 12–15 mm. in diam.; the lobes rounded to obtuse, midpetaline areas densely silky. *Capsule* subglobose or ovoid-globose, apiculate, glabrous, about 5 mm. in diam. *Seeds* very dark brown or black, glabrous, somewhat longitudinally rugose on the back, verrucose-muriculate on the angles.

Endemic.

CAPE PROVINCE.—Uitenhage, nr. Loeri River: *Thunberg* (photograph of type in PRE), id. Grasrug: *Baur* 1020 (SAM). Herbert, Mazelsfontein: *Anderson* 602 (GRA, PRE); *Wilman* s.n. (PRE); *Victor* H. no. 481 (KMG). Hay: *Wilman* H. nos. 2242, 7102 (KMG); *Esterhuysen* 4077 (BOL, KMG); prob. Hay (“between upper Campbell and Griquatown”): *Burchell* 1839 (BOL, GRA, L; in Fl. Cap. referred to *C. boedeckerianus!*). Kimberley: *Levey* in herb. Galpin 6332 (PRE); *Elliott* H. no. 472,

p.p. (mixed *C. boedeckerianus*, KMG); *Wilman* s.n. (BOL, h. no. 15843; SAM, h. no. 26794). Barkly West: *Brueckner* 150 (PRE); *Pagan* H. no. 473, p.p. (mixed with *C. boedeckerianus*, KMG). Vryburg: *Henrici* 168 (PRE); *Burt-Davy* 14675 (PRE, NBG); without precise locality, but most probably Kimberley: *Marloth* 8417 (PRE).

ORANGE FREE STATE.—Bloemfontein: *Marais* 96 (PRE).

This species has frequently been misinterpreted. Choisy, l.c., referred *Burchell* 2412 to this species, but *Burchell* 2412 belongs to *C. ocellatus*. Hallier at first confused *C. multifidus* with *C. ornatus* Engl. (= *C. ocellatus*) and with "*C. thunbergii*", but later he was able to study the type specimen and annotated: "*Convolvulus multifidus* Thunb.! 1818—*C. capensi* Burm. arcte affinis et forsan mera varietas, a Choisy in DC., Prodr. IX p. 410 false cum *Burchell* 2412, a me in Engl. Jahrb. XVIII p. 102 false cum *Conv. ornato* Engl. conjuncta. 19—III—1909".

The type, of which a photograph was kindly sent by Mr. Alm of the Uppsala herbarium, enabled me to identify specimens referable to this species. I cannot agree with Hallier, however, that it is very closely related to *C. capensis*. It is much more closely related to *C. boedeckerianus* and forms of *C. ocellatus* (*C. ornatus*) and in some specimens the differences are only very slight, but it is always possible to separate them as follows:—

| | <i>C. multifidus</i> Thunb. | <i>C. ocellatus</i> Hook. (<i>C. ornatus</i> Engl.). | <i>C. boedeckerianus</i> Peter. |
|-------------------|---|--|---|
| Pubescence..... | Usually silvery-white, tomentose, more rarely brownish | Usually brownish or fawn and tomentose, tomentum sometimes subulate | Usually not so dense (not tomentose), and golden-brown, sometimes glabrescent. |
| Leaves..... | Deeply dissected; lobes narrow, nerves \pm prominent below, leaves not plicate or subulate, but the prominent nerves may suggest a plicate appearance | Various, from linear or lanceolate with sagittate or hastate base to palmately 5-lobed; lobes usually not so narrow, frequently with revolute edges, nerves much impressed above and prominent beneath and generally subulate or plicate | Various, but usually \pm dissected to pinnately or palmately 5 (-7)-lobed mostly flat and herbaceous; edges not revolute; leaves not subulate or plicate. |
| Peduncles..... | Short or rather long (up to \pm 20 mm. long), rarely 0 | Usually 0, rarely present (up to \pm 5 mm. long) | 0, very rarely present. |
| Calyx (in flower) | 6-8 mm. long, usually tomentose; sepals broadly ovate or obovate to almost rhomboid not with narrow \pm linear apical portion, 4 mm. wide or wider | 6-8 mm. long, tomentose-lanate; sepals elliptic to oblong or lanceolate, narrowed to the apex or rather abruptly narrowed into a linear or linear-subulate apical portion, obtuse or mucronate, \pm 3 mm. wide | 4-6 mm. long, covered with golden-brown hairs, tomentose or laxly hairy, sepals ovate, acute, 2-3 mm. wide. |
| Corolla..... | 14-16 mm. long rarely only 12 mm. long, lobes of limb usually rounded or obtuse, limb usually \pm 18 mm., rarely only \pm 14 mm. in diam. | 12-14 mm. long, lobes of limb usually acute, limb 12-14 mm. in diam. | 8-10 mm. long, lobes of limb usually acute, limb 10-12 mm. in diam. |

6. *C. aschersonii* Engl., Hochsgeb. fl. Trop. Afr. p. 349 (1892). *C. penicellatus*, Hall. f. in Engl. Bot. Jb. 18 (1893), p. 103, non A. Rich. *C. sagittatus* var. *australis* subvar. *abyssinicus* ("abyssinica") Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 533. *C. sagittatus* var. *abyssinicus* ("abyssinica") (Hall. f.) Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 96.

Type: *Schimper* 660 from Abyssinia in B (now destroyed).

Perennial forming annual prostrate or sometimes twining stems from a woody taproot. *Stems* terete, herbaceous, but firm, densely covered (as are all vegetative parts, peduncles, bracteoles, pedicels and outer sepals) with a fulvous or silvery-white pubescence, up to about 2 m. long. *Leaves* variable in shape, often on the same plant, but generally oblong to lanceolate-oblong, varying to linear-hastate or ovate, usually hastate at the base with the basal auricles lobed or dissected and the central lobe irregularly crenate-repand-pinnatilobed, not infrequently with two small oblong lateral lobes at the base and leaf subpalmately 5-7-lobed, sometimes pinnatisect, 3-6 cm. long and 0.5-2.5 (-3.5) cm. wide; pubescence usually strigose on upper surface, less adpressed on lower one; the apex usually obtuse to rounded, emarginate and minutely reflexed-mucronate, rarely acute; main nerves and midrib impressed above, prominent below, petioles usually rather stout, terete, 5-20 mm. long. *Peduncles* usually longer than the petioles shorter or longer than the subtending leaf, slender, terete, subumbellately to cymosely 1-6-flowered, bracteoles linear or oblanceolate, 3-4 mm. long; pedicels short. *Sepals* unequal, outer ones herbaceous, oblong, elliptic or ovate-oblong, hairy and ciliate, obtuse or acute, sometimes crisped along the margins, 6-7 mm. long; inner ones blabrous or gradually less hairy to glabrous except at the tips, membranous to thinly coriaceous, marcescent, shorter, much broader (innermost broadly ovate to suborbicular, about 4 mm. long), much imbricate. *Corolla* funnel-shaped, white or very pale mauve-pink, sometimes with mauvish markings in the throat, 7-10 mm. long and about as much in diam., midpetaline areas pale greenish outside, silky towards the apex and terminating in a beard of hairs. *Stamens* with a few short, rounded papillae near the base. *Capsule* globose, apiculate, glabrous, 6-7 mm. in diam. *Seeds* very dark brown, very finely verrucose-rugose, not distinctly so along the angles, 3-4 mm. long.

From Eritrea and Abyssinia to East Africa, extends into Angola, Bechuanaland, Southern Rhodesia and Transvaal.

ANGOLA.—Ambaca: *Welwitsch* 6204 (COI, K).

TRANSVAAL.—Brits, near Wolhuterskop: *Meeuse* 9274 (PRE); Pretoria, near Pretoria: *Leendertz* 552 (PRE), *Moss* 4720 (J), *Thode* A440 (PRE); Hammanskraal: *Hutchinson* 2895 (BOL, GRA, PRE); Potgietersrust: *Galpin* s.n. 9038 (PRE); Pietersburg, nr. Pietersburg: *Meeuse* 9191, 9237 (PRE), Woodbush: *Wager* s.n. (PRE), Blaauwberg: *Codd* 8732 (PRE).

S. RHODESIA.—Bulawayo: *Eyles & Johnson* 54 (GRA); *Rogers* 5754 (BOL); *Kolbe* 4018 (BOL). Matopos: *Kolbe* 4345 (BOL). Plumtree: *McCosh* 13 (SRGH). Gwelo: *Kolbe* 4283 (BOL), *Eyles* 1820 (PRE, SAM, SRGH). M'Sonedi: *Hopkins* H. no. 6762 (SRGH). Enkeldoorn: *Eyles* 8960 (SRGH). Gwebi: *Baines* 18 (SRGH). Marandellas: *Corby* 496 (SRGH, PRE), *Dehn* 189 (SRGH). Salisbury: *Kolbe* 4270 (BOL), *Hopkins* H. no. 7828 (SRGH, PRE), *Blenkinson* in herb. Moss no. 14811 (J), *Young* 109 (PRE), s.n. in herb. Moss 18497 (J), *Morris* 288, 303 (NBG). "Premier Mine" *Moss* 18497 (J).

ERITREA.—Acrou: *Schweinfurth & Riva* 1061 (K). Saganeiti: *Schweinfurth & Riva* 1739 (K).

This species was reduced to a variety of *C. sagittatus* by Hallier and in Fl. Trop. Afr., but I am of the opinion that it is a distinct species, much more closely related to *C. ulosepalus* Hall. f. than to *C. sagittatus*. The type was not seen, but other numbers cited in Fl. Trop. Afr. agree with material from Southern Africa. *C. aschersonii* can be distinguished from *C. sagittatus* by its usually few-flowered inflorescences (the flowers are usually solitary in the latter), small flowers (8–10 mm. long) and different leaf-shape (middle-lobe up to 6 cm. long and 12 mm. wide, often crenate or sinuate, occasionally dissected; basal lobes often toothed or multifid). These characters do not occur together in *C. sagittatus*. From *C. ulosepalus* it is distinct by its depressed short silky pubescence on both surfaces of the leaf (*C. ulosepalus* is never so densely hairy) and by the sepals which are not so unequal as in *C. ulosepalus*.

The specimens from tropical Africa and Eritrea quoted by Hallier and in Fl. Trop. Afr. vary in the shape and size of the leaves, length of peduncles, etc. Some of the South African and Rhodesian specimens match some of these quoted specimens: Hopkins h. no. 7828, Galpin s.n. (Potgietersrust), Wager s.n. (Woodbush) are excellent matches of Schweinfurth & Riva 1061, and Eyles 1820, Meeuse 9151, 9237 of Schweinfurth & Riva 1739.

7. ***Convolvulus ulosepalus* Hall. f.** in Engl. Bot. Jb. 18 (1893), p. 103; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 73; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 95; Salter in Adams. and Salter, Fl. Cape Penins. (1950), p. 685. *C. rhynchophyllus* Baker & Engl. in Engl. Bot. Jb. 10 (1888), p. 247, nomen tantum; Hall f. in Engl. Bot. Jb. 18 (1898), p. 104 (name only) and in Bull. Herb. Boiss. 6 (1898), p. 534, descr. latina.

Type: Not designated, because Hallier mentioned several specimens (some of which I was able to examine).

Perennial, forming several to many annual stems, from a woody taproot. *Stems* prostrate or climbing, herbaceous, slender, attaining a length of 1–2 m. or sometimes more, when young hairy or nearly glabrous, when old glabrescent or completely glabrous. *Leaves* 2–10 cm. long and 3–10 (–35) mm. wide, hastate or somewhat sagittate with a linear to linear-lanceolate or oblong central lobe and entire or bifid basal lobes, rarely leaves palmately 5-lobed with a large median lobe, much smaller patent lateral lobes and hastate, often angular, toothed or bifid basal lobes; central lobe usually entire to somewhat repand or crenate occasionally irregularly serrate or lacerate, usually obtuse and mucronate, both surfaces of older leaves thinly hairy or glabrous; petioles hairy like the stems, 5–20 (–30) mm. long. *Peduncles* 2–6 (–8)-flowered, on young stems and depauperate specimens sometimes 1-flowered, usually much longer than the petioles, terete, slender, hairy like the stems and petioles, bracteoles, linear, linear-lanceolate or -oblanceolate, hairy, 3–6 mm. long; pedicels short. *Sepals* unequal, outer ones herbaceous, often purplish towards the tips, ovate, elliptic or ovate-lanceolate, acute, pubescent outside, 5–6 mm. long; inner ones shorter, glabrous or nearly so, marcescent to coriaceous, suborbicular, abruptly mucronate. *Corolla* white or pale pink, funnel-shaped, 7–9 mm. long; and 9–12 in diam.; lobes acute, midpetaline areas hairy at the tips. *Stamens* without hairs or papillae at the base. *Capsule* globose, apiculate, glabrous, 5–7 mm. in diam. *Seeds* dark brown to almost black, glabrous, nearly smooth, very minutely and indistinctly verrucose, rugose or punctate, 2.5–3.5 mm. long.

South Africa, wide-spread, extends into Southern Angola and Bechuanaland.

Recorded from.—South West Africa (wide-spread, except in the driest regions); Cape Province (from the Cape Peninsula eastwards, also Wittebergen and Laingsburg, throughout central Cape and Griqualand West as far east as Queenstown and Albany, Orange Free State (wide-spread); Basutoland; Natal (only recorded from Newcastle,

Weenen and "Upper Tugela"); Transvaal (Marico, Zeerust, Christiana, Wolmaransstad, Klerksdorp, Potchefstroom, Vereeniging, Johannesburg, Brits, Pretoria, Lydenburg, Carolina, Ermelo, Standerton, Barberton).

Some interesting specimens are the following: *Drège* 741a (Mooiplaats, prob. Albert Div., in L); *Tyson* 124 (Murraysburg; in SAM, NH); *Bolus* 252 (Graaff-Reinet, in BOL, GRA, PRE, SAM); *Baur* 901 (PRE, SAM; according to the label in PRE, Hallier (1893) and Fl. Cap. collected at Shiloh, Queenstown, but according to the label in SAM from Baziya, Transkei; the first locality is most probably correct); *Marloth* 979 (from Boetsap, Barkly W., in PRE); *Cooper* 547 (PRE, from Beaufort East). All these were referred to *C. rhynchophyllus* by Hallier (1893, 1898). *Drège* 741e (L, from Beaufort-West), *Drège* 7829a (L, from Richmond), these two were among the original numbers cited by Hallier under *C. ulosepalus*.

The oldest name is *C. rhynchophyllus* Baker ex Engl., but this name remained a nomen nudum till 1898 when it was validated by Hallier by a latin description. The name *C. ulosepalus* Hall. f. (1893), therefore must be retained, because *C. ulosepalus* and *C. rhynchophyllus* cannot be separated. The oldest specimen of this species is found in herb. Thunberg. Thunberg named it "*C. sagittatus* 2". Hallier annotated this specimen: "*Convolvulus ulosepalus* Hall. f. 1893. Non *Convolvulus sagittatus* Thunb. Fl. Cap." The specimen "*C. sagittatus* 1" in the Thunberg herbarium agrees with Thunberg's description and with the conceptions of other authors of *C. sagittatus*, and is to be taken as the lecto-type of the latter.

Sometimes the leaves of *C. ulosepalus* are considerably wider than in "typical" specimens and they resemble those of some forms of *C. farinosus* L. with dissected leaves. *C. ulosepalus* can be distinguished by the rotundate inner calyx lobes, the non-papillose anthers and the smaller flowers (8-10 mm. against 12-15 mm. in *C. farinosus*). *C. ulosepalus* differs from *C. sagittatus* in the usually distinctly bifid basal lobes of the leaf (mostly not or slightly lobed in *C. sagittatus*), the 2-6-flowered inflorescences, the smaller flowers and the rotundate inner calyx-lobes. For the distinction between *C. ulosepalus* and *C. aschersonii*, see under the latter. Depauperate specimens may resemble *C. boedeckerianus*, but differ from the latter in the leaf-shape, peduncled flowers and the shape of the sepals. *C. ulosepalus* not infrequently becomes a noxious weed which is difficult to eradicate on account of its perennial rootstock.

8. *C. sagittatus* Thunb., Prodr. Pl. Cap. (1794), p. 35; Choisy in DC., Prodr. 9 (1845), p. 407; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 103 and in Bull. Herb. Boiss. 6 (1898), p. 533; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 72; Baker & Rendle in Dyer Fl. Trop. Afr. 4, 2 (1905), p. 96, pro parte (exclus. var. *abyssinicus*). *C. hastatus* Thunb. var. *natalensis* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 72.

Type: A specimen in the Thunberg Herbarium, Uppsala (photographs in PRE). There are two sheets on which Thunberg has written "*Convolvulus sagittatus*", the one is marked "1" and agrees with Thunberg's description of *C. sagittatus*, the second sheet, marked "2" is *Convolvulus ulosepalus* Hall. f. Hallier annotated the second specimen in 1909: "*Convolvulus ulosepalus* Hall. f. 1893. Non *Convolvulus sagittatus* Thunb. Fl. Cap." As Thunberg's description agrees with the specimen "1" and not with the specimen "2", "1" must be taken as the lecto-type.

Perennial, forming several annual stems from a long thin perennial taproot. *Stems* usually only branched from the base, slender, prostrate or occasionally in some forms climbing, usually hairy, usually under 60 cm. long but in some forms attaining 1-2 m. *Leaves* varying from linear or linear-sagittate to hastate-sagittate or oblong with truncate base, usually entire except the basal lobes, usually somewhat hairy, sometimes densely so or nearly to quite glabrous; petioles usually very short and often hairy. *Peduncles* 1-flowered or in some forms few-flowered, usually terete, slender,

up to 4 cm. long, often hairy; bracteoles small, pedicels short or occasionally up to 3 cm. long. *Calyx* usually hairy, sepals varying from lanceolate to orbicular, acute to obtuse, sometimes mucronate or ciliate. *Corolla* funnel-shaped, white or sometimes pale pink or mauve-pink, midpetaline areas hairy near the tips. *Capsule* subglobose, glabrous. *Seeds* usually 4, dark brown or black, glabrous, when ripe, somewhat tuberculate-rugose.

Wide-spread in South Africa, in addition Eritrea, Abyssinia and East Africa; extends into Northern and Southern Rhodesia and Angola, also in Arabia and probably also in Madagascar.

As regards the taxonomic subdivision of *C. sagittatus* the following division, mainly based on Hallier's publication in Bull. Herb. Boiss. 6 (1898). p. 533-534, is presented:—

Corolla 8-12 mm. long, sometimes up to 15-18 mm. long..... subsp. *sagittatus*.

Corolla 15-20 mm. long..... subsp. *grandiflorus*.

The subspecies *sagittatus* can be divided as follows:—

Leaves linear-sagittate with entire, rounded or rarely bi-lobed basal auricles; peduncles usually 1-flowered and usually under 3 cm. long; sepals ovate or broadly ovate, acute, hairy to nearly glabrous; plants thinly hairy to nearly glabrous with adpressed hairs; stems prostrate, rarely climbing..... var. *sagittatus*.

Leaves sagittate or oblong-sagittate or somewhat hastate, up to 3 cm. long and 10-15 mm. wide; basal auricles entire, peduncles 1-flowered, under 2 cm. long; sepals subspathulate, elliptic or obovate, obtuse, mucronate, with crisped margin, usually quite glabrous; plants usually densely and shortly pubescent on stems and petioles; stems prostrate..... var. *phyllosepalus*.

Leaves lanceolate- or linear-hastate, up to 4 cm. long, narrow but measured across the entire, bifid or 2-3 toothed basal auricles up to about 20 mm. wide; peduncles few-flowered or 1-flowered, short or sometimes up to 4 cm. long; sepals broadly elliptic to suborbicular, abruptly apiculate, acute, subhirsute; plants thinly to rather densely covered with rather short stiff (subhirsute) hairs; stems prostrate..... var. *hirtellus*.

Leaves linear-sagittate with cordate or hastate-sagittate base and bifid basal lobes which are entire or dentate; peduncles few-flowered, 5-5.5 mm. long; sepals ovate or elliptic, acuminate; whole plant farinose and thinly sericeous; stems usually climbing..... var. *namaquensis*.

The subspecies *grandiflorus* can be divided as follows:—

Leaves hastate-subcordate to oblong with truncate base, up to about 3 cm. long and 2 cm. wide, rarely longer and narrower; peduncles 1-flowered, usually under 3 cm. long; sepals lanceolate to elliptic or ovate, acute or cuspidate, hairy; plants usually prostrate to suberect..... var. *grandiflorus* (var. *subcordatus*).

Leaves linear, up to 4 cm. long and 2-3 mm. wide; peduncles usually 1-flowered, up to 4 cm. long; pedicels 2-3 mm. long; sepals ovate-lanceolate, acuminate, subglabrous, plants usually prostrate..... var. *graminifolius*.

Leaves linear with 2 (often minute) auricles at the base, up to 7 cm. long and 4 mm. wide; peduncles usually 1-flowered, up to about 2 cm. long; pedicels about as long as the peduncles; sepals ovate-lanceolate or ovate, thinly silky outside, glabrescent or occasionally tomentose, plants often climbing..... var. *linearifolius*.

Not included are *C. sagittatus* var. *parviflorus* Hall. f. subvar. *villosus* Hall. f., op cit., p. 533 from E. Africa = *Convolvulus thompsoni* Baker in Kew Bull. 1894, p. 67, which I have not seen (it may be a depauperated form of the following), and the subvar. *abyssinicus* Hall. f. l. c., which is *Convolvulus aschersonii* and must be excluded.

8 a. *C. sagittatus* ssp. *sagittatus*. *C. sagittatus* var. *parviflorus* Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 533.

8 a. 1. *C. sagittatus* ssp. *sagittatus* var. *sagittatus*. *C. sagittatus* var. *parviflorus* Hall. f. subvar. *australis* Hall. f., l. c.

The following specimens I refer to the var. *sagittatus*:—

CAPE PROVINCE.—“Karoo”: *Thunberg* (photograph of type in PRE). “Blaauwpan, Karoo” (= ? Blouput, Prince Albert): *Moss* 17985 (J). Uitenhage: *Ecklon & Zeyher* 2·9 (L). Somerset E., Cookhouse: *Kensit* in herb. Bolus no. 9316 (BOL). Graaff Reinett, Ripplemead: *Hutton* 464 (GRA), 514 (BOL). Albert, Burghersdorp: *Pocock* 99 (GRA). Queenstown: *Cooper* 266 (PRE); *Galpin* 2009 (PRE). Sterkstroom: *Sim* 4108 (GRA), this specimen forms a transition to the forma *graminifolia*. Albany, near Grahamstown: *McOwan* 950 (GRA, SAM); *Sole* s.n. (GRA); *Lotsy & Goddijn* (L); *Martin* 698 (NBG). Bathurst, Trappe’s Valley: *Daly* 671 p.p. (GRA); 671 (BOL). Kentani or Willowvale: *Drège* s.n. (L). Willowvale: *Drège* s.n. (L).

ORANGE FREE STATE.—Fauresmith: *Henrici* 1963 (PRE). Bloemfontein: *Mostert* 651 (PRE), *Gemmell* 4973 (PRE). Heilbron, Coalbrook: *Gilmore* 2129 (PRE).

BASUTOLAND.—Leribe: *Dieterlen* 97b (PRE, NH, SAM).

CAPE PROVINCE.—Griqualand-W., Kimberley: *Moran* s.n. (BOL).

NATAL.—Estcourt: *Schlechter* 3362 (BOL, GRA, PRE); *West* 341 (PRE); *Acocks* 10552 (PRE). Winterton, Grantleigh: *King* 10 (PRE). Colenso: *Wood* s.n. (SAM). Weenen: *Acocks* 10696 (PRE, NH). “Upper Tugela”: *Wood* 3430 (HN). Pietermaritzburg: *Killick & Marais* 1998 (PRE). Vryheid: *v.d. Merwe* 2452 (PRE).

TRANSVAAL.—Potchefstroom: *Louw* 1032 (PRE). Vereeniging: *Leendertz* H. no. 10818 (PRE). Witbank, Zondagsfontein: *Thode* A2842 (NH, PRE). Without precise locality: *Stainbank* in Herb. Wood no. 3650 (NH).

BECHUANALAND.—*Schoenfelder* S 178 (PRE); *Munro* ML8 (PRE).

The specimens *Gilmore* 2129, *Dieterlen* 97b, *Schlechter* 3362, *West* 341, *Acocks* 10552, 10696, *Wood* 3430, *van der Merwe* 2452, *Killick & Marais* 1998, *Leendertz* H. no. 10818, *Thode* A 2842 and *Stainbank* in h. Wood 3650 form a transition to the forma *phyllosepalus*; the specimens *Henrici* 1963, *Smith* 5169 and *Pagan* s.n. to the forma *hirtellus*; the specimens *v.d. Merwe* 2452 and *Galpin* 2029 to the ssp. *grandifolius* var. *linearifolius*.

The following specimens from tropical Africa are, in my opinion, indistinguishable from typical var. *sagittatus*, although there seems to be a gap in the distribution:

NYASALAND, Lake Nyasa: *Galpin* 15019; N. RHODESIA, Mazabuka: *CRS* 395, 470; KENYA, Nairobi: *Verdcourt* 368 (all PRE).

8. a. 2. *C. sagittatus* ssp. *sagittatus* var. *phyllosepalus* (Hall. f.) *A. Meeuse*, nov. stat. *C. phyllosepalus* Hall. f., op. cit., p. 535; Baker & Wright, op. cit., p. 75. *C. sagittatus*, var. *latifolius* C. H. Wright in Dyer, Fl. Cap. 4, 2 (1905), p. 72.

Type of var.: Hallier mentioned three specimens in herb. Zürich viz. *Rehmann* 3796, 4131 and 4674. These specimens were kindly sent on loan by the Zürich herbarium and proved to be identical with Wright’s “var. *latifolius*” of which original specimens had been compared with material of the National Herbarium, Pretoria. One of Rehmann’s numbers (no. 3796) bears a label “Typus”. It is not known if Hallier was responsible for this typification; at any rate. I propose *Rehmann* 3796 (in Z) as the lecto-type of this variety.

Occurs in the Orange Free State and the Transvaal, with intermediate forms in Natal (see under var. *sagittatus*).

ORANGE FREE STATE.—Bethlehem, Clarens: *Van Hoepen* s.n. (PRE). Harrismith, Witzieshoek: *Junod* s.n. (PRE). Kroonstad: *Pont* 36 (PRE). Ventersburg: *Acocks* 12501 (PRE). Bloemfontein: *Rehmann* 3796 (herb. Zurich). Glen: *Glen School of Agr.* s.n. (PRE).

TRANSVAAL.—Wolmaransstad: *Sutton* 86 (PRE). Marico, Zeerust: *Pott* s.n. (PRE). Potchefstroom: *Theron* 1053 (PRE, NH); *Liebenberg & Phillips* B.L. 938, 949, 971A (PRE). Johannesburg: *Bryant* D31, 207 = D38 (PRE); *Moss* 10572 (J). Springs, Geduld: *Moss* 15610, 15611 (J). Heidelberg, Suikerbosrand: *Schlechter* 3484 (BOL, GRA, PRE). Pretoria, Pretoria: *Rehmann* 4131, 4674 (Z); *Leendertz* s.n. (PRE); *Goosens* 15 (PRE); *Moss* 9633 (J); *Liebenberg* 3399 (PRE); *Mogg* 15245 (PRE); *Meeuse* 9030 (PRE); *Makkink* s.n. (PRE); *Comins* 859 (PRE). Irene: *Burt-Davy* 2316 (BOL). Bronkhorstspuit: *Rogers* s.n. (PRE). Bethal: *Leendertz* s.n. (PRE). Standerton: *Jenkins* s.n. (PRE); this specimen is somewhat intermediate between the var. *phyllosepalus* and the var. *hirtellus*, *Moss* 17651 (J).

8. a. 3. *C. sagittatus* ssp. *sagittatus* var. *hirtellus* (*Hall. f.*) *A. Meeuse*, stat. nov. *C. hirtellus* Hall. f., op. cit., p. 536.

Type of var.: Hallier mentioned two specimens, viz. *Burke* s.n. (K) and *Rehmann* 3848 (Z). The Burke specimen was kindly sent on loan by the Kew herbarium and enabled me to identify Hallier's species. I propose Burke's specimen as the lecto-type of the variety.

Occurs in the Northern Cape Province, Orange Free State, Basutoland and Transvaal Highveld.

CAPE PROVINCE.—Aliwal North: *Gerstner* 253 (PRE); this specimen is intermediate towards the var. *sagittatus*.

ORANGE FREE STATE.—Bloemfontein: *Moraile* 500 (PRE). Kroonstad: *Pont* 383 (PRE); without precise locality, near Vaal River; *Burke* s.n. (herb. Kew).

BASUTOLAND.—Mokhotlong: *Liebenberg* 5820 (PRE).

TRANSVAAL.—Potchefstroom: *v.d. Westhuizen* 269 (PRE). Benoni: *Moss* 14131 (J). Pretoria: *Burt-Davy* 44 (PRE). Nigel, between Devon and Leslie: *Dyer & Verdoorn* s.n. (PRE). Heidelberg: *Codd* 8508 (PRE). Bethal: *Leendertz* s.n. (PRE). Ermelo: *Leendertz* s.n. (PRE); *Henrici* 1682 (PRE); this specimen is somewhat approaching the var. *sagittatus*.

8. a. 4. *C. sagittatus* ssp. *sagittatus* var. *namaquensis* *A. Meeuse*, var. nov. *Convolvulus namaquensis* Schltr. ms. on Schlechter 11124. Tota planta farinosa et sparse sericea. *Folia* lineari-sagittata, basi cordata vel hastata-sagittata, lobi basales bifida, dentata vel integra. *Pedunculi* pauciflori, 5–55 mm. longi. *Sepala* ovata vel elliptica, acuminata. *Corolla* 14–18 mm. longa.

Type of var.: Schlechter 11124 in PRE (iso types in BOL, GRA, L). This form is mainly found in Namaqualand, but also in Laingsburg and a very similar plant, which is however, more densely silky-pubescent, was collected in the Ceres district.

CAPE PROVINCE.—Little Namaqualand, Brakdam: *Schlechter* 11124 (BOL, GRA, PRE); *Pillans* 5605 (BOL); Spektakel: *Bolus* 9423 (BOL); *W. Morris* in herb. Bolus n. 25040 (BOL); *Khamiesberg: Esterhuysen* 1301 (BOL); Laingsburg, Kl. Roggeveld, Schietfontein: *Compton* 8121 (NBG). A very hairy form which in other respects agrees with this form was collected in the Cape Province, Worcester, Brandvlei (*Barker* 7512 in NBG).

8. b. *C. sagittatus* subsp. *grandiflorus* (Hall. f.) A. Meeuse, stat. nov. *C. sagittatus* var. *grandiflorus* Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 533.

Type of subspecies: Not designated.

8. b. 1. *C. sagittatus* ssp. *grandiflorus* var. *grandiflorus*. *C. sagittatus* ssp. *grandiflorus* var. *subcordata* (Hall. f.) Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 97. *C. steudneri* Engl., Hochgeb.-fl. Trop. Afr. (1892), p. 350; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 104. *C. angolensis* Baker in Kew Bull. 1894, p. 67; Baker & Rendle op. cit., p. 95. *Ipomoea huillensis* Baker op. cit., p. 70. *Convolvulus sagittatus* var. *grandiflorus* subvar. *subcordata* Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 534. *C. huillensis* (Baker) Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 97.

Type: Not designated.

Recorded from Abyssinia and Arabia, also in Angola and South West Africa.

SOUTH WEST AFRICA.—Dinter 696 (SAM). Auros, Otavi: Dinter 5614 (BOL, SAM, PRE).

ANGOLA.—Welwitsch 6131 (isotype of *C. huillensis*, COI).

ABYSSINIA.—Addis Abeba road: McLoughlin s.n. (PRE).

8. b. 2. *C. sagittatus* ssp. *grandiflorus* var. *graminifolius* (Hall. f.) Baker & Wright, op. cit., p. 72. *C. sagittatus* var. *grandiflorus* subvar. *graminifolia* Hall. f., op. cit. (1898), p. 534.

Type of var.: Rehmann 7823 (herb. Zurich).

Endemic.

TRANSVAAL.—Johannesburg, Modderfontein: Haagner s.n. (GRA).

NATAL.—Camperdown: Rehmann 7823 (Z).

This variety may have to be united with the var. *linearifolius*.

8. b. 3. *C. sagittatus* ssp. *grandiflorus* var. *linearifolius* (Hall. f.) Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 72; Baker & Rendle op. cit., 97 *C. sagittatus* var. *grandiflorus* subvar. *linearifolia* Hall. f., op. cit. (1898), p. 534.

Type of var.: Galpin 1037 (herb. Zürich).

Recorded from South Africa, Angola, Rhodesia.

CAPE PROVINCE.—Umtata: Schönland 3787 (GRA). Baziya: Baur 350 (GRA, SAM). Umzimkulu, Clydesdale: Tyson 2135 (BOL, SAM).

TRANSVAAL.—Belfast, Machadodorp: Galpin 13223 (PRE, BOL). Barberton, Barberton: Galpin 1037 (PRE, BOL, GRA, NH, SAM, Z), Kaapsche Hoop: Prosser 1474 (PRE, J). Pietersburg, Frischgewacht: Leendertz 829 (PRE, BOL).

ANGOLA.—Baum 180 (COI).

S. RHODESIA.—Inyanga: Eyles 8473 (SRGH; a very hairy form, calyx densely tomentose).

A variable species, or a species complex. Several more or less distinct forms can be distinguished, but there is not a single good criterion to separate them with certainty. I prefer to follow Hallier's broad concept of the species, but include *C. phyllosepalus* and *C. hirtellus* and exclude *C. penicillatus* A. Rich., which is, in my opinion, a distinct species much more closely related to *C. ulosepalus*.

C. phyllosepalus was described as having broad (hastate-sagittate) leaves and foliaceous, obtuse, mucronate, crisped, glabrous or subglabrous sepals, but intermediate forms occur with narrower leaves and pubescent sepals (as in typical *C. sagittatus*), with broad leaves and pubescent sepals and with narrow leaves and glabrous sepals. *C. hirtellus* Hall. f. is a form in which the pubescence is more hirsute and the basal auricles of the leaves are 2-3-lobed; it was described as being always 1-flowered, but intermediate forms occur which link this form with typical *C. sagittatus*, and also specimens are found with *C. hirtellus* characters, but with 2-3-flowered inflorescences.

The forms with larger flowers (var. *grandiflorus*) are sometimes quite different in appearance from typical *C. sagittatus*, but if the variation in leaf-shape (from linear-sagittate to cordate-ovate-sagittate) and in pubescence is not considered to be essential they only differ from typical *C. sagittatus* in the size of the corolla and this character is not quite constant either.

Some specimens collected in S.W. Africa are similar to those described as *C. angolensis* and *C. huillensis* from Angola. In Namaqualand, farinose specimens with few-flowered inflorescences are found. Although farinose vegetative parts and several-flowered inflorescences are also occasionally found in specimens collected elsewhere, the Namaqualand form appears to be worthy of varietal rank.

C. sagittatus can usually be distinguished from the other African species of *Convolvulus*, but sometimes one-flowered specimens of *C. bidentatus* and depauperate specimens of *C. ulosepalus* and *C. farinosus* may closely resemble forms of *C. sagittatus*. *C. bidentatus* has a different type of calyx, usually a long peduncle, large flowers, and the basal lobes of the leaves bi-fid, and this combination of characters is sufficient for a clear distinction (apart from its different distribution).

C. ulosepalus and *C. farinosus* can usually be distinguished by their different leaf-shape, the long peduncle and, in the case of *C. ulosepalus*, the sepals, which are much more unequal than in *C. sagittatus*.

C. aschersonii can be distinguished from *C. sagittatus* by a combination of characters: the strigose, dense pubescence, few-flowered inflorescences, small flowers and the often toothed or multifid basal lobes of the leaves never occur together in *C. sagittatus*.

A form of *C. ocellatus*, described as *C. dinteri* Pilger, also resembles certain forms of *C. sagittatus*, but the tomentum of *C. ocellatus* on the vegetative parts and the sepals distinguishes it from *C. sagittatus*.

9. *C. farinosus* L., Mant. (1771), p. 203; Choisy in DC., Prodr. 9 (1845), p. 412; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 104; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 74; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 98; Salter in Adams. and Salter, Fl. Cape Penins. (1950), p. 685. *C. cordifolius* Thunb., Prodr. Fl. Cap. (1794), p. 35; Choisy, op. cit., p. 413. *C. penicellatus* A. Rich., Tent. Fl. Abyss. 2 (1851), p. 74.

Type: Most probably the specimen in the Linnean herbarium which is proposed here as the lecto-type.

Herbaceous perennial. Stems many, long, weak, slender, climbing and usually branched, pubescent or farinose-puberulous, the younger shoots often silvery. Leaves usually cordate-deltoid or sagittate, acute with terminal mucro, rarely obtuse, subentire to irregularly and shallowly crenate, herbaceous drying membranous, glabrous above except when young, glabrous or more or less pubescent beneath, distinctly netted-veined; basal sinus broad, basal auricles rounded or pointed, sometimes with a few

teeth; very rarely leaves with additional triangular lobes above the basal auricles; length of blade 4-9 (-12) cm., width 3-7 (-9) cm.; petiole about half as long as the blade, finely and densely pubescent. *Peduncles* usually about as long as, or longer than the subtending petioles, finely pubescent, subumbellately 1-4 (-6)-flowered; bracts minute, linear or lanceolate, pubescent; pedicels short. *Sepals* unequal, oblong or elliptic (outer ones) to suborbicular (inner ones), much imbricate, acute or obtuse with terminal mucro, 6-8 mm. long; two outer ones more or less pubescent, three inner ones gradually less pubescent to nearly glabrous and wider. *Corolla* funnel-shaped, white, very pale pink or very pale pinkish mauve, 12-15 mm. long; the lobes short, the tube rather narrow; midpetaline areas hairy towards the obtuse, mucronate tips of the lobes. *Stamens* bearing short thick lateral papillae in their dilated basal portions; anthers a dirty purple. *Ovary* glabrous. *Capsule* subglobose, shortly apiculate, glabrous, 5-8 mm. in diam. *Seeds* usually 4, blackish when ripe, scabridulous-rugose.

Western Mediterranean area, tropical and subtropical E. Africa, S. Africa, Mascarene Islands.

In S. Africa it is not found in the more arid regions (S.W. Africa, Griqualand-W., Orange Free State and W. Transvaal).

Recorded from the CAPE PROVINCE: From the Cape Peninsula and Ceres along the coast, in the Eastern Cape Province also more inland (Albany, Fort Beaufort, Keiskamma Hoek); NATAL and ZULULAND (wide-spread); SWAZILAND; TRANSVAAL: Pretoria, Bethal, Pietersburg, Zoutpansberg, Letaba, Nelspruit, Barberton; PORTUGUESE E. AFRICA (Lourenço Marques). I have seen only one specimen from S. Rhodesia (nr. E. border, Chirinda: *Wild* 2151 in SRGH) and one from Ngamiland, Bechuanaland (*Curson* 6 in PRE).

Some interesting specimens are the following: *Drège* 7830 (between Zuurberg and Klein Bruintjeshoogte, Somerset E., in L), and *Drège* "*C. cordifolius*" Th. a", prob. from King William's Town (L) quoted by Choisy and by Hallier.

The usually cordate-deltoid or sagittate, sharply acute and mucronate, often more or less crenate leaves, the rather long, 1-6-flowered inflorescences and rather small (12-15 mm. long) flowers characterize this species. However, forms with dissected leaves are sometimes very similar to some forms of *C. ulosepalus*. For their distinction, see under the latter.

Dr. B. Verdcourt of the East African Herbarium (Nairobi) kindly pointed out that the type of *C. penicellatus* A. Rich. which he studied (in P) is undoubtedly *C. farinosus* L. Hallier treated Richard's name as a synonym of *C. aschersonii* (see no. 6) and he was followed in *Flora of Tropical Africa* 4, 2 (1905), p. 96.

10. *C. bidentatus* Bernh. apud *Krauss* in *Flora* 27 (1844), p. 829; Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 105, in syn. *C. hastatus* Thunb., *Prodr. Fl. Cap.* 1 (1794), p. 35, and in *Fl. Cap.* 2 (1818), p. 17; Choisy in DC., *Prodr.* 9 (1845), p. 407, ex parte; Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 105; Baker & Wright in *Dyer, Fl. Cap.* 4, 2 (1904), p. 72, exclus. var. *natalensis* Baker, non *C. hastatus* Forsk. (1775), nec Desr. (1789).

Type: Originally the specimen *Krauss* s.n. from George in B, now destroyed; if no duplicates of the *Krauss* gathering are extant (not one could be traced), I propose Thunberg's specimen in the Thunberg herbarium provisionally as the neotype.

Probably a *perennial*. *Stems* several from the base of the taproot, slender (basal parts up to about 3 mm. thick), prostrate or climbing at the ends, up to about 3 m.

long, usually somewhat quadrangular, glabrous or sometimes pubescent. *Leaves* narrowly hastate to linear with hastate base, up to 45 (occasionally 70) mm. long and the middle lobe 1–6 (–8) mm. wide; glabrous or pubescent, the basal lobes up to 25 mm. long, usually deeply bi-fid; the apex usually obtuse, mucronate; the margin entire, lowermost leaves if present sometimes broader, oblong or sagittate-oblong or occasionally palmately 5–7 lobed with the middle lobe the longest, up to 15 mm. wide. *Peduncles* almost invariably 2-flowered, more rarely 1-flowered or cymosely 3–5-flowered, 3–8 (–14) cm. long, rarely shorter, pubescent or glabrous; bracts lanceolate, 3–5 mm. long; pedicels short, pubescent, usually somewhat 4-angled and subclavate, 5–10 (–15) mm. long. *Calyx* 6–8 mm. long, glabrous or very rarely obscurely pubescent; sepals broadly ovate or obovate, rather chartaceous with membranous edges, much imbricate, obtuse to rounded and often more or less mucronate at the apex. *Corolla* (15–) 20–22 mm. long, white or pale pink; midpetaline areas slightly hairy near the apex outside. *Capsule* globose, glabrous, about 6 mm. in diam., almost completely enclosed in the calyx. *Seeds* black, minutely rugose and subpuberulous with tufts of very minute brown hairs.

CAPE PROVINCE.—Bredasdorp, between Bredasdorp and Malagas: *Esterhuysen* 4339a (BOL). Riversdale, Still Bay: *Muir* 3537 (PRE). Knysna: *Breyer* s.n. (PRE), *Duthie* 913 (BOL), *Fourcade* 1571, 6304 (BOL). Uitenhage, Zwartkopsrivier: *Zeyher* 239 (BOL. PRE), *Ecklon & Zeyher* 13 (SAM), *Brehm* 126 (SAM), locality illegible: *Brehm* 339 (SAM), nr. Uitenhage: *Marais* 155 (PRE). Pt. Elizabeth: *Holland* 3757 (BOL), *Laidley* 115 (L), *Long* 822 (GRA, PRE), *Williamson* 64 (GRA), Redhouse: *Paterson* 1088 (GRA), s.n. (PRE). Alexandria: *Archibald* 4517/17 (GRA, PRE), 4820b (GRA), *Johnson* 1105 (GRA, PRE). Albany, Alicedale: *Cruden* 137 (GRA), Trappe's Valley: *Daly* 671 p.p. (GRA), "Lower Albany": *Bowker* s.n. (PRE). Bathurst, Kowie: *Britten* 712 (GRA). E. London, N. mouth of the Buffalo River: *Murray* 100 (SAM); Cape, without precise locality: *Thunberg* (photograph of proposed neotype in PRE); "Regio orientallis": *Alexander* s.n. (PRE).

The name *Convolvulus hastatus* cannot be used for this species on account of *C. hastatus* Forsk. and *C. hastatus* Desr. [= *C. arvensis* L. and *Merremia tridentata* (L.) Hall. f. ssp. *hastatus* Ooststr., respectively]. The only other specific epithet available is *bidentatus*. Unfortunately the Krauss specimen on which this name is based, and which was evidently the holotype, must have been destroyed. However, it is evident from Hallier's treatment of this species (1893), from the other specimens he quoted and from some specimens which were annotated by Hallier himself, and were available for study, that his conception of the species *C. bidentatus* Bernh. is limited to the specimens agreeing with the type of *C. hastatus* Thunb., so that I have no doubt that *C. bidentatus* Bernh. and *C. hastatus* Thunb. are synonyms and retain the first name for this species.

Stranger is Hallier's distinction of a var. *major* ("Flores dupla magnitudine, 2 cm. longi"), because the flowers in Thunberg's type and in most specimens I have seen are about 2 cm. long. The inclusion of the var. *major* in the species in *Flora Capensis* was, therefore, quite correct.

As Hallier pointed out, Thunberg's short diagnosis is quite sufficient to characterise the species: "*Folia hastata, lobi laterales bifidi; pedunculi raro uniflori, saepius biflori; calyx glaber*". Hallier added that the broad, rounded to emarginate brown, pale-edged, much imbricate sepals form a very good distinctive character. In spite of all this, the species was not properly understood in the treatment in *Fl. Cap.*, because several specimens referred to *C. hastatus* in the *Fl. Cap.* do not belong here, such as those included in the var. *natalensis* (= *C. sagittatus*!), the Transvaal specimens, and the gathering *Leipoldt* 321 (= *C. capensis*!) from Clanwilliam.

Some specimens of *C. sagittatus* resemble *C. bidentatus*, but these two species differ in several characters and there is always at least one character (either pubescence of calyx, shape of sepals and/or leaves) to distinguish them. Also some forms of *C. capensis* may resemble *C. bidentatus*, but they are usually hairy on the calyx, have mostly larger flowers with more densely hairy midpetaline areas, and but rarely a similar leaf-shape.

11. *C. galpinii* C. H. Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 75.

Type: *Galpin* 2110 from Queenstown (K).

Probably a *perennial*; whole plant densely villous or tomentose with fulvous or grey short hairs. *Stems* prostrate or twining, slender, terete, 60 cm. long. *Leaves* sagittate-deltoid to deltoid-cordate or ovate-cordate, 2–4 cm. long, usually somewhat irregularly crenate-serrate, usually acute, basal sinus wide; basal lobes often somewhat toothed or with angular small lobes; petioles up to about 12 mm. long. *Peduncles* 1–2-flowered, slender, terete, up to 6 cm. long. bracteoles linear, 5–8 mm. long; pedicels up to about 1 cm. long. *Calyx* 6–10 mm. long; outer sepals ovate, abruptly acuminate, villous, inner ones shorter and relatively broader, ovate-orbicular, less hairy. *Corolla* funnel-shaped, white, 16–20 mm. long and as much or a little more in diam.; midpetaline areas densely silky. *Capsule* subglobose, glabrous, apiculate, 6–8 mm. in diam. *Seeds* dark brown, 4–5 mm. long, subpuberulous with fine, yellowish brown rugosities of the testa.

Endemic.

CAPE PROVINCE.—Queenstown, Queenstown: *Galpin* 2110 (PRE, GRA, BOL, isotypes!). Stutterheim: *Leighton* H. no. 26651 (BOL); Evelyn Valley: *Compton* 19246 (NBG). King William's Town, Mt. Coke: *Compton* 17001 (NBG). E. London: *Hilner* 277 (GRA). Albany, Grahamstown, Collingham: *Britten* 6511 (GRA), Atherstone: *Rogers* s.n. (GRA). Tarka, Fairfield, Great Winterberg: *Acocks* 17637 (PRE). Mt. Ayliff, Insizwa Mts.: *Schlechter* 6469 (GRA).

This species is closely related to *C. natalensis* Bernh. apud Krauss and may be only a form or variety of the latter, but the specimens I have seen can be separated from *C. natalensis* by their abruptly acuminate and shorter sepals, smaller corollas, more slender, often twining stems and usually smaller, often more or less sagittate or deltoid-cordate leaves [*C. natalensis* has usually prostrate, robust stems, lanceolate to ovate-lanceolate, not abruptly acuminate sepals which are (10–) 12–20 mm. long against 6–10 mm. in *C. galpinii*, a corolla which is (18–) 20–32 mm. long against 16–20 mm. in *C. galpinii*]. In addition, the seeds of *C. galpinii* are puberulous, whereas those of *C. natalensis* are finely tuberculate-rugose, glabrous, but this character cannot be used to separate specimens without seeds.

12. *C. natalensis* Bernh. apud Krauss in Flora 27 (1844), p. 829: Hall. f. in Engl. Bot. Jb. 18 (1893), p. 105; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 77. *C. calycinus* E. Mey. ex Drège, Zw. pfl.geogr. Doc. (1838), p. 154, nomen tantum. *C. calycinus* E. Mey. ex Choisy in DC., Prodr. 9 (1845), p. 408, non Roxb., nec. H.B.K.; Hall. f., op. cit. p. 105; Baker & Wright, op. cit., p. 77. *C. transvaalensis* Schltr. in Jl. Bot. 34 (1896), p. 402. *C. bullerianus* Rendle in Jl. Bot. 39 (1901), p. 62; Baker & Wright, op. cit., p. 77.

Type: *Krauss* 465 from Natal, "Table Mountain" near Pietermaritzburg (originally in B?; isotype in BOL).

Endemic.

Two varieties can be distinguished.

12a. *C. natalensis* var. *natalensis*. *C. calycinus* E. Mey. ex Choisy, non Roxb. *C. natalensis* var. *integrifolia* C. H. Wright in Fl. Cap. 4, 2 (1904), p. 77.

Perennial forming prostrate or occasionally somewhat twining annual stems from a woody taproot. *Stems* usually rather stout and firm, terete, up to 1 m. long, covered, as are all vegetative parts, peduncles, pedicels, bracteoles and calyces with rather short hairs which are sometimes stiff and hirsutulous, sometimes silky and sometimes somewhat woolly, fawn, rusty-brown to silvery-white, more densely so in all the younger parts, at length glabrescent. *Leaves* cordate-ovate, cordate-oblong or sometimes cordate or narrowly reniform, 1–5 (–8) cm. long and 0.75–3 (–4) cm. wide, usually undissected with an undulate, crenate or somewhat dentate or serrate to subentire margin but sometimes faintly, rarely distinctly and irregularly pinnatilobed; the apex usually broadly rounded and shortly cuspidate, sometimes obtuse or acute, the basal sinus broad and shallow, the basal auricles often somewhat angular; petioles 5–10 (–20) mm. long. *Peduncles* 1- to few-flowered, terete, short (up to 7 cm. long), occasionally 0; bracteoles linear or lanceolate, 6–10 mm. long, often more than 2 when inflorescence few-flowered; pedicels very short or up to 15 mm. long. *Calyx* 10–15 (–18) mm. long; sepals ovate-lanceolate, oblong, elliptic or lanceolate, more or less unequal; the outer ones herbaceous, sometimes subcordate at the base, broader and crisped along the margins; inner ones a little shorter and less pubescent to glabrous, somewhat marcescent, sometimes broadly ovate; all sepals obtuse to acute, the inner usually more acute than the outer ones. *Corolla* white, cream-coloured or white tinged with green, funnel-shaped, 20–35 mm. long and 22–40 mm. in diam.; midpetaline areas greenish, densely silky with rusty-brown, fawn or silvery-white hairs. *Capsule* sub-globose, or somewhat ovoid, apiculate, glabrous, 8–10 mm. long and in diam. *Seeds* dark brown, glabrous, distinctly verrucose-rugose, 5–6 mm. long.

CAPE PROVINCE.—Bathurst, near Pt. Alfred: *Burchell* 4040 (L). East London: *Galpin* 7346 (PRE); *Rattray* 588 (GRA). Kei Mouth (Komgha–Kentani): *Flanagan* 1812 (BOL, PRE, SAM). Kentani: *Pegler* 213 (BOL, PRE, SAM). Umzimkulu, Clydesdale: *Tyson* 2170 (BOL, SAM); *Drège* s.n. (isotype of *C. calycinus* E. Mey. ex Choisy, L).

BASUTOLAND.—*Cooper* 929 (BOL).

NATAL.—Port Shepstone, Pt. Edward: *Huntley* 888 (NU, PRE). Ixopo, Maxwell: *Evans* 272 (NH). Durban: *Mogg* 11018 (PRE). Pine Town, Umbogintwini: *Wylie* s.n. (NH, PRE), Gillits: *Wood* s.n. (SAM). Impendhle: *Levett* 97 (NH). Inanda: *Wood* 288 (BOL, NH). Pietermaritzburg: *Compton* 23736 (NBG); *Huntley* 275 (NU, PRE); *Mogg* 2181, 2224 (PRE); Table Mountain: *Krauss* 465 (isotype, BOL), near Allerton: *Mogg* 2181 (PRE). Lion's River, Tweedie: *Pegler* in h. *Wood* 11026 (NH, PRE); Torwood, Rosetta: *Young* s.n. (NH); Balgowan: *Mogg* 3548, 3844 (PRE). Estcourt: *Wood* 3462 (NH, BOL). Dalton Bridge: *Acocks* 10568 (NH), 10624 (NH). Winterton: *Reyburn* s.n. (NH). Greytown, Rietvlei, Greenwich Farm: *Frey* in herb. Galpin no. 2730 (PRE). Eshowe: *Lawn* 1090, 1217 (NH). Entumeni: *Forbes* 795 (NH). “Zululand”: *Gerrard* 1331 (PRE). “W. Zululand”: *Baker* in herb. Evans no. 561 (NH). Nqutu: *Codd* 7655 (PRE). Newcastle: *Wood* 5979 (PRE). Charles-town: *Wood* 4702 (PRE).

TRANSVAAL.—Wakkerstroom: *Galpin* 9818 (PRE); *Beeton* 240 (SAM). Ermelo, Goede Hoop: *Pott* s.n. (PRE). S.E. Transvaal: “Inter Delagoa Bay et Drakensbergen, Transvaal”: *Bolus* 9710 (BOL). Lydenburg: *Obermeyer* 320 (PRE), Pietersburg, Haenertsburg: *Pott* 4713 (PRE); Woodbush: *Jenkins* s.n. (PRE). Of these, the following numbers are more or less intermediate between the forma *natalensis* and forma *transvaalensis*: *Huntley* 275, *Mogg* 2181, 2224, 3548, *Jenkins* s.n.

12b. *C. natalensis* var. *transvaalensis* (Schltr.) A. Meeuse, stat. nov. *C. transvaalensis* Schltr. in Jl. Bot. 34 (1896), p. 402. *C. bullerianus* Rendle in Jl. Bot. 39 (1901), p. 62. *C. natalensis* var. *angustifolia* C. H. Wright, l.c.

Leaves linear with hastate base to oblong, or long-triangular with cordate to sagittate or hastate, sometimes truncate or rounded base, entire or pinnatilobed, rarely pinnately-palmately dissected, 3–6 (–9) cm. long and 0.2–2 (in some forms up to 5) cm. wide. *Sepals* more often acute and lanceolate, otherwise as the var. *natalensis*.

CAPE PROVINCE.—Cathcart: Thomas River, *Barker* 3494 (NBG). McLearn: *Britten* 4527 (GRA). Mt. Currie, Vaalbank near Kokstad: *Haygarth* in herb. Wood no. 4179 (BOL, NH).

NATAL.—Pietermaritzburg: *Fairall* 89 (NBG); Scottsville: *Allsopp* 404a, 900 (NU); Alexander Park: *Allsopp* 906 (NH, NU). Estcourt, Mooi River: *Wood* 4071 (BOL, NH, PRE), 6206 (isotype of *C. bullerianus* Rendle, PRE); Meteor Ridge: *Mogg* 3165 (PRE). Weenen, South Downs: *Wood* 4382 (NH). Utrecht, Kafir Drift: *Thode* A241 (NH, PRE); Tweekloof, Altemooi: *Thode* A1176 (NH, PRE).

SWAZILAND.—Hlatikulu: *Stewart* s.n. (PRE).

TRANSVAAL.—Barberton: *Galpin* 430 (isotypes of *C. transvaalensis* Schltr., BOL, GRA, PRE); *Williamson* 77 (PRE); *Edwards* in herb. Moss no. 10182 (J); *Codd* 8131 (PRE). Nelspruit, White River: *Rogers* s.n. (PRE). Belfast, Draaikraal: *Codd* 8056 (PRE). Carolina: *Acocks* 13937 (PRE); *Burt-Davy* 7356 (NBG).

The oldest available name is *C. natalensis* Bernh., validly published by Krauss in 1844. The name *C. calycinus* was published with a description by Choisy in 1845, but apart from the evident priority of the name *C. natalensis*, the specific epithet “*calycinus*” had already been used twice before in *Convolvulus*, viz. by Roxburgh and by H.B. et K. (see under *Ipomoea sinensis* on p. 729). The differences between *C. natalensis* and *C. calycinus* E. Mey., as indicated in Fl. Cap., break down altogether, so that it is not necessary to find another name for the latter. *C. transvaalensis* Schltr. was altogether overlooked in Fl. Cap. (the type of this species—*Galpin* 430—is quoted under *C. natalensis* var. *angustifolia* C. H. Wright). *C. bullerianus* Rendle is inseparable from Wright’s var. *angustifolia* of *C. natalensis*. I do not think the varieties mentioned in Fl. Cap. can be upheld, because they are based only on the shape of the leaves and more or less intermediate forms are found which link up the typical form (with ovate-cordate leaves) with the narrow-leaved var. *angustifolia* (= *C. transvaalensis* and *C. bullerianus*). They are treated here as varieties, but these are not sharply defined.

There is also considerable variation in the shape of the sepals which can be very broad, leafy and crisped on the edges to lanceolate; in the number of bracts (2–5); in the inflorescence (1- to few-flowered) and in the stamens (glandular at the base or eglandular).

The forms with narrow leaves sometimes resemble *C. thunbergii* very much and, in my opinion, *C. thunbergii* is indeed much more related to *C. natalensis* than to *C. capensis* (to which it was reduced as a variety in Fl. Cap.). They can be distinguished as follows:—

- (a) leaves often dissected in *C. thunbergii*, usually entire in *C. natalensis* (or only basal auricles dissected);
- (b) peduncles usually 1-flowered in *C. thunbergii*, 1- or more-flowered in *C. natalensis*;
- (c) bracts: 2 in *C. thunbergii*, 2–5 in *C. natalensis*;
- (d) corolla about 20 mm. long in *C. thunbergii*, usually 25–35 mm. in *C. natalensis*;
- (e) seeds black, smooth in *C. thunbergii*, brown and tuberculate-rugose in *C. natalensis*.

13. *C. thunbergii* R. et S., Syst. Veg. 4 (1818), p. 268, ex descr.; Drège, Zw. Pfl.geog. Doc. (1838), p. 46. *C. altheoides* Thunb., Prodr. Fl. Cap. (1794), p. 35, ex parte, non L. *C. capensis* Burm. f. var. *plicatus* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 78, non *Convolvulus plicatus* Desr.

Type: ? (see notes).

Perennial forming several prostrate annual stems from a thin woody rootstock. *Stems* slender or occasionally somewhat stout, herbaceous but firm, terete, covered with rusty-brown or fawn, rarely silvery-white short stiff hairs, up to about 70 cm. long. *Leaves* oblong in outline varying to lanceolate or ovate, cordate to hastate or truncate at the base, undivided and crenate to somewhat pinnatifid or usually palmately 5-lobed with the middle lobe the longest and all lobes crenate to pinnatifid or even bipinnatifid or whole leaf somewhat palmately bipinnatifid, ultimate lobes sometimes very fine; length of blade 2–5 cm., width 0.5–3 cm., the apex acute or occasionally obtuse; both surfaces thinly to densely covered with the same hairs as on the stems, especially on the nerves; petioles hairy like the stems, slender, up to 10 mm., rarely 18 mm. long. *Peduncles* 1-flowered, sometimes 2-flowered, slender, terete, hairy like the stems as are bractioles and pedicels, 1–4 cm. long; bractioles subulate or linear-subulate, 6–9 mm. long or sometimes minute, pedicels up to 12 mm., rarely to 15 mm. long. *Calyx* with short stiff hairs outside like the vegetative parts; sepals unequal, outer ones herbaceous to chartaceous, ovate, ovate-lanceolate or elliptic, acuminate, usually very acute, 8–12 (–15) mm. long; inner ones less hairy, distinctly shorter, suborbicular, somewhat marcescent. *Corolla* white or pale pink, funnel-shaped, 18–25 mm. long and 20–30 mm. in diam.; midpetaline areas greenish, hairy towards the apex outside and usually very densely so. *Capsule* subglobose, apiculate, glabrous, 7–9 mm. in diam. *Seeds* black, glabrous, very minutely punctate, about 5 mm. long.

Endemic.

CAPE PROVINCE.—Albert, Burghersdorp: *Cooper* 790, 1366 (BOL), Guthrie 4202, 4209 (NBG); *Pocock* 132 (GRA). Aliwal-N.: *Flanagan* 1507 (BOL, PRE, SAM); *Gerstner* 107 (PRE); *Jamestown* 2133 (NBG); Ruigtefontein: *Thode* A 1828 (NH, PRE); Elandshoek: *F. Bolus* 144 = L. Bolus no. 6847 (BOL). Barkly East: *Gerstner* 675 (PRE). Woodhouse, Dordrecht: *Acocks* 12532 (PRE). Graaff-Reinet: *Bolus* 230 (BOL). Queenstown: *Galpin* 2010 (PRE); Shiloh: *Drège* s.n. (“*C. thunbergii* a”, L), *Baur* 921 (SAM). Albany, Botha’s Hill: *McOwan* 586 (SAM). Mount Currie: *Goossens* 279 (PRE). Locality not known to me (Sterkstroom?): *Drège* s.n. “*C. thunbergii* b”, in L).

BASUTOLAND.—Leribe: *Dieterlen* 387 (GRA, NH, PRE, SAM); *Phillips* 966 (SAM). Berea Hills: *Guillarmod* 419 (PRE). Quacha’s Nek: *Houston* s.n. (NH). Drakensberg: *Stokoe* 1551 (PRE), Thaba Tsuen: *Page* s.n. (BOL).

ORANGE FREE STATE.—Zastron: *Maree* 89 (PRE). Ficksburg: *Galpin* 13955 (BOL, PRE); *Fawkes* 228 (NBG). Senekal: *Goossens* 882 (PRE). Bethlehem, Clarens: *Van Hoepen* s.n. (PRE). Harrismith, Witzieshoek: *Junod* s.n. (PRE).

TRANSVAAL.—Rustenburg: *Leendertz* s.n. (PRE); *Pegler* 949 (BOL, PRE); *Roe* in herb. Bolus no. 25035 (BOL). Marico, Zeerust, Rietfontein: *Riekert* s.n. (PRE). Krugersdorp: *Gilfillan* in herb. Galpin 6053 (PRE); Scheerpoort: *Obermeyer* s.n. (PRE). Lichtenburg: *Sutton* 316, 317 (PRE). Potchefstroom: *Louw* 1017 (PRE). Witwatersrand: *Moss* 7122, 16911, 19704 (J). Brits: *Pole Evans* s.n. (PRE). Johannesburg: *Tucker* s.n. (BOL); *Gilfillan* s.n. (PRE); *Moss* 13520 (J); Frankenswald: *Cohen* in herb. Moss no. 21212 (J); Florida: *Hutton* 627 (GRA, BOL). Pretoria: *Leendertz*

s.n.; *Verdoorn* 150; *Mogg* 14118, 14122, s.n.; *Smith* 6244; *Repton* 685; *Codd* 3064; *Burt-Davy* s.n.; *Meeuse* 9376; *Comins* 861 (all PRE); *Moss* 4719 (J); Onderstepoort: *Theiler* s.n. (PRE). Waterberg, Geelhoutkop: *Breyer* s.n. (PRE). Middelburg: *Schlechter* 3793 (BOL, GRA, PRE, NH). Belfast: *Schlechter* 3479 (BOL, GRA, PRE); *Galpin* 12456 (PRE). Heidelberg: *Leendertz* s.n. (PRE). Carolina: *Galpin* 3494 (PRE, BOL). "Transvaal": *Burt-Davy* 711 (NH).

N.B.—A specimen *Hutton* 438 labelled "Shafton, Howick, Natal" (GRA) is this species, but it is likely that it was wrongly labelled and was actually from the Johannesburg area—no other specimen was ever recorded from Natal.

This species is treated in the *Flora Capensis* as a variety of *C. capensis*, but it is not identical with *C. plicatus* Desr. This assumed identity was probably based on Choisy's identification (in DC., *Prodr.* 9, p. 410) of a Drège specimen ("*C. Thunbergii* a" from Shiloh) with Sonnerat's type specimen of *C. plicatus*. However, the Sonnerat specimen, which is in my opinion a form of *C. capensis* (see no. 14), does not agree at all with the Drège specimen "*C. Thunbergii* a" (in L) which I have studied.

The name "*Convolvulus Thunbergii*" was applied by Choisy to a specimen collected by Burchell (he cites "Burch.! cat. n. 1836", but this is most probably a mistake for no. 1839) and to a Drège specimen which is the type of *C. inconspicuus* Hall. f. (see under *C. capensis*). *Burchell* 1839 is referable to *C. multifidus* Thunb. (see no. 5).

The only plants to which the original description of *C. thunbergii* applies are those referred to "*C. capensis* var. *plicatus*" in *Fl. Cap.*, so that the first name is adopted. A type specimen could not be traced and Juel [in *Plantae Thunbergianae* (1918), p. 385] mentions that he could not find a plant in the Thunberg herbarium to which Roemer and Schultes referred when they cited one of his specimens.

The following interpretations of the name *Convolvulus thunbergii* have been given:—

- (a) E. Meyer applied it correctly to some Drège specimens, as is apparent from the names on the original labels.
- (b) Choisy used the name for specimens referable to *C. multifidus* and to "*C. inconspicuus*" (= *C. capensis*).
- (c) Hallier in *Engl. Bot. Jb.* 18 (1893), p. 102 followed Choisy and applied the name to *Burchell* 1839 (which is *C. multifidus*). Later he corrected this on a label on the type of *C. multifidus* Thunb. in the Thunberg herbarium (see under *C. multifidus*).
- (d) Baker and Wright in *Fl. Cap.* 4, 2, p. 78 placed it as a synonym under *C. capensis* var. *plicatus* which was due to a misinterpretation of *Convolvulus plicatus* Desr.

C. thunbergii is, in my opinion, much more closely related to *C. natalensis* than to *C. capensis*. For the differences between the first two, see under *C. natalensis*. From *C. capensis* it can be distinguished by the shape of the leaves (which are ovate to oblong in outline and pinnatisect or 5–9-lobed with the central lobe the longest, in *C. capensis* they are undivided or palmately lobed or dissected, or the middle lobe is linear or filiform), the smaller flowers (calyx 8–12 mm. long, corolla \pm 20 mm. long, in *C. capensis* usually calyx 7–12 mm. long and the corolla 20–40 mm.), the longer stigmas (very short in *C. capensis*) and the seeds (smooth in *C. thunbergii*, muriculate-tuberculate-rugose in *C. capensis*). In addition, *C. capensis* and *C. thunbergii* are almost completely geographically separated.

14. *C. capensis* *Burm. f.*, Prodr. Fl. Cap. (1768), p. 5; Choisy in DC., Prodr. 9 (1845), p. 410; Hall.f. in Engl. Bot. Jb. 18 (1893), p. 105; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 78, exclus. vars. β and γ . *C. plicatus* Desr. in Lamk., Encycl. 3 (1789), p. 558; Choisy, op. cit. p. 410; Hall.f., op. cit., p. 106. *C. alceifolius* Lamk., Encycl. Méthod., Bot. 1 (1791), p. 461; Choisy, op. cit., p. 410; Hall.f., op. cit., p. 105. *C. altheoides* Thunb., Prodr. Fl. Cap. (1794), p. 35 (pro parte?), non L. *C. falkia* Jacq., Hort. Schoenbr. 2 (1797), p. 38, t. 198; Choisy, l. c.; Hall.f., op. cit., p. 106, non Thunb. (1794). *C. filiformis* Thunb., Fl. Cap. Ed. 2 (1818), p. 16 and Ed. Schult. (1824), p. 168; Baker & Wright, op. cit., p. 71, non Desr. (1789). *C. inconspicuus* Hall.f., op. cit., p. 106, Baker & Wright, op. p. 71. *Merremia bowieana* Rendle in Jl. Bot. 39 (1901), p. 63. *Ipomoea bowieana* (Rendle) Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 52.

Type: In herb. Burman (G-Del.) without collector or precise locality (photo in PRE).

Endemic.

This variable species can be divided into three more or less distinct varieties, which are also more or less distinctly geographically separated:

- Leaves palmately dissected with the lobes oblong to linear, obtuse or sometimes acute, more or less equal or middle lobe longer, or the lower or all leaves undivided, cordate-oblong to cordate-reniform, obtuse or rounded at the apex with rounded basal lobes; sepals obtuse or acute; peduncles often long..... var. *capensis*.
- Leaves undissected to shallowly lobed or rarely dissected, triangular-cordate to almost sagittate, subacute to acuminate at the apex and with usually acute basal lobes; sepals acute to acuminate; peduncles usually short..... var. *plicatus*.
- Leaves, at least the upper ones, linear to filiform, hastate with much smaller lobes at the base or auricled, rarely without lobes or auricles; sepals obtuse, apiculate..... var. *bowieanus*.

- 14a. *C. capensis* var. *capensis*. *C. capensis* *Burm. f.*, *C. alceifolius* *Lamk.*, *C. capensis* α *dissectus* *Hall. f.*, op. cit., p. 105 and *C. capensis* β *malvacefolius* *Hall. f.*, op. cit., p. 106, *C. inconspicuus* *Hall. f.*

Perennial. Stems climbing or sometimes prostrate, herbaceous, occasionally suffruticose, ascending, slender, terete, up to at least 1.50 m. long, usually clothed (like leaves petiole and calyx) with brown pubescence, glabrescent, more rarely glabrous or nearly so (if so, leaves and petioles also less hairy). Leaves variable in shape on a single specimen, the lower (= older ones) narrowly reniform to cordate-oblong or almost hastate-oblong, rounded to subacute or emarginate at the apex, up to 35 mm. long, with subentire to repand, crenate or dentate margin; petioles 5 mm. long; upwards leaves becoming more and more pinnately incised or palmately 5-fid, the uppermost usually consisting of 5 linear lobes of which the central one is the longest; the lobes usually variously lobed or incised, the linear lobes of uppermost leaves less so to entire, length of blade (1-) 3-5 (-7) cm., width (0.5-) 2-3 (-4.5) cm.; petioles 0.5-2.5 (-4) cm. Peduncles 1- to cymosely few-flowered, usually slender, terete, less hairy than the stem or sometimes glabrous, often 4-10 cm. long, sometimes longer, rarely shorter (mainly in young or stunted specimens like those described as *C. inconspicuus* *Hall. f.*); bracteoles lanceolate, linear or subulate, minute or up to 8 mm. long, hairy; pedicels slender, usually more densely pubescent than the stems (25-) 15-5 mm. long. Calyx silky-villous outside, rarely nearly glabrous (6-) 8 (-10) mm. long; sepals broadly ovate to oblong, much imbricate, usually obtuse but often apiculate or mucronate, chartaceous (outer ones) to somewhat membranous (inner

ones). *Corolla* funnel-shaped, white inside and pale pink outside with greenish mid-petaline areas or pink to pale rose-colour, (15-) 20-30 (-35) mm. long and as much in diam., brownish-strigose on the midpetaline areas. *Ovary* glabrous. *Capsule* globose, glabrous, about 8 mm. in diam. *Seeds* dark brown, glabrous, verrucose, 4-5 mm. long.

CAPE PROVINCE.—Namaqualand, near Leliefontein: *Drège* (" *C. thunbergii* var"; isotypes of *C. inconspicuus* Hall. f., in L), near same locality: *Esterhuysen* 1370 (BOL, PRE); Khamiesbergen: *Esterhuysen* 736a (BOL). Van Rhynsdorp: *H. Andreae* 484 in herb. Marloth (PRE), *Acocks* 14813 (PRE). Calvinia: *Schmidt* 363 (PRE), *Story* 4302 (PRE), *Taylor* 2814, *Compton* 9802, *Maguire* 187 (all NBG). Clanwilliam: *Pappe* s.n. (SAM), *Leipoldt* 321 (BOL, SAM), *Galpin* 10544 (PRE), *Pillans* 9128 (BOL), *Thode* A 2045 (PRE, NH), *Esterhuysen* 7138 (BOL), *Gillett* 4013 (BOL), *Thorne* s.n. (SAM), *Schlechter* 10774 (BOL, GRA, L, PRE), *Weinroub* in herb. Moss 19490 (J), *Steyn* 389 (NBG), *Barker* 3615 (NBG, BOL); near Warmbad: *Pearson* 7252 (BOL). Piquetberg: *Bolus* 25027 (BOL), *Pillans* 8014 (BOL), *Compton* 9501, 15001, 15075, 15093 (NBG), 10904, 15025 (NBG, BOL), *Esterhuysen* 5520 (BOL), *Guthrie* 2663 (NBG), *Howes* 175 (PRE). Piquetberg/Clanwilliam, Grey Pass: *Steyn* 372 (NBG). Malmesbury: *Drège* s.n. (" *C. alceifolius* a" and " b", L), *Pappe* s.n. (BOL, SAM); *Bachmann* 88 (JE), 91 (BOL), *Bolus* 9971 (BOL, PRE), 25038 (BOL), *Barker* 4062 (NBG), *Parker* 4618 (BOL, PRE, NBG), *Letty* 60 (PRE). Tulbagh: *Bolus* 5211 (BOL). Wellington: *Thompson* s.n. (PRE). Ceres: *Guthrie* 3374 (NBG); Paarl: *Pappe* s.n. (BOL), *Esterhuysen* 9053 (BOL). Caledon: *Bolus* 25037 (BOL). Victoria-West: *Thode* A2169 (PRE); without precise locality: Specimen in herb. Burman (G-Del., photo in PRE, type!); specimen in herb. Lamarck (P, photo in PRE, type of *C. alceifolius* Lamk.), *Zeyher* 1231 (BOL, SAM).

Of these, *Pappe* s.n. from Clanwilliam (SAM) and *Thorne* s.n. from Clanwilliam, among other ones, approach the var. *plicatus* and var. *bowieanus*, respectively.

14 b. *C. capensis* var. *plicatus* (*Desr.*) *Baker* in *Dyer*, *Fl. Cap.* 4, 2 (1904), p. 78, as to new combination only, exclus. descr., synonyms and specimens cited. *C. plicatus* *Desr.*; *C. falkia* *Jacq.* non *Thunb.*

Type of variety: A specimen leg. *Sonnerat* in herb. Lamarck (P, photo PRE).

Very similar to *C. capensis* var. *capensis* but differs in the shapes of the leaves which are ovate-cordate, ovate or triangular-cordate, toothed or crenate-serrate, more rarely dissected, usually very acute, 1-4 cm. long and 0.75-2 cm. wide; petioles 0.5-1 cm., in the peduncles which are usually short, under 4 cm. long and in the sepals which are usually narrower, acute or acuminate.

CAPE PROVINCE.—Swellendam: *Pappe* s.n. (SAM, GRA), "*Ecklon*" s.n., but probably leg. *V. Ludwig* (BOL), *Ecklon & Zeyher* 70. 10 (GRA, L), *Zeyher* 3440 (SAM), *Bolus* 25036 (BOL), *Galpin* 4352 (GRA, PRE), *Thode* A 2379 (PRE, BOL); *Wurts* 327 (NBG). Uitenhage: *Ecklon* 9 (SAM); without precise locality: *Sonnerat* s.n. in herb. Lamarck (P, photo PRE), *Pappe* 33 (SAM).

The specimen *Pappe* s.n. from Swellendam is more or less intermediate between this variety and the var. *capensis*.

14c. *C. capensis* var. *bowieanus* (*Rendle*) *A. Meeuse*, stat. nov. *C. filiformis* *Thunb.* (1818), non *Desr.* (1789). *Merremia bowieana* *Rendle* in *Jl. Bot.* 31 (1901), p. 63. *Ipomoea bowieana* (*Rendle*) *Baker*.

Type of variety: *Bowie* s.n. (BM, photo of type specimen in PRE).

Whole plant (except the calyx) usually much more glabrous than in the var. *capensis*. Leaves linear, frequently with small basal auricles or hastate at the base with bifid basal lobes sometimes almost filiform with revolute edges, 2.5 (-7) cm. long, the lowermost often palmately 5-fid and dissected changing upwards into oblong ones with hastate base, petioles generally under 5 mm. long. Peduncles as a rule under 4 cm. long; bracteoles often somewhat broader, linear-oblong or somewhat spatulate, pedicels often densely hairy. Calyx usually densely hairy, rarely nearly or almost completely glabrous, sepals usually broader and rounded or obtuse to emarginate, minutely apiculate. Midpetaline areas densely hairy; otherwise as the var. *capensis*.

CAPE PROVINCE.—Swellendam to George: "On roadsides in the Districts of Swellendam and George", *Bowie* s.n. (BM, type of variety, photo of type in PRE). Bredasdorp: *Esterhuysen* 4449a (BOL). Riversdale: *Schlechter* 1834 (BOL, GRA), *Muir* 2014 (BOL, PRE); George. *Fourcade* 3425 (BOL). Uniondale: *Fourcade* 1720 (GRA), 2105, s.n. (BOL), *Esterhuysen* 6811 (BOL), *Compton* 10535 (NBG). Humansdorp: *Fourcade* 2626, 5916 (BOL), *Esterhuysen* 6672 (BOL). Oudtshoorn: *Compton* 21767, 23155 (NBG). "Uitenhage": *Ecklon & Zeyher* 93.10 (GRA, JE, L). Port Elizabeth *Drège* 7831a (L), *Tyson* 2273 (SAM), *Paterson* 146 (BOL, GRA, KMG), 1065 (GRA), *West* 354 (BOL), *I. L. Drège* 103A (GRA, PRE) = ? 105 (SAM), *Long* 883 (GRA, PRE). "Klipdrift in Great Karroo", *Schlechter* 2276 (GRA, J). Albany: *Britten* 5649, 5816 (GRA). Without precise locality: specimens leg. *Thunberg* in *Thunberg Herb.*, Uppsala (photos in PRE), type material of *C. filiformis* Thunb. non Desr.

The specimens *Muir* 2014, *Esterhuysen* 6811 and some others form a transition to the var. *capensis*.

The var. *plicatus* (Desr.) Baker of Fl. Cap. is *Convolvulus thunbergii* R. et S. (see no. 13). The combination based on *C. plicatus* Desr., made by Baker, applies to the type of the latter, but the synonyms, the description and quoted specimens must be excluded.

C. capensis is geographically separated from *C. thunbergii* (except the var. *bowieanus*) and although *C. thunbergii* was treated as a variety of *C. capensis* in Flora Capensis, I am of the opinion that *C. thunbergii* is a very distinct species, much more close related to *C. natalensis* than to *C. capensis*. *C. capensis* differs from *C. thunbergii* in the usually longer and thicker peduncles, usually larger flowers, the less acute or obtuse sepals (except in the var. *plicatus*), the often palmately nerved to palmatisect leaves (pinnatisect or penninerved in *C. thunbergii*) and especially in the very short stigmas. The very short stigmas account for the redescription of the var. *bowieanus* in the genus *Merremia*. However, the generic features of this plant agree with *Convolvulus* (e.g. often pink flowers; those of *Merremia* are orange or yellow to white, often with a dark centre) and the stigmas are never quite globose, but even in the extreme case of the var. *bowieanus* always flattened on the inner side. For the third variety, the epithet *bowieanus* was taken up, because Thunberg's older name *Convolvulus filiformis* (1818) is invalidated by *C. filiformis* Desr. (1789).

Especially in the var. *capensis*, several types of leaves are often found on one specimen. The variation in leaf-shape is mainly responsible for the various synonyms under which it was redescribed. In the var. *capensis* the first leaves formed are undissected as I could observe on seedlings and young cultivated plants grown in Pretoria. If the plants are depauperated or cannot climb they produce flowers before any dissected leaves are formed. Such specimens are for instance the type of *C. inconspicuus* Hall. f. (leg. *Drège*) and *Esterhuysen* 1370. Later, especially on vigorously growing stems, dissected leaves are formed. Specimens showing only undissected leaves often have short peduncles, whereas specimens which show only palmatifid leaves often have long, not infrequently few-flowered peduncles, so that these extremes look very

different. However, there are many herbarium specimens which show the transition in leaf-shape on a single stem and the observation of plants grown from seed confirms the identity. This tendency to develop dissected leaves towards the tips of the stems is also present, though less pronounced in the var. *plicatus* and in some other South African species of *Convolvulus* (*C. dregeanus*, *C. aschersonii*).

Another tendency is the reduction of the lateral lobes and the predominance of the central lobe of the leaves. This is frequently seen in the var. *capensis* and in some cases the leaves resemble those of the var. *bowieanus* very much. The reduction of the lateral lobes is extreme in some specimens of the var. *bowieanus* in which the reduction can be so complete that the leaves are linear to filiform, such as in the type specimens of *C. filiformis* Thunb. and *Merremia bowieana* Rendle.

The specimens here referred to the var. *bowieanus* are usually densely hairy on the calyx and the stems and peduncles are rather stout, but in some specimens such as the type of *C. filiformis* Thunb. the stems and peduncles are slender and the calyx can be almost completely glabrous as in some specimens from Oudtshoorn (*Compton*, 21767, 23155). These specimens resemble *C. bidentatus* in the glabrous calyx and narrow leaves, but they can be distinguished by the absence of the hastately spreading basal lobes of the leaf as found in *C. bidentatus*, by the usually 1-flowered peduncles (often 2-flowered in *C. bidentatus*) and also by the shape of the sepals which are in addition more herbaceous and not distinctly membranous along the edges as those of *C. bidentatus*.

15. *Convolvulus arvensis* L., Sp. Pl. ed. 1 (1753), p. 153; Choisy in DC., Prodr. 9 (1845), p. 406; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 75; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 97; Phillips, Weeds of S. Africa (1938), p. 44, fig. 84.

Type: Linne's original description was completely or mainly based on pre-Linnaean works, but the species is also represented in the Linnaean herbarium and the preserved specimen can be regarded as the type.

Perennial herb forming several to many annual stems from a long taproot. *Stems* prostrate or twining, 0.75–1.75 m. long, angular, sparsely pubescent to glabrous. *Leaves* often secund, entire, ovate-oblong, oblong or lanceolate with hastate or sagittate base, usually obtuse and mucronate at the apex, 2–5 cm. long, glabrous or thinly hairy; petioles shorter than the blades. *Flowers* axillary, solitary or sometimes in 2–3- (occasionally more) -flowered cymes; peduncles angular, shorter or longer than the leaves; bracteoles linear, about 3 mm. long, pedicels always much longer than the calyx. *Sepals* slightly unequal, 3.5–5 mm. long; the out ones a little shorter, elliptic-oblong, obtuse, often shortly ciliate, glabrous or hairy; inner ones broader, to almost orbicular, obtuse to slightly retuse, more or less distinctly mucronulate, usually glabrous. *Corolla* white or pink, white ones sometimes with pink or red mid-petaline areas, broadly funnel-shaped, glabrous, except at the very tips of the mid-petaline areas, 1.5–2.5 cm. long and 2–3 cm. in diam., the limb shallowly lobed. *Stamens* slightly unequal; filaments with broadened base which is papillose at the margins. *Ovary* glabrous. *Capsule* ovoid-globose, glabrous, 5–8 mm. long. *Seeds* dark brown or black, glabrous, minutely verrucose-rugose.

Originally a native of Europe and parts of Asia, but now a common weed in temperate and subtropical areas throughout the world, rarely in the tropics. As a weed it frequently occurs in grain lands.

In S. Africa it is recorded from all Provinces and very common in several areas, where it is often a serious pest.

DOUBTFUL SPECIES OF CONVULVULUS.

C. burmannii Choisy in DC., Prodr. 9 (1845), p. 405; Baker & Rendle in Dyer, Fl. Cap. 4, 2 (1904), p. 71.

This species was described by Choisy from a specimen in Burman's herbarium (Geneva-Delessert). However, when upon my request Professor Baehni tried to locate the specimen, he could not trace it. He reported that the specimen must already have been lost about 1890 when Hallier revised the Convolvulaceae in the Geneva herbarium, because Hallier did not treat this species in his paper on *Convolvulaceae Africanae* (1893). Hallier evidently only knew Choisy's description, which is very short and incomplete, and he suggested in Engl. Bot. Jb. 18 (1893), p. 147 that it might be referable to "*Ipomoea plantaginea*" (= *I. simplex*).

I cannot recognise Choisy's plant from the description but, if the specimen was indeed collected in S. Africa in Burman's time, there can hardly be any other species but *I. simplex* to which it could be referred. The pubescence of the stems and leaves indicated by Choisy in conjunction with the fruticose stem also suggest *Turbina oenotheroides*, but the sepals are stated to be glabrous.

Even if it is to be regretted that this species remains doubtful, it can hardly be of any importance from a nomenclatural point of view, because practically all other species of *Convolvulus* and *Ipomoea* which occur in the area explored in Burman's time have older names or contemporary names (also given by Choisy in 1845), whereas the species described later (such as *C. galpinii*, *I. pellita*) are altogether different from the description of *C. burmannii*.

TO BE EXCLUDED FROM THE SOUTH AFRICAN FLORA.

C. petraeus Lee ex Choisy in DC., Prodr. 9 (1845), p. 413. This species was entirely overlooked by Hallier in his treatment of the African Convolvulaceae and is not mentioned in the Flora Capensis either.

Professor Baehni kindly sent a photograph of the type specimen preserved in Geneva. He added the information that the specimen had been filed in a wrong place many years ago and Hallier, who studied the Convolvulaceae at Geneva about 1890, did not see the specimen.

The photograph of the type showed that this plant is not identical with any South African plant. Mr. de Winter, who visited the Geneva herbarium in 1953, was able to solve this problem. The type of *C. petraeus* is a specimen of *C. massonii* Dietr. a species occurring in Madeira and Teneriffe. Masson probably sent his plant, or seeds of it, to Lee, who erroneously regarded it as South African and sent it as such to Choisy. Choisy did not recognise the identity because the type or isotype of *C. massonii* (also a Masson specimen!) studied by Choisy is a mature twig, whereas the type of *C. petraeus* is from quite a young plant. Other specimens from Madeira show that the difference in general appearance between the two types is due only to differences in maturity. *C. petraeus* must, therefore, be excluded from the South Africa flora.

The synonymy is as follows: *C. massonii* Dietr., Lex. Nachtr. 2 (1816), p. 377 ("*Massoni*"); Choisy in DC., Prodr. 9 (1845), p. 413; Hall f. in Engl. Bot. Jb. 18 (1893), p. 109. *C. petraeus* Lee ex Choisy, op cit., p. 413.

8. CALYSTEGIA

R. Br., Prodr. Fl. Nov. Holl. ed. 1 (1810), p. 483, nomen gener. conserv.; Choisy in DC., Prodr. 9 (1845), p. 433; Benth. & Hook., Gen. Plant 2 (1876), p. 874; Peter in Engl. u. Prantl., Natürl. Pfl.fam., ed. 1, 4·3a (1891), p. 36; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 580, and 18 (1893), p. 110; Baker & Rendle in Dyer, Fl. Trop. Afr.

4·2 (1905), p. 99; Phillips, Gen. S. Afr. Flow. Pl., Ed. 1 (1926), p. 511; Van Ooststr. in Blumea 3 (1939), p. 284, and in Van Steen., Fl. Males. Ser. 1, 4·4 (1953), p. 437. *Volvulus* Medic., Phil. Bot. 2 (1791), p. 42 and in Staatsw. Vorl. Churf. Phys. Oek. Ges. 1 (1791), p. 202. *Convolvulus* L., Auct. pro. parte; Salter in Adamson & Salter, Fl. Cape Penins. (1950), p. 683.

Type Species: *Calystegia sepium* (L.) R. Br.

Characters generally as in *Convolvulus*, but bracteoles large and clasping the calyx. *Corolla* medium-sized to large, white or pink. *Pollen* globose, smooth. *Ovary* 1-celled or imperfectly 2-celled, 4-ovuled; stigmas 2, oblong or elliptic, flattened. *Seeds* black, smooth or verrucose.

About 25 species in the temperate and tropical regions of both hemispheres. Two species in South Africa:

- Leaves hastate-sagittate, more or less acute; climbing plant with subacute bracts, introduced (Cape Peninsula)..... 1. *C. sepium*.
- Leaves reniform, obtuse; prostrate plant with obtuse bracts, growing on loose calcareous sand near beaches (only records from Riversdale and Knysna)..... 2. *C. soldanella*.

1. *C. sepium* (L.) R.Br., Prodr. Fl. Nov. Holl., ed. 1 (1810), p. 483; Choisy in DC., Prodr. 9 (1845), p. 433. *Convolvulus sepium* L., Sp. Pl., Ed. 1 (1753), p. 153, Salter in Adams. and Salter, Fl. Cape Penins. (1950), p. 685.

Type: The original description was based on Bauh. Pinax 294, but the species is also represented in the Linnean herbarium and the specimen may be taken to represent the lecto-type.

A perennial climbing herb. *Stems* terete, 1–3 m. long. *Leaves* herbaceous, triangular in outline, sagittate or hastate-sagittate, 4–8 (–12) cm. long and 2–5 (–6) cm. wide at the base; apex acute or acuminate; basal lobes slightly divergent, obliquely truncate or acute, often more or less angulate; petioles 1–4 (–5) cm. long. *Peduncles* 1-flowered, longer than the leaves; bracteoles ovate or ovate-cordate, acute or subobtusate, about 18 mm. long, longer than the calyx and more or less concealing it. *Sepals* broadly lanceolate, very pale green, up to 10 mm. long. *Corolla* funnel-shaped, white or pink (with white stripes), 5–5·5 cm. long. *Capsule* subglobose.

A native of Europe and probably also N. America, introduced as a weed elsewhere.

CAPE PROVINCE.—Cape Peninsula, railway side S. of Steenberg Station: Salter 889 (BOL), Muizenberg, Sand Vlei: Moss 7497 (J, BOL).

2. *C. soldanella* (L.) R.Br. ex R. et S., Syst. Veg. 4 (1819), p. 184; Choisy in DC., Prodr. 9 (1845), p. 433; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 111; Muir in Kew Bull. 1934, p. 44–45. *Convolvulus soldanella* L., Sp. Pl. Ed. I (1753), p. 159.

Type: Linnaeus based this species on Bauhin's Pinax, but the species is also represented in the Linnean herbarium and this specimen may be taken to represent the lecto-type.

Straggling perennial herb, growing in calcareous sand near the sea shore. *Rhizome* 10–60 cm. long, producing short upright slender stems. *Leaves* somewhat fleshy, reniform, with deep basal sinus and rounded basal lobes, 1–4 cm. long and about as wide, but usually about 2 cm. diam., obtuse or emarginate, more or less repand; basal lobes rounded, petioles usually longer than the blades. *Peduncles* mostly longer than the leaves, sharply quadrangular; bracteoles broadly oblong, rounded at the apex, slightly shorter than the calyx, 10–15 mm. long. *Corolla* 2·4–4 cm. long, pink, mauve or pale purple. *Capsule* ovoid, acute.

W. Europe to the coast of the North Sea and the Baltic; N. Africa; Asia; N. and S. America; Australia; S. Africa, always in calcareous loose sand near the sea shore, its seeds distributed by sea currents.

This species was recorded by Muir from Riversdale near Morris Point (Muir, l.c.); the only other record is the following:

CAPE PROVINCE.—Buffalo Bay (Knysna): *Keet* 861 (PRE, GRA).

The combination *Calystegia soldanella* is generally attributed to Robert Brown, but Brown only mentioned (in Prodr. Fl. Nov. Holl. (1810), p. 483) that in his opinion *Convolvulus soldanella* L. belongs in *Calystegia* and did not actually make the combination. The first time the combination occurs is in Roemer et Schultes, Syst. Veg. 4 (1819), attributed to Robert Brown, and the correct citation is, therefore, *Calystegia soldanella* (L.) R.Br. ex R. et S.

9. HEWITTIA

Wight et *Arnott* in Madr. Jl. Sci., ser. 1, 5 (1837), p. 22; Benth. et Hook., Gen. Pl. 2 (1876), p. 873; Peter in Engl. u. Prantl, Nat. Pfl. fam., ed. 1, 4:3a (1891), p. 32; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 68; Baker & Rendle in Dyer, Fl. Trop. Afr. 4:2 (1905), p. 100, Phillips, Gen. S. Afr. Flow. Pl. Ed. 2 (1951), p. 623; Ooststr. in Steen., Fl. Males. Ser. I, 4, 4 (1953), p. 438. *Shutereia* Choisy in Mém. Soc. Phys. Genève 6 (1833), p. 485, t. 2, fig. 11, et in DC., Prodr. 9 (1845), p. 435; Van Ooststr. in Blumea 3 (1939), p. 286, non *Shuteriea* Wight et Arnott (1834), q.e. nomen conservandum.

Herbaceous, pubescent, twining or prostrate. *Leaves* entire, angular or lobed, cordate at the base. *Flowers* axillary, solitary or in few-flowered subcapitate cymes; bracteoles oblong or linear-lanceolate, acuminate, at some distance from the calyx. *Sepals* 5, acute, herbaceous. *Corolla* medium-sized, campanulate to funnel-shaped, 5-angled. *Stamens* 5, included; filaments linear with dilated base; pollen smooth. *Disc* annular. *Ovary* hairy, 1-celled or imperfectly 2-celled at the apex, 4-ovuled, style simple, included; stigmas 2, ovate-oblong. *Capsule* 1-celled, 4-valved, 4- or by abortion less-seeded. *Seeds* black, glabrous, opaque.

The only species, *H. sublobata* (Linn. f.) O.Ktze., is found in tropical Africa, southwards to Natal, N. Transvaal and S.W. Africa; also in tropical Asia, Malaysia and Polynesia.

Although *Shutereia* Choisy (1833) need not necessarily be considered to be an orthographical variant of *Shuteriea* W. et A. (1834), it is better to consider it to be illegitimate on account of the nomen conservandum *Shuteriea* W. et A. (Leguminosae). Moreover, *Hewittia* has been used by most authors and is retained here.

H. sublobata (Linn. f.) O.Ktze., Rev. Gen. (1891), p. 441; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 111; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 212; Van Ooststr. in Van Steen., Fl. Males. Ser. 1, 4, 4 (1953), p. 438; Brenan in Mem. New York Bot. Garden 9 (1954), p. 9. *Convolvulus sublobatus* Linn. f., Suppl. (1781), p. 135. *Convolvulus bicolor* Vahl, Symb. 3 (1794), p. 25, non Desr. (1789). *Shutereia bicolor* (Vahl) Choisy, op. cit. (1833), p. 48, t. 2, fig. 11; (1845), p. 435. *Hewittia bicolor* (Vahl) Wight et Arn., op. cit. (1837), p. 22; Baker & Wright, op. cit., p. 68; Baker & Rendle, op. cit., p. 100, nomen illeg. *Shutereia sublobata* (Linn. f.) House in Bull. Torrey Bot. Cl. 33 (1906), p., 318; Van Ooststr. in Blumea 3 (1939), p. 287.

Type: No recognised type specimen could be located.

Stems slender, 1–2 m. long, angular, usually more or less pubescent, occasionally rooting. *Leaves* oblong or ovate to broadly ovate in outline, adpressed-pubescent to nearly glabrous, cordate or sometimes truncate at the base; the auricles entire or angular, occasionally spreading and blade more or less hastate; the apex acuminate to obtuse, mucronulate: the edge entire or grossly dentate; blade 3–12 cm. long and 4–10 cm. wide: petiole pubescent, 1–6 cm. long. *Peduncles* 1–10 cm. long, pubescent, 1-flowered or occasionally bearing 2–3 flowers in a dense head; bracteoles oblong-lanceolate or narrower, much exceeding the very short, up to 3 mm. (in fruit 5 mm.) long pedicels. *Sepals* more or less hairy and ciliate, unequal, outer ones much larger, more or less ovate, 9–15 mm. long, the third more or less oblique, inner two smaller, ovate with broadened and scariously margined base, 7–7.5 mm. long. *Corolla* 2–2.5 cm. long, cream or yellow, usually with a maroon or purple “eye”, the limb with, 5 very short, rounded, emarginate, mucronulate lobes; midpetaline areas pilose outside. *Ovary* densely hairy with long white hairs, also a few long hairs on the basal part of the style. *Capsule* depressed-globose to more or less quadrangular, crowned by the persistent style, pilose, about 8 mm. long and 10 mm. in diam. *Seeds* 4–2, black, opaque, glabrous except the pubescent hilum, 5–6 mm. long.

This well-known species was recorded from the following districts:

S.W. AFRICA.—The northernmost part near the Cunene River (Ovamboland) and near the Okavango.

TRANSVAAL.—Barberton, Nelspruit, Letaba, Zoutpansberg.

NATAL.—From Zululand to Durban and along the coast southwards, extending into the E. Cape (Port St. Johns). Also rather frequent in Angola and Portuguese East Africa, but the only Rhodesian specimens I have seen came from the eastern border near Melsetter.

10. JACQUEMONTIA

Choisy in Mém. Soc. Phys. Genève 6 (1833), p. 476 and in DC., Prodr. 9 (1845), p. 396; Benth & Hook., Gen. Pl., 2 (1876), p. 874; Peter in Engl. u. Prantl, Natürl. Pfl. fam., Ed. 1, 4·3a (1891), p. 33; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 578; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 69; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 85; Phillips, Gen. S. Afr. Flow. Pl., Ed. 2 (1951), p. 622; Van Ooststr. in Van Steen., Fl. Males. Ser. 1, 4·4 (1953), p. 431.

Type species: Probably *J. ferruginea* (Steud.) Choisy (Brazil).

Herbaceous to woody, twining or prostrate, usually hairy, with stellate hairs. *Leaves* variable, often cordate at the base, entire, rarely lobed. *Flowers* in axillary, pedunculate, umbellate or capitate cymes, with or without an involucre; *bracteoles* small, linear to lanceolate or the outer ones larger, foliaceous; pedicels very short or 0. *Sepals* 5, often unequal. *Corolla* small to medium-sized, funnel-shaped or campanulate, blue, mauve or pink, rarely white: the limb 5-toothed or nearly entire, rarely lobed; midpetaline areas distinct. *Stamens* included, filaments linear, anthers oblong; pollen smooth. *Disc* small or none. *Ovary* 2-celled, 4-ovuled; style simple, included; stigmas 2, ovate or oblong, more or less flattened. *Capsule* globose, 2-celled, 4- or 8-valved, 4- or by abortion less-seeded. *Seeds* usually glabrous.

Species about 120, mainly American, a few in tropical Africa, Asia and Australia; one species in South Africa.

J. tamnifolia (L.) Griseb., Fl. Br. W. Ind. (1861), p. 474; E. A. Bruce in Kew Bull. 1940, p. 63. *J. capitata* (Desr.) G. Don, Gen. Syst. 4 (1837), p. 283; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 95, Wood & Evans, Natal Pl. 1 (1899), t. 13; Baker & Wright, op. cit., p. 69; Baker & Rendle, op. cit., p. 85; Hutch & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 211.

Type: Linnaeus based this species on the figure in Dill. Hort. Elth. p. 428, t. 318, f. 410 (1732).

Annual. Stems several from the base, twining or trailing, occasionally suberect, up to about 75 cm. long, finely pilose with usually brownish, rarely whitish pubescence. *Leaves* ovate, oblong to broadly cordate, 4–9 cm. long, 2–8 cm. wide, entire: the base shallowly cordate to truncate or occasionally abruptly cuneate; the apex acuminate or acute, the blade glabrescent or more or less pilose with brownish or white hairs, ciliate; petioles slender, shorter than the corresponding blades, usually much more densely pilose than the blade or stem. *Peduncles* usually longer than the leaves, terete, often pilose, bearing at the apex a dichotomously forked condensed cyme which forms a dense globose head up to 3 cm. in diam., bracteate by reduced leaves with narrowing base, the inner ones becoming smaller and more hairy ultimately resembling the sepals. *Sepals* about 5 mm. long, subequal, lanceolate, acute, shaggy with soft ferruginous or rarely white hairs. *Corolla* blue, very rarely mauve to white, fugacious, funnel-shaped, 5-angled, obscurely 5-lobed, about 10 mm. long, glabrous; midpetaline areas conspicuous. *Capsule* globose, 4–5 mm. in diam., glabrous. *Seeds* usually 4, bright brown, 2–2.5 mm. long, glabrous, finely scabrid-rugose.

Its known distribution is America (Southern United States, Central America, West-Indies, Guyana, etc.), tropical and South Africa, Mascarenes. In South Africa recorded from: SOUTH WEST AFRICA (Northernmost part); BECHUANALAND (Caprivistrip and Ngamiland); TRANSVAAL (Zoutpansberg, Letaba, Nelspruit, Barberton); NATAL and ZULULAND, along the coast South to the Umlaas River.

The African specimens had always been referred to as *J. capitata*, but Hallier in Med. Rijksherbarium Leiden 35 (1918), p. 15, already reduced *J. tamnifolia* to *J. capitata* (he maintained the name *J. capitata*, probably on account of the "Kew-Rule"). Miss E. A. Bruce independently came to the conclusion that they are identical (cf. Kew Bull. 1940, p. 63, for additional details and full synonymy).

11. MERREMIA

Dennst., Schlüss. Hort. Malab. (1818), p. 12, 23 nomen nudum; ex *Hall. f.* in Engl. Bot. Jb. 16 (1893), p. 581, descr.; Peter in Engl. u. Prantl, Nat. Pfl. fam. 4:3a, Nachträge (1895), p. 377; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 101; Ooststr. in Blumea 3 (1939), p. 292, and in Steen., Fl. Males. Ser. I, 4:4 (1953), p. 439; Phillips, Gen. S. Afr. Flow. Pl., Ed. 2 (1951), p. 623. *Ipomoea*, pro parte, Auct.; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 46, exclus. type.

Type species: *Merremia convolvulacea* Dennst., l.c. = *M. hederacea* (Burm. f.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 118 = *Evolvulus hederaceus* Burm. f., Fl. Ind. (1768), p. 77, t. 30, f. 2.

Herbaceous or woody twiners, or prostrate, rarely suberect. *Stems* terete, more rarely winged. *Leaves* entire, dentate, auricled, lobed or palmately or pedately partite to compound. *Flowers* axillary, solitary or in few- to many-flowered variously ramified inflorescences, but usually cymose, bracteoles usually small. *Sepals* 5, usually subequal, acute to rounded, narrow to orbicular, herbaceous to coriaceous, in several species accrescent in fruit. *Corolla* funnel-shaped or campanulate, white or yellow to orange, often with darker brownish or purplish centre, usually with distinct midpetaline areas,

the limb faintly 5-lobed, occasionally distinctly so. *Stamens* included; filaments filiform, often unequal; anthers often spirally contorted, pollen espinose, ellipsoid. *Disc* saucer-shaped. *Ovary* 2-celled or 4-celled, 4-ovuled; style filiform; stigma biglobose, *Capsule* usually dehiscent by 4 valves, sometimes also circumscissile at the base, or irregularly dehiscent, 4- to 1-celled. *Seeds* 4, or less by abortion, glabrous or pubescent, especially on the angles.

Species about 80, widely spread in the tropics of both hemispheres.

Van Ooststroom (1939), p. 293, has pointed out that *Merremia* Dennst. ex Hall. f. can be maintained, because the older synonyms *Skinneria* Choisy (1833) and *Spiranthera* Boj. (1837) are illegitimate, being later generic homonyms of *Skinneria* Forsk. (1776) and *Spiranthera* St. Hil. (1823), respectively, so that *Merremia* stands.

Generally speaking, the species of *Merremia* have white, cream or yellow flowers, often with a dark (reddish, purplish or brownish) centre. This is in striking contrast to the genus *Ipomoea*, which often has pink, mauve to purple or magenta flowers and in which yellow flowers are of rare occurrence.

The South African species belong to the sections *Xanthips* (Griseb.) Hall. f. (species 1-3) and *Streptandra* Hall. f. (species 4-9).*

- Leaves pinnatisect, usually with patent hairs; flowers small: calyx 6-8 mm. long, corolla 7-8 mm. long..... 8 *M. pinnata*.
- Leaves palmately compound, entire, auricled at the base or, if pinnatisect, leaves glabrous and flowers much larger:
- Main stems distinctly winged; ultimate branches 4-ribbed-4-angled; calyx glabrous, coriaceous, concolorous:
- Leaves palmately 3-5 (-9)-lobed, perennial woody climber..... 1. *M. pterygocaulos*.
- Leaves cordate-orbicular to cordate-lanceolate, entire..... see *Operculina turpethum*.
- Main stems not distinctly winged, or, if more or less angular, calyx inflated, plicate-ribbed, with purple longitudinal stripes and purple dots:
- Calyx inflated, plicate-ribbed, the ribs purplish, sepals herbaceous, pubescent, unequal; annual..... 2. *M. verecunda*.
- Calyx not plicate-ribbed, concolorous; sepals smooth, glabrous or sometimes pubescent, often coriaceous:
- Leaves deeply palmatisect or pinnatisect to bipinnatisect, or lobes of palmate leaf more or less dissected:
- Calyx 7-10 mm. long; sepals elliptic, rounded at the apex, pale green with membranous edges; corolla 2-2.5 cm. long, 3-4 cm. in diam..... 3. *M. palmata*.
- Calyx 14-20 mm. long, sepals obtuse or acute but not rounded at the apex, drying brownish; corolla 4-6 cm. long the limb 5-7 cm. in diam.:
- Leaves herbaceous, palmately 5-7 lobed, 6-15 cm. in diam., the lobes entire to pinnatisect; tall woody climber..... 4. *M. kentrocaulos*.
- Leaves somewhat fleshy, irregularly palmately-pinnately dissected to bipinnatisect, 3-7 cm. in diam.; stems herbaceous, annual from perennial root-stock (S.W. Africa)..... 5. *M. bipinnipartita*.

* When the manuscript was ready for the press, Dr. R. Story collected another species in the Kaokoveld, South West Africa. The material was in a very poor condition when collected and it could not be named with absolute certainty. It is most probably *M. quercifolia* Hall. f., thus far only known from Angola.

Leaves not deeply dissected (sometimes palmately lobed), often auricled at the base:

Leaves deltoid-ovate to subreniform, more or less lobed or crenate with more or less cordate base, hairy below (only recorded from Eastern Cape).....

6. *M. malvaefolia*.

Leaves linear or lanceolate to oblong, usually hastate or auricled at the base:

Flowers up to about 16 mm. long; calyx glabrous; basal auricles of leaves usually with several acute teeth.....

7. *M. tridentata* ssp. *angustifolia*.

Flowers 20–35 mm. long; calyx usually densely hairy outside; basal auricles of leaves entire or bifid

See *Convolvulus capensis* var. *bowieanus*.

1. *M. pterygocaulos* (Choisy) Hall. f. in Engl. Bot. Jb. 16 (1893), p. 552 and 18 (1893), p. 113; Baker and Wright in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 105; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 212. *Convolvulus pterygocaulos* Steud., cheironym (Schimper, Pl. Abyss., 2, No. 630, printed herbarium label). *Ipomoea pterygocaulos* (Steud. ex) Choisy in DC., Prodr. 9 (1845), p. 381. *Ipomoea tetraptera* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 65. *Merremia tetraptera* (Baker) Hall. f. in Meded. 's Rijksherb. Leiden 1 (1910), p. 21.

Type: *Schimper* 630 from Abyssinia in herb. Geneva; isotypes at K and probably elsewhere.

Perennial, more or less shrubby climber, glabrous in all its parts except the corolla. *Main stems* with 4 membranous wings, ultimate branches slender, 4-angled. *Leaves* cordate-ovate to suborbicular in outline, 3–15 cm. long and wide, palmately 3–7 (–9)-lobed to about the middle, the lobes usually ovate, acute or cuspidate and mucronate, entire or subrepand; petioles more or less 4-angled, shorter than the blade. *Peduncles* up to 15 cm. long, but often much shorter; more or less 4-angled, cymosely few-flowered or (by reduction) rarely 1-flowered; bracteoles minute, linear; pedicels up to about 2 cm. long, ultimately distinctly angled, thickened, subclavate and remaining erect in fruit. *Calyx* 9–11 mm. long; sepals obovate-oblong or oblong, obtuse, much imbricate, chartaceous, pale yellowish green, accrescent and becoming broadly ovate to orbicular and ultimately spreading in fruit. *Corolla* broadly funnel-shaped, pale yellow, cream or white, densely long-silky with glistening silvery hairs on the mid-petaline areas outside, 2·5–3 cm. long and 3·5–4·5 cm. in diam. *Capsule* ovoid-conical, more or less truncate or flattened-depressed at the apex and crowned with the persistent style-base, 12–15 mm. long and about as wide at the base, glabrous. *Seeds* black, smooth, glabrous, about 7 mm. long when quite ripe.

Distribution.—Practically the whole of Africa south of the Sahara, as far north as Abyssinia, as far south as Angola and Southern Rhodesia, extends into the Eastern Cape Province.

CAPE PROVINCE.—Kentani, Quora Bridge: Acocks 12295 (PRE).

NATAL.—Palmiet nr. Durban: Wood 7542 (NH, one of the original numbers cited by Baker under *I. tetraptera*)—Camperdown: Franks in Herb. Wood no. 11077, (BOL, PRE, SAM)—Kranskop: McKen 1 (NH, also cited by Baker)—“Bank of Little Tugela”; Wood 3500 (NH, also cited by Baker).

Upon examination of original specimens of *Ipomoea tetraptera* Baker and a considerable number of specimens referred to *M. pterygocaulos* (among them several authenticated or frequently cited ones), I came to the conclusion that *I. tetraptera* is identical with the wide-spread African species.

M. pterygocaulos seems to be rare in Southern Africa and has been recorded only a few times.

2. *M. verecunda* Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 110; Pilger in Engl. Bot. Jb. 48 (1912), p. 349; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 30 (1955), pl. 1193. *Ipomoea quinquefolia* Hochst. ex Hall. f. var. *pubescens* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 66. *Ipomoea verecunda* (Rendle) N.E.Br. in Kew Bull. 1909, p. 123.

Type: Not designated. Baker (in Fl. Cap.) quoted several specimens under *Ipomoea quinquefolia* var. *pubescens* (such as *Burke* 413 and *Muskett* in Herb. Bolus 9285). Rendle (l.c.) mentioned only two specimens (*Mrs. Lugard* 134 and *Lugard* 227) from Bechuanaland. Considering that Rendle did not mention a single specimen from S. Africa and that the description of *I. quinquefolia* var. *pubescens* is very vague, he described a new species altogether and the original specimens, therefore, are the two gatherings from Bechuanaland. I have seen a sheet of *Lugard* 134 and consider this number to be the lecto-type (BM, photograph in PRE, isotype in GRA).

Annual. Stems usually several from the base, herbaceous, green, prostrate or twining, more or less angular, sulcate or minutely winged, glabrous or thinly hairy. Leaves deeply palmately to pedately 7-9 (-11)-sect, 2-8 (-10) cm. in diam, glabrescent; the lobes linear-oblong-oblancheolate or in the lowermost leaves broader, more or less apiculate or mucronate, contracted at the base, the lateral ones gradually smaller; petioles 2-6 cm. long. Peduncles 1-flowered or occasionally cymosely 2-3-flowered, 0-5 cm. long; bracteoles 2 at the base of each pedicel, linear or linear-lanceolate, 5-8 mm. long; pedicels varying in length from about 0.5 cm. (if peduncles long) to about 3 cm. (if peduncles short), at first erect or patent, ultimately reflexed. Calyx turbinate, in flower 10-15 mm. long; sepals unequal, herbaceous, subobtuse to acuminate; outer three very concave, pale green with 6-7 well marked longitudinal purplish red veins, between the veins deeply sulcate-plicate and with small purplish spots, hairy on the nerves, 5-7 mm. wide; inner ones shorter and narrower, 2-4 mm. wide, less concave, without or with only a few purplish stripes, not sulcate or plicate, acute or acuminate even if the outer ones are obtuse, in fruit hardly accrescent in contradistinction to the much accrescent (up to 22 mm. by 14 mm.) outer sepals. Corolla widely funnel-shaped, 15-20 mm. long and 20-30 mm. in diam., light yellow with a purplish-red "eye"; the limb shallowly 5-lobed-5-angled; midpetaline areas not distinct, glabrous or thinly pubescent towards the base. Capsule completely enclosed by the inflated turbinate calyx, 4-lobed and somewhat depressed if 4-seeded (3-lobed, 2-lobed or ovoid with only 3, 2 or 1 seed, respectively), 8-12 mm. in diam. when 4-seeded; pericarp very thin, membranous, scarious white, subhyaline, irregularly dehiscent to 4-valved. Seeds black, shining through the thin pericarp, 5-6 mm. long, long, 4-5 mm. broad, glabrous except for lines of very short velvety pubescence on the angles and the shortly pubescent hilum; the areas between the lines of hairs microscopically pitted.

Endemic but may extend into southern Angola and western Southern Rhodesia.

Recorded from: S.W. Africa, S. to Gibeon, N. at least to Namutoni; Griqualand-W.: Hay, Barkly-W., Kimberley, Vryburg, Hopetown; Orange Free State: Winburg, Bloemfontein, Fauresmith; Transvaal: Christiana, Bloemhof, Wolmaransstad, Rustenburg, Ventersdorp, Potchefstroom, Johannesburg, Vereeniging, Brits, Pretoria, Bronkhorstspuit, Groblersdal, Witbank, Lydenburg, Pietersburg; Bechuanaland: Mochudi and Ngamiland; Basutoland: Leribe.

The calyx is very characteristic with its purplish raised nerves (it resembles that of *Hibiscus trionum*). The seeds become very rugose-papillose after boiling because the outermost layer of the testa swells to form yellowish-grey, sinuous folds, which persist after drying and can then easily be rubbed off.

This species is fairly wide-spread, but not very frequent or perhaps often overlooked. Only about 60 specimens were found in all the S. African herbaria.

3. *M. palmata* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 112; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 108.

Type: Not designated. Hallier quoted *Belck* 52 and *Lüderitz* 175, both from S. W. Africa. As the original Lüderitz specimen was probably destroyed I designate *Belck* 52 in the Haussknecht herbarium, Jena, as the lecto-type.

Glabrous, prostrate or occasionally twining *perennial herb*. *Stems* herbaceous, up to 2 m. long or even longer, sulcate and/or ribbed to almost winged (at least in dried specimens). *Leaves* deeply palmately 5-7 (-9)-lobed (lowest lobes not infrequently unequally forked); lobes narrowly linear to oblanceolate, acute or obtuse, mucronate, 3-6 cm. long and 0.5-8 mm. wide, of lowermost leaves often broader; petiole 2-25 mm. long. *Peduncles* 1-6 cm. long, 1-flowered or occasionally cymosely 2-3-flowered; bracteoles small, linear; pedicels 0.5-3 cm. long, somewhat thicker upwards. *Sepals* pale yellowish green, subequal, elliptic with rounded apex, glabrous, coriaceous with a membranous edge, 7-10 mm. long, 2.5-5.5 mm. wide. *Corolla* pale yellow or sulphur-yellow with a deep-red, maroon or deep magenta "eye", 2-3 cm. long, broadly funnel-shaped with spreading, 3-4 cm. wide, faintly lobed limb; midpetaline areas not distinct, sparsely pubescent towards the apex. *Style* linear with membranous "winged" edges. *Capsule* usually distinctly exserted from the calyx, globose- or ovoid-conical, 8-12 mm. long and 8-10 mm. in diam., glabrous, pale yellowish green turning straw-colour, valves papyraceous. *Seeds* dark greyish brown to black, rather dull, glabrous, 6-7 mm. long, about 5 mm. wide and about 3 mm. thick; testa nearly smooth to distinctly rugose.

S. W. Africa, Bechuanaland, Transvaal, S. Rhodesia, Angola, possibly extending into Trop. E. Africa.

Recorded from: S.W. AFRICA as far S. as Windhoek; Mafeking in the CAPE PROVINCE; BECHUANALAND; TRANSVAAL: Marico, Rustenburg, Brits, Pretoria, Bronkhorstspuit, Waterberg, Pietersburg, Zoutpansberg, Sibasa and the eastern districts South to Barberton.

4. *M. kentrocaulos* (C. B. Clarke) Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 103; Hall. f. in Meded. Rijksherb. Leiden I (1910), p. 21; Hutch. et Dalz., Fl. W. Trop. Afr. 2 (1931), p. 212; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 30 (1955) pl. 1194. *Convolvulus kentrocaulos* Steud., cheironym (Pl. Schimp. It. Abyss. II, no. 800, printed label). *Ipomoea kentrocaulos* (Steud. ex) C. B. Clarke in Hook. f., Fl. Br. Ind. 4 (1883), p. 213; N. E. Br. in Kew Bull. 1909, p. 124, incl. var. *pinnatifida* N. E. Br. *Operculina kentrocaulos* (Steud. ex) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 119.

Type: Not designated by Hall. f., but Steudel's name, taken up by C. B. Clarke and by Hallier, designates *Schimper* 800 from Abyssinia as the type gathering (K, type).

Large, glabrous *perennial twiner*. *Stems* becoming woody and up to at least 15 m. long, the younger ones slender, herbaceous but firm, terete, usually distinctly muriculate with reddish papillae (as are petioles, peduncles and pedicels). *Leaves* pentagonal in outline, 6-15 cm. long and as wide, palmately dissected nearly to the base; base cordate with a narrow sinus; the lobes 5, oblong to lanceolate in outline, obtuse to subacute, entire to irregularly and jaggedly pinnatilobed or pinnatifid; petioles 2-6 cm. long. *Inflorescences* cymose, few-flowered or reduced to a single flower. *Peduncles* patent to suberect, 3-9 cm. long; bracteoles ovate, acute, concave, 3-5 mm. long, early deciduous, occasionally larger and dissected like the leaves; pedicels up to 3 cm. long, at first deflexed, patent to suberect when the flowers open and ultimately cernuous in fruit. *Sepals* ovate-oblong or elliptic, coriaceous with thinner submembranous edges, glabrous, concave, somewhat unequal, obtuse or rounded and minutely

mucronate, 23–26 mm. long (inner ones longer than the outer ones) and about 12 mm., wide. *Corolla* funnelshaped, dull pale-yellow to pale buff with dark purple “eye” glabrous, 4–6 cm. long and 6–8 cm. in diam., the limb faintly 5-angled, finely and faintly plicate, midpetaline areas not sharply defined but smoother than the remainder of the corolla. *Capsule* at first enclosed in the accrescent, brown and coriaceous calyx but ultimately exposed just before dehiscence when sepals spread out, 12–15 mm. in diam., pale brown, dehiscing by 4 valves and circumscissile at the base. *Seeds* brown, minutely hairy and often with a few irregularly distributed white scales (insect-eggs?), 8–9 mm. long and about 6 mm. broad.

Africa south of the Sahara to Angola, Bechuanaland, the Northern Transvaal and Portuguese East Africa; also in India.

TRANSVAAL.—Lydenburg, Steelpoort: *Story* 4063 (PRE); *v.d. Merwe* 2356 (PRE); Waterval River Valley: *Galpin* 12256 (PRE). Letaba, Kruger National Park, nr. Gorge: *v.d. Schijff* 2281, 2324A (PRE); Shingwedzi: *v.d. Schijff* 2985 (PRE). Zoutpansberg, Messina: *Rogers* 20846, 22554 (PRE); Mastrangani: *Breyer* s.n. (PRE, h. no. 16036). Sibasa, Kruger National Park, near Punda Maria: *Obermeyer* 684 (PRE); *Codd* 5342 (PRE); Kloppefontein: *v.d. Schijff* 3324 (PRE).

The seeds I have seen are not glabrous as stated by Rendle (l.c.).

Hallier referred this plant to *Operculina*, but the capsule, although dehiscent at the base, is also 4-valved and its wall is thin, papery, not consisting of two layers as in *Operculina* (see the remarks by Van Ooststroom in *Blumea* 3 (1939), p. 326 regarding, *Merremia tuberosa* (L.) Rendle, which has exactly the same type of capsule as *M. kentrocaulos*). Hallier later (1910) agreed that his *Operculina kentrocaulos* had to be referred to *Merremia*.

There is a considerable degree of variation in the dissection of the lobes of the leaves: They vary from entire to pinnatifid or almost pinnatifid, so that there is no reason to maintain the var. *pinnatifida*.

Although I have not seen the type, I was able to study several specimens (e.g., *Codd* 5342) that had been compared with authentic material.

As regards the correct citation of the authors, Hallier (1893), p. 119 cited *Ipomoea kentrocaulos* C. B. Clarke under *Operculina tuberosa* and used the name “*Operculina, kentrocaulos* (Steud.) Hall. f.” for the species under discussion. I cannot see why *Ipomoea kentrocaulos* C. B. Clarke is not the first legitimate and correctly applied name, because Clarke cites: “*Ipomoea tuberosa* A. Rich. the old-world plant, not of Linn.,” and “*Convolvulus kentrocaulos* Steud. in Pl. Schimp. n. 800”, so that he expressly indicated that this species is distinct from *Ipomoea tuberosa* L. and took up Steudel’s manuscript name. In addition, Clarke’s description applies to the species with the muriculate stems and the adopted specific epithet implies the same. He also defined *Schimper* 800 as the type according to the present rules of nomenclature.

The correct citation, therefore, is *Merremia kentrocaulos* [(Steud. ex) C. B. Clarke] Rendle.

5. *M. bipinnipartita* (Engl.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 115; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 104. *Ipomoea bipinnipartita* Engl. in Engl. Bot. Jb. 10 (1888), p. 246.

Type: *Marloth* 1289 from Usakos, S.W.A. As the original type specimen in the herbarium Berlin–Dahlem was destroyed, I consider the specimen in PRE to be the neo-type (isotype in SAM).

Perennial, glabrous. *Rootstock* tuberous. *Stems* procumbent, with rather long internodes, sparsely and minutely tuberculate as are the petioles and the rachis of the leaves. *Leaves* somewhat fleshy, orbicular to broadly ovate in outline, 3–7 cm. long and wide, bipinnatisect with 2 pairs of lateral leaflets and a terminal one; secondary lobes oblong or linear, usually obtuse but the terminal one very acute, almost entire or with a few distant teeth to nearly pinnatisect; petioles up to 1 cm. long. *Peduncles* short, about as long as the petioles, bearing slightly above the middle the small, ovate, 3–4 mm. long bracteoles. *Sepals* obovate, subpuberulous, about 16 mm. long and about 12 mm. wide, subcoriaceous. *Corolla* funnel-shaped with obtuse shallow lobes, described as white with a black centre by Marloth, but by other collectors as “cream with deep red eye” or “white with purple eye”, about 5 cm. long and 6–7 cm. in diam., glabrous; midpetaline zones with thicker nerves but not well defined. *Capsule* (only one seen) ellipsoid or obovoid, completely enclosed by the calyx (may become ultimately exposed just before dehiscence as in *M. kentrocaulos*), about 9 mm. long and 6 mm. in diam., glabrous, 1-seeded (if 2–4-seeded capsules are formed, they may be considerably larger and of a different shape). *Seed* ellipsoid, truncate at one end, 7 mm. long and about 5 mm. in diam., glabrous (if more seeds develop, the shape and size may be somewhat different).

S. W. AFRICA.—Brandberg (W. of Omaruru): *Liebenberg* 4982 (PRE). Usakos: *Marloth* 1289 (PRE, type, SAM, isotype); *Bradfield* 662 (PRE). nr. Karibib: *Kinges* 3168, 3322; *de Winter* 2691, 3220 (PRE). Rehoboth, Buellspport: *Strey* 2089 (PRE). Gibeon, Orab: *Dinter* 2009 (PRE, SAM). Nuis: *Range* 1344 (BOL, SAM).

Although this plant has apparently a very limited distribution, some of the labels mention: “locally abundant”.

6. *M. malvaefolia* Rendle in Jl. Bot. 39 (1901), p. 63. *Ipomoea malvaefolia* (Rendle) Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 65.

Type: McOwan 403 (K) from Kowie (Bathurst).

Annual? *Stems* very slender, trailing, shortly hairy. *Leaves* more or less triangular in outline, up to 3 cm. wide, palmately 5-lobed beyond the middle, brownish tomentose beneath; lobes more or less obovate, contiguous, obtuse, apiculate; petiole much shorter than the blade. *Peduncles* slender, ascending, 1-flowered, 4–10 cm. long; bracteoles small, remote from the calyx. *Calyx* 8–13 mm. long, shortly pubescent; sepals chartaceous, oblong, obtuse, much imbricate, the outer hispid. *Corolla* widely funnel-shaped, probably pale yellow, 3–5 cm. long, silky on the midpetaline areas. *Capsule* unknown.

Apparently a very rare species, recorded only from Bathurst, Albany and Somerset East and as far as I can ascertain, not collected in the last 60 or 70 years.

I know this species only from the isotypes (McOwan 403 in GRA, BOL), but in Fl. Cap. specimens from Albany (leg. Bowker) and Somerset (leg. Bowker), are quoted.

7. *M. tridentata* (L.) Hall. f. ssp. *angustifolia* (Jacq.) Ooststr. in Blumea 3 (1939), p. 323, and in Steen., Fl. Males. Ser. I, 4-4 (1953), p. 446; Brenan in Mem. New York Bot. Garden 9 (1954), p. 8. *Ipomoea angustifolia* Jacq., Collect. 2 (1788), p. 367, and Icon. Rar. 2 (1786–1793), p. 10, t. 317; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 55; N. E. Br. in Kew Bull. 1909, p. 122. *Ipomoea convolvuloides* Schinz in Verhandl. bot. Ver. Brandenb. 30 (1888), p. 273; Dinter in Fedde Repert. 18 (1922), p. 430. *Merremia angustifolia* (Jacq.) Hall. f. in Engl. Bot. Jb. 16 (1893), p. 552 and 18 (1893), p. 117; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 111; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 211. *Convolvulus longipedunculatus* Dinter ms. on *Dinter* 7538.

Type of the subspecies: Jacquin's plate was taken to be representative.

Annual, glabrous or rarely pubescent, prostrate and sometimes also twining *herb*. *Stems* slender, subterete to angular, striate-ribbed, up to at least 1 m. long. *Leaves* linear to narrowly oblong, more or less obtuse, mucronate, 2–8 cm. long, usually 2–6 mm. wide, with small toothed hastate basal auricles; petiole 0.5–3 (–5) mm. long or leaves almost completely sessile. *Peduncles* very slender, 1–6 cm. long, 1-, more rarely 2- or 3-flowered; bracteoles minute, lanceolate or cuspidate, persistent; pedicels thickened upwards, 0.5–2 cm. long. *Sepals* oblong to ovate-oblong or elliptic, obtuse to subacute, cuspidate or mucronate, glabrous, often brownish at least when dried, 5–10 mm. (usually 6–7 mm.) long; two outer ones slightly shorter than the inner ones. *Corolla* pale yellow or occasionally darker yellow or bright lemon-yellow, with or without a darker, reddish or brownish "eye", funnel-shaped, 12–20 mm. long; the limb shallowly 5-lobed with 5 more or less broadly triangular, acute lobes; midpetaline areas well defined, glabrous. *Capsule* globose to ovoid, about 6 mm. in diam.; the valves papery, straw-coloured. *Seeds* 4 or less, yellowish brown to dark greyish brown, 3–4 mm. long, glabrous.

Africa south of the Sahara.

Recorded from: S.W. Africa (south to Okahandja); Griqualand-W. (Kuruman, Vryburg, Mafeking, Hay, Kimberley); Orange Free State (Hoopstad, Kroonstad); Transvaal (practically all districts); Swaziland; Zululand and Natal as far south as Pt. Edward.

This species is very common in many of the regions indicated and represented in South African Herbaria by hundreds of specimens.

8. *M. pinnata* (Hochst. ex Choisy) Hall. f. in Engl. Bot. Jb. 16 (1893), p. 552 and 18 (1893), p. 116; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 113; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 211. *Ipomoea pinnata* Hochst., cheironym (Kotschy, herb. it. nub. no. 262, printed herbarium label); ex Choisy in DC., Prodr. 9 (1845), p. 353; N.E.Br. in Kew Bull. 1909, p. 124.

Type: Kotschy 262 from Kordofan (the only specimen cited by Choisy), location of holotype specimen probably Geneva.

Annual. *Stems* herbaceous, slender, trailing or twining, up to about 75 cm. long, pubescent with soft, more or less distinctly bulbous-based spreading hairs (at least when young), as are the leaves, peduncles, bracts, calyces and capsules. *Leaves* sessile, pinnate, 1–4 cm. long and 0.5–1.5 cm. wide, with 8–10 pairs of entire, linear segments. *Peduncles* about as long as, or longer than the leaf, 1–3-flowered; bracteoles subulate or linear-subulate, 2–8 mm. long; pedicels usually under 6 mm. long (and few-flowered inflorescences appearing subcapitellate) or occasionally up to 15 mm. long. *Sepals* 6–8 mm. long including the about 3 mm. long, aristate apex, 1.5–2 mm. wide, herbaceous; the inner ones slightly narrower and less hairy on the wider basal portion. *Corolla* glabrous, yellow, narrowly funnel-shaped, 7–8 mm. long; its limb distinctly 5-lobed, lobes broadly ovate, obtuse, midpetaline areas not differentiated. *Ovary* with long stiff hairs longer than the ovary. *Capsule* globose or ovoid, straw-coloured, about 6 mm. long and 5–6 mm. in diam. *Seeds* dark brown to black, glabrous, with grey, minutely raised markings, about 2 mm. long, 1–1.5 mm. wide.

From Senegal to the Sudan and southwards to South West Africa, Bechuanaland, Northern Transvaal and Portuguese East Africa.

S.W. AFRICA.—Tsumeb: *Dinter* 7572 (PRE, BOL), 7572a (PRE). Gaub (Grootfontein): *Dinter* 2431 (PRE, SAM).

TRANSVAAL.—Rustenburg: *Codd* 3749 (PRF). Zoutpansberg, Messina: *Rogers* 19482 (BOL, J); Dongola: *Bruce* 51 (PRE); *Codd* 4120 (PRE), nr. Salt Pan; *Schweikerdt and Verdoorn* 568 (PRE). Sebasa, Kruger National Park nr. Punda Maria: *Codd* 5322 (PRE). Nelspruit: *Breyer* h. no. TRV 17704 (PRE).

BECHUANALAND.—N'gamiland, Kwebe Hills: *Lugard* 176 (GRA).

12. OPERCULINA

S. Manso, Subst. Bras. (1836), p. 16; Peter in Engl. u. Prantl, Nat. Pfl. fam., Ed. 1, 4:3a (1891), p. 32; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 582; Ooststr. in Blumea 3 (1939), p. 361, and in Steen., Fl. Males, Ser. I, 4:4 (1953), p. 454. *Ipomoea*, p.p. and *Merremia*, p.p. Auct. plur.

Type species: *Operculina turpethum* (L.) S. Manso.

Characters generally as in *Merremia*, but fruit different. Large herbaceous twiners; stems, peduncles and petioles often winged. *Leaves* entire, angular or digitate, often cordate at the base. *Corolla* large, white or yellow. *Pollen* ellipsoid, spinose. *Ovary* 2-celled, 4-ovuled. *Capsule* large, with circumscissile epicarp, the upper part (which comes off as an operculum or "lid") more or less fleshy; the endocarp scarious, at first entire, ultimately irregularly splitting. *Seeds* 1 or more, large, trigonous or globose, black, glabrous.

Tropics generally (about 15 species).

Rendle in Fl. Trop. Afr. 4, 2, p. 101, says "I cannot distinguish generally the larger-flowered and -fruited specimens which have been regarded as forming a distinct genus *Operculina*. The transverse dehiscence of the fruit is not general in this small group". Hallier [in Meded. Rijksherbarium Leiden 1 (1910), p. 21] agreed that some species he had previously referred to *Operculina* should be put back into *Merremia* such as *M. kentrocaulos*. Van Ooststroom (op. cit., p. 327) has pointed out that in some species of *Merremia*, such as *M. tuberosa* (L.) Rendle, the wall of the capsules, becomes detached as a whole at its base from the receptacle. In *Operculina* the "operculum" is formed by the epicarp only, leaving the membranous endocarp (see figure 32 in Fl. Males. Ser. 1, 4:4, p. 455) so that, according to him (the latest monographer), there is no reason to unite *Merremia* and *Operculina*.

The only record in South Africa of a species of *Operculina* is *Ipomoea saundersiana* Baker in Fl. Cap. 4, 2 (1904), p. 60, which was based on *Wood* 1635, a specimen taken from a cultivated plant in the Durban botanical garden, which had been raised from seeds received from a Mrs. Saunders. Wood later gave a detailed description and a plate of the cultivated specimen in question in Natal Pl. 4 (1906), t. 353 and 354 and remarked that the seeds had come "from the interior of Africa". The plate in question, and a duplicate of *Wood* 1635 (in NH) clearly show that *Ipomoea saundersiana* Baker is a species of *Operculina*, and all the available evidence indicates that it is identical with *Operculina turpethum* (L.) S. Manso, the only species of *Operculina* occurring in Central Africa as far as I know.

Operculina turpethum has never been collected in the wild state in South Africa, and I do not think it has ever been cultivated there outside the Durban botanical garden. The species is only put on record here because of its inclusion (as *Ipomoea saundersiana*) in Fl. Capensis.

13. ASTRIPOMOEA

A. Meeuse, nom. nov.—*Astrochlaena* Hall. f. in Engl. Bot. Jahrb. 18 (1893), p. 120; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 68; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 118; Phillips, Gen. S. Afr. Flow. Pl., Ed. 2 (1951), p. 623; Meeuse in Taxon 4·8 (1955), p. 198, non *Asterochlaena* Corda (1845), nec *Asterochlaena* Garcke (1850).

Type species: *Ipomoea lachnosperma* Choisy = *Astrochlaena lachnosperma* (Choisy) Hall. f. = *Astripomoea lachnosperma* (Choisy) A. Meeuse (proposed in Taxon 4·8 (1955), p. 199 sub. *Astrochlaena*). Hallier mentioned several species when he described his genus *Astrochlaena*, the first being *Astrochlaena floccosa* (Vatke) Hall. f. As, however, the latter is not a very well known species and may well be conspecific with other previously described species, the earliest species described, viz. *A. lachnosperma* (*Ipomoea lachnosperma* Choisy), a wide-spread and well-known species, was selected as the type species.

The name *Astrochlaena* Hall. f. is invalidated by *Asterochlaena* Corda, a name given to a fossil "fern" stem (*Astrochlaena* and *Asterochlaena* are clearly only orthographic variants).

It is also invalidated by *Asterochlaena* Garcke, a synonym of *Pavonia* L. (Malvaceae). There was certainly a case for the conservation of *Astrochlaena* Hall f. against *Asterochlaena* Garcke (see Taxon 4, 8), but the name of the fossil genus is well-known in palaeobotany, is mentioned in recent text books on fossil botany, has apparently no recognised older synonyms and was properly described, so that a new name for the Convolvulaceous genus is inevitable.

Erect to decumbent, sometimes prostrate but never climbing, *annual* or *perennial herbs* or *undershrubs*, covered with soft stellate hairs on all vegetative parts, peduncles, bracteoles, pedicels and sepals. *Stems* usually simple or branched upwards, often firm to stout. *Leaves* petiolate, usually ovate, oblong to subcordate, entire to coarsely dentate-sinuate. *Inflorescences* cymose, few to many-flowered or by reduction occasionally 1-flowered; cymes axillary but often forming terminal leafy panicles at the apices of the stems; long or short; bracteoles often small; pedicels usually short. *Sepals* 5, usually more or less unequal, often ovate or oblong to lanceolate; outer ones often subcarinate on the back. *Corolla* funnel-shaped, but the limb spreading, almost entire: midpetaline areas well defined. *Stamens* included, unequal in length; filaments filiform or linear; anthers oblong, somewhat lobed or sagittate at the base, sometimes covered with swollen hairs; pollen spherical, spinose. *Disc* annular at the base of the ovary. *Ovary* 2-celled, with 2 ovules in each cell; style simple, included; stigmas 2, thick, oblong. *Fruit* a dehiscent usually glabrous capsule. *Seeds* usually 4, usually covered with a velvety or cobwebby to villous tomentum; embryo straight; cotyledons flat, broad, deeply bilobed; endosperm scanty.

Three species in South Africa:

Corolla up to 2 cm. long; its tube purple, the limb white..... 1. *A. lachnosperma*.

Corolla 2·5–5 cm. long, concolorous (purple, mauve or magenta):

Corolla 2·5–4 cm. long; leaves usually ovate, cuneate to rounded at the base; seeds very minutely velvety-pulverent; East Africa to Natal 2. *A. malvacea*.

Corolla 4·5–5 cm. long; leaves broadly ovate to rotundate, shallowly and broadly cordate to rounded at the base; seeds distinctly villous; only recorded from S.W. Africa..... 3. *A. rotundata*.

1. *A. lachnosperma* (Choisy) A. Meeuse, comb. nov.—*Ipomoea lachnosperma* Choisy in DC., Prodr. 9 (1845), p. 356. *Astrochlaena lachnosperma* (Choisy) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 121; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 119; N. E. Brown in Kew Bull. 1909, p. 124; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 213.

Type: *Kotschy* 260 (from Kordofan) in herb. Geneva (isotypes in JE, L, PRE).

Perennial. Stems erect, up to at least 1.25 m. high, covered with pale fawn to whitish stellate tomentum, as are petioles, peduncles, pedicels and calyces, firm, becoming woody and glabrescent at the base. Leaves ovate, varying to broadly elliptic, ovate-lanceolate or subrhomboid, entire to slightly or occasionally distinctly repand, 3–10 (–15) cm. long and 2–8 (–12) cm. wide; rounded or truncate to broadly cuneate at the base, usually gradually narrowing into an acute or acuminate to subaristate apex, thinly covered with white stellate hairs above, more densely so and paler beneath; petiole 1–5 cm. long. Flowers solitary or umbellate; peduncles short, usually under 1 cm. long; pedicels usually shorter than the peduncle; sepals ovate-lanceolate, acuminate-aristate, 6–8 mm. long. Corolla cream to white with purple in the tube inside, funnel-shaped, about 18 mm. long. Capsule globose, glabrous, 6–8 mm. in diam. Seeds villous-silky.

From Eritrea to Nigeria and southward, extending into South West Africa and Bechuanaland.

SOUTH WEST AFRICA.—Grootfontein, Abenab: *Dinter* 7399 (PRE, BOL); *Schoenfelder* S639 (PRE).

BECHUANALAND.—Kwebe Hills: *Lugard* 91 (K, t. N. E. Brown). N'gamiland: *Curson* 408 (PRE).

2. *A. malvacea* (Klotzsch) A. Meeuse, comb. nov. *Breweria malvacea* Klotzsch in Peters, Reise Mossamb., Bot. (1861), p. 245, t. 367. *Astrochlaena malvacea* (Klotzsch) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 121; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 69; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 121; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 213; Brenan in Mem. New York Bot. Garden 9 (1954), p. 8.

Type: *Peters* s.n. in herb. Berlin from Inhambane, Portuguese E. Africa (now destroyed). If no isotype is extant in another herbarium, the plate (t. 367) in Peters, Reise Mossamb., must be taken to represent the type.

Perennial. Stems 60–200 cm. long, erect, ascending or decumbent, firm, more or less densely clothed with short whitish to fawn pubescence, glabrescent and becoming woody at the base. Leaves usually ovate, sometimes varying to broadly ovate, ovate-lanceolate or subrhomboid, 3–8 (–12) cm. long and 2–5 (–8) cm. wide, entire or repand, rounded, truncate or sometimes somewhat cuneate at the base, acuminate to rounded at the apex, dull green drying brownish and sparsely stellate-hairy to glabrescent above, matted with white stellate tomentum beneath; petioles varying considerably in length, but usually much shorter than the corresponding blades, densely stellate-hairy as are peduncles, pedicels and calyx. Inflorescences axillary and terminal, often forming a leafy panicle at the tops of the stems, peduncles rather slender, lower ones up to 12 cm. long, upper ones usually much smaller, erect to patent, subumbellately 1- to few-flowered; bracteoles minute, early deciduous, pedicels 5–15 (–20) mm. long, distinctly subclavate. Sepals elliptic to ovate, acute to obtuse, 6–8 (–10) mm. long. Corolla funnel-shaped, described as mauve or purple (probably bright magenta), 2.5–4 cm. long and the limb up to 5 cm. in diam., glabrous or nearly so. Capsule globose or somewhat ovoid, glabrous, 6–12 mm. long, 6–9 mm. in diam. Seeds minutely velvety-pulverulent with a tuft of fawn hairs round the hilum.

From West Tropical Africa eastwards and extending into Natal.

Recorded from the coastal zones of Zululand and Natal as far south as Durban, in the northernmost part fairly common (St. Lucia Bay, Richard's Bay, etc.).

3. *A. rotundata* (Pilger) A. Meeuse, comb. nov. *Astrochlaena rotundata* Pilger in Engl. Bot. Jb. 45 (1910), p. 222; Dinter in Fedde, Repert. 15 (1918), p. 345.

Type: Not designated, because Pilger mentioned two specimens (*Dinter* 817 and *Dinter* 817a). The original type specimens in the Berlin Herbarium having been lost, I consider *Dinter* 817 in SAM to be the neo-type.

Probably *perennial*. Stems prostrate, up to at least 1·20 m. long, firm and stout, densely covered with a short stellate brown tomentum, as are petioles, main veins of lower surface of leaves, peduncles, pedicels and calyx. Leaves broadly ovate-subcordate to almost orbicular-subcordate, 4–8 cm. long and 3–7 cm. wide, entire or somewhat repand, rounded, truncate, subcordate to subcuneate at the base, acute to subacute at the apex and often with a short mucro, rather thinly stellate-hairy above, more densely so between the prominent veins and distinctly paler below; petiole 1–5 cm. long. Peduncles mainly axillary, 4–7 cm. long, 1–3-flowered; bracteoles small, early deciduous; pedicels subumbellate, 1–2·5 cm. long. Sepals ovate-lanceolate or elliptic, obtuse, sometimes mucronate, 10–12 mm. long, the inner ones narrower and more acute. Corolla funnel-shaped, “bright purple”, 4·5–5 cm. long; the limb about as much in diam. Capsule subglobose to ovoid, glabrous, 10–12 mm. long and about 10 mm. in diam. Seeds densely and shortly villous.

SOUTH WEST AFRICA.—Grootfontein, Otavi. Auros: *Dinter* 5617 (NH, PRE, SAM, L), Otavi: *Dinter* s.n. (herb. no. SAM 61986). Aukas-Kreyfontein: *Dinter* 817 (SAM, type!).

Notes.—The specimens cited above were distributed by Dinter under the name *Astrochlaena rotundata* and agree very well with the description and with *Dinter* 817 in SAM. The hitherto undescribed capsule resembles that of *A. malvacea* very much, but the seeds are covered with a villous, buff-brown or drab pubescence.

A. rotundata resembles *A. malvacea* and possibly some other species, but it is distinct from *A. malvacea* in the leaf-shape, its larger flowers and the distinctly pubescent seeds. I cannot identify *A. rotundata* with any other described species and it seems to be endemic in South West Africa.

14. IPOMOEA

L. [Sp. Pl. Ed. 1 (1753), p. 159]; Gen. Pl., ed. 5 (1754), p. 76; Choisy in DC., Prodr. 9 (1845), p. 348; Benth & Hook., Gen. Pl. 2 (1876), p. 870; Peter in Engl. & Prantl., Natürl. Pfl. fam. ed. 1, 4·3a (1891), p. 28; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 583 and 18 (1893), p. 123; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 46; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 128; Ooststr. in Blumea 3 (1940), p. 481, and in Steenis, Fl. Males. ser. 1, 4·4 (1953), p. 461; Phillips, Gen. S. Afr. Flow. Pl. ed. 2 (1951), p. 624. *Pharbitis* Choisy in Mém. Soc. Phys. Genève 6 (1833), p. 441 and in DC., Prodr. 9 (1845), p. 345; Peter, op. cit., p. 31. *Calonyction* Choisy, op. cit. (1838), p. 441 and (1845), p. 345; Peter op. cit., p. 26; Hall. f. in Engl. Bot. Jb. 16 (1893), p. 583 and 18 (1893), p. 153. *Rivea*, Choisy in DC., Prodr. 9 (1845), p. 325; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 155; Phillips, Gen. S. Afr. Flow. Pl. ed. 2 (1951), p. 624, pro parte, exclus. type; non *Rivea* Choisy in Mém. Soc. Phys. Genève 6 (1833), p. 407, nec. Hall. f. in Engl. Bot. Jb. 16 (1893), p. 584.

Type species: *I. pes-tigridis* L., Sp. Pl. Ed. 1 (1753), p. 162 (*fide* Phillips 1951).

Annuals or *perennials*, herbaceous, suffruticose or sometimes woody, usually twining or prostrate, rarely floating or erect. *Leaves* varying in shape and size, entire, lobed, or deeply divided, often cordate at the base, petiolate or rarely sessile. *Inflorescences* axillary, cymose, but sometimes dense and pseudo-capitate, few- to many-flowered but not infrequently 1-flowered by reduction; the cymes rarely forming a terminal leafy panicle: peduncles short or long, rarely almost 0; bracteoles various, usually small, linear or lanceolate, sometimes leafy and/or forming an involucrem; pedicels usually distinct, sometimes long, occasionally very short. *Sepals* 5, herbaceous to subcoriaceous, often ovate or lanceolate, linear or elliptic, obtuse to aristate, unequal or equal, glabrous or hairy, persistent, often more or less enlarged in fruit. *Corolla* small to large, usually quite regular, rarely faintly zygomorphic, usually funnel-shaped or the tube somewhat campanulate, sometimes hypocrateriform; the limb shallowly, occasionally deeply 5-lobed; midpetaline areas well defined by 2 distinct nerves, often hairy towards their tips. *Stamens* 5, usually unequal, inserted near the base of the corolla-tube, subincluded or sometimes exerted; filaments filiform or somewhat linear, often dilated and hairy or papillate at the base; anthers ovate to linear; pollen globose, spinulose. *Disc* annular. *Ovary* usually 2- or sometimes 4-celled, 4-ovuled, rarely 3-celled and 6-ovuled; style filiform (sub)-included to exerted; stigma capitate entire or often 2-3-globular. *Capsule* globose to ovoid, dehiscent by 4, rarely 6 valves. *Seeds* as many as the number of ovules, or less by abortion, glabrous or hairy.

Circumtropical.

The generic limits are in agreement with Van Ooststroom's latest treatment of the genus (1953). The genera *Calonyction* Choisy and *Pharbitis* Choisy (and *Quamoclit* Moench, which is only represented in Southern Africa by cultivated species) have been reduced to its synonymy. Hallier in Meded. Rijksherb. Leiden 46 (1922), p. 19-20 had already reduced *Calonyction* (and *Quamoclit*) to subsections of *Ipomoea* section *Leiocalyx*. Van Ooststroom (1940) followed him, but later (1953) placed them as separate sections under *Ipomoea* next to *Leiocalyx*.

On the other hand, as in the system of the Convolvulaceae much importance is attributed to the structure of the fruit and of the pollen, many species described under *Ipomoea* have to be referred to other genera such as *Merremia* and *Operculina* (with smooth pollen), and *Stictocardia*, *Turbina* and *Argyreia* (with indehiscent or only partly dehiscent fruits). The genus *Rivea* as defined by Choisy in 1833 was later extended by himself (1845) and by Hallier in Engl. Bot. Jb. 18 to include many more species which do not agree with the original diagnosis, because they have bi-globose instead of the oblong stigmas of the type species of *Rivea*, or dehiscent capsules instead of the indehiscent fruit of *Rivea*. Van Ooststroom in Blumea 5 (1953), p. 353-355 has pointed out that Hallier's later conception of *Rivea* contained a mixture of heterogeneous elements, which have to be referred partly to *Rivea* proper (two species in south-east Asia and Ceylon), partly to *Turbina* or *Argyreia* (those forms which have a bi-globose stigma and indehiscent fruits) and partly to *Ipomoea* sect. *Eriospermum*. The single species of "*Rivea*" mentioned by Phillips in the second edition of his "Genera" [i.e., *Rivea adenoides* (Schinz) Hall. f.], is an example of the last group: its dehiscent capsule excludes it from *Rivea* and its seeds with very long hairs, together with its other characters, indicate that it belongs to *Ipomoea* sect. *Eriospermum* and its original name *Ipomoea adenoides* Schinz has to be restored. For a more detailed discussion see Van Ooststroom (1943), l.c., and under *Turbina* on p. 774.

The sections of *Ipomoea*, as indicated by Hallier in Engl. Bot. Jb. 18 (1893), have been adopted by several authors, and are, with only few changes, maintained by Van Ooststroom in Flora Males. Ser. 1, 4·4 (1953).

The species are arranged below in practically the same sequence as indicated by Hallier, although it seems doubtful if they are all correctly placed in the proper section. I made an exception for *I. pellita* which Hallier placed in his section *Dasychaetia*, but to my mind, is perhaps much more closely related to species of section *Calycanthemum*, such as *I. crassipes*.

Species not mentioned by Hallier I have tentatively referred to sections, although it is difficult to place some of them satisfactorily. *I. ommaneyi*, for instance, shows characters of section *Calycanthemum* (habit) and of *Pharbitis* (inflorescence).

The South African species are referable to the following sections:—

Calycanthemum (Klotzsch) Hall. f. (spec. 1–9).

Pharbitis (Choisy) Griseb.

 subsection *Chorisanthae* Hall. f. (spec. 11–15).

 subsection *Cephalanthae* (Choisy) Hall. f. (spec. 16–22).

Batatas (Choisy) Griseb. (spec. 23).

Leiocalyx Hall. f. (spec. 24–40).

Calonyction (Choisy) Griseb. (spec. 41).

Eriospermum Hall. f. (spec. 42–47).

The species of *Turbina* being very similar to *Ipomoea* in floral characters, are included in the key to the species of *Ipomoea* because fruiting specimens are not always available.

A₁ Leaves simple, entire, lobed, emarginate or toothed, but not pinnately, palmately or pedately lobed nearly to the base nor compound:

Flowers in pedunculate heads, surrounded by a single large bicuspidate bract:

Sepals lanceolate, acute, glabrous or sparsely hairy, mainly at the tips and along the margins; corolla distinctly funnel-shaped 3–5 cm. long, the limb 3–5 cm. in diam..... 21. *I. involucrata*.

Sepals oblong-spathulate to oblong, obtuse, glabrous below the tips inside, in fruit recurved and showing the glabrous surface outside; corolla-tube slender, subcylindric, 2–3 cm. long; the limb spreading, 1–3 cm. in diam..... 22. *I. pileata*.

Flowers not in heads, or, if so, heads not subtended by one large and bicuspidate boat-shaped bract:

B₁ Corolla narrowly to widely funnel-shaped:

Leaves with minute black dots beneath; sepals about 8 mm. long, much imbricate, subequal, glabrous, obovate, obtuse (Zululand) see *Stictocardia*.

Leaves without black dots (sometimes minutely pitted or pellucidly glandular):

C₁ Corolla small, under 18 mm. long and or its limb less than about 15 mm. in diam., in fascicles, clusters or solitary, sometimes in pedunculate 1- to few-flowered cymes or heads:

Leaves when dry pellucidly glandular when seen in transmitted light, crisped along the margin; peduncles 0–2 mm. long; pedicels short, only up to 2 cm. long in fruit; sepals very unequal, outer ones ovate from cordate base, obtuse, inner ones lanceolate, outer ones markedly accrescent, crisped along the margin; corolla about 16 mm. long, mauvish-pink; capsule and seeds hairy..... 5 *I. hackeliana*.

Leaves not pellucidly glandular:

Flowers in distinctly pedunculate, bracteate, dense heads; peduncle over 2 cm. long; leaves entire, elliptic to linear-oblong, obtuse, tomentose beneath; corolla slightly longer than the about 6 mm. long calyx, pale yellow; erect to trailing annual..... 16. *I. chloroneura*.

Flowers not in pedunculate bracteate heads; if fascicled or clustered, peduncles never longer than 2 cm.:

Leaves, at least the majority, hastate at the base with entire or toothed basal auricles, very rarely all lanceolate; flowers solitary, rarely fasciculate; peduncles 0; pedicels 6–10 (–30) mm.; sepals linear, acuminate, equal, erect, hairy, 6–12 mm. long; corolla pinkish mauve with darker centre, occasionally white; capsule hirsute..... 4. *I. gracilisepala*.

Leaves cordate, cuneate or truncate at the base, never hastate:

Leaves usually 3-lobed, albotomentose beneath, flowers mauve-purple, in pedunculate dichasial 3–11-flowered cymes..... 13. *I. arachnosperma*.

Leaves entire, not albotomentose:

Leaves cuneate to truncate-rounded, rarely subcordate at the base; flowers very small, sessile; corolla hardly longer than the usually bristly calyx, white 1. *I. coscinosperma*.

Leaves distinctly cordate at the base:

Peduncles distinct, slender, over 1 cm. long, cymosely 1–3-flowered; pedicels distinct; outer sepals subcordate at the base, attenuate into an acute apical portion, inner sepals narrower; corolla about twice as long as the calyx, its tube sub-cylindric, 12–16 mm. long..... 7. *I. sinensis*.

Peduncles 0 or short and thick; flowers solitary, binate in axial clusters or fasciculate; corolla a little longer than the calyx*:

Flowers usually in clusters, practically sessile; sepals very hairy, ovate-lanceolate with linear-acuminate, spreading tips; capsule hairy; seeds glabrous..... 2. *I. eriocarpa*.

Flowers usually binate, pedicellate; sepals obtuse or subacute, ciliate or nearly glabrous, sometimes thinly bristly outside; capsule glabrous or with a few bristly hairs; seeds densely pubescent..... 3. *I. plebeia*.

C₂ Corolla larger to very large, over 18 mm. long; flowers usually pedunculate:

Leaves bilobed at the apex, coriaceous or subcoriaceous, the whole plant glabrous; stems stout, trailing; growing only on sandy beaches..... 31. *I. per-carum*.

Leaves not bilobed (sometimes emarginate) at the apex, or not found on sandy beaches:

Leaves cordate-ovate in outline, shallowly 3-lobed, or entire, cordate, cordate-ovate or cordate-deltoid, covered with a thin white cobwebby tomentum beneath (this tomentum occasionally reduced to a few scattered floccose patches); flowers mauve or magenta; bracteoles and sepals lanceolate or linear-lanceolate, acute to acuminate-aristate:

Flowers in dense globose pedunculate heads; corolla 2–3 (–4) cm. long..... 14. *I. wightii*.

* Compare the footnote on p. 722 regarding *I. leucanthemum*.

Flowers in few- to many-flowered dichasia or cymes, sometimes solitary; if peduncles and pedicels very short, flowers few and corolla 3–5 cm. long:

Corolla 18–25 mm. long..... 13. *I. arachnosperma*.

Corolla 30–50 mm. long..... 15. *I. ficifolia*.

Leaves either not with a white cobwebby tomentum or bracts and sepals different (and corolla white or pale mauve):

D₁ Leaves linear or lanceolate with narrow or sometimes somewhat rounded base, entire or sometimes toothed, repand, lobed or more or less emarginate; plants erect to prostrate, often suffruticose:

Vegetative parts pubescent; calyx tomentose or pubescent:

Vegetative parts (at least on the younger shoots) and calyx usually covered with an adpressed, short and silvery pubescence; if only densely hairy sepals subequal..... see *Turbina*.

Vegetative parts usually not with an adpressed short and silvery tomentum, or sepals very unequal:

Sepals unequal; plant hairy . . . compare extreme forms of 8. *I. crassipes*.

Sepals equal or subequal:

Sepals acuminate to aristate, leaves usually long-attenuate at the base and well over 5 cm. long, usually also some toothed or pinnatisect leaves present; leaves hairy or glabrous above; pubescence soft, white..... 6. *I. oenotherae*.

Sepals acute or acuminate; leaves under 5 cm. long, on a short petiole or nearly sessile, glabrous above, pubescence soft, white..... see *Turbina robertsiana*.

Sepals acute or acuminate; leaves usually over 5 cm. long, hairy above and below; pubescence usually stiff, adpressed on the leaves, yellowish or brownish..... see *Turbina oblongata*.

Vegetative parts (at least the leaves) glabrous, stems occasionally minutely scabrid-hirsutulous:

Corolla white, 20–25 mm. long; plant stemless or with a very short stem; leaves entire or with a few teeth..... 32. *I. simplex*.

Corolla magenta or pale mauve with darker centre, over 25 mm. long:

Leaves usually over 5 mm. wide; corolla pale mauve with darker centre; stems usually stout, sometimes minutely scabrous or hirsutulous..... 33. *I. welwitschii*.

Leaves usually less than 5 mm. wide; corolla magenta; stems often slender, glabrous, terete..... 34. *I. bolusiana*.

D₂ Leaves broader, not linear or lanceolate or, if narrow, broadly truncate, hastate, sagittate or cordate at the base:

E₁ Annual or perennial plants, herbaceous, prostrate or climbing, sometimes suffruticose and suberect but, if so, under 50 cm. high, never tall and woody:

Stems trailing, firm, often rooting at the nodes; leaves broadly ovate to suborbicular, entire, angular, or 3–7-lobed; peduncles 3–18 cm. long, stout, angular; pedicels 0.3–1.2 cm. long; sepals equal and 7–8 mm. long or inner ones longer, 9–12 mm.; corolla glabrous, pale mauve, 30–45 mm. long; ovary usually hairy; cultivated for its edible tubers and occasionally found as a culture relic..... 23. *I. batatas*.

Plant not cultivated for its edible tubers (sometimes as an ornamental):

Stems thick, trailing, hollow or spongy, rooting at the nodes; leaves linear to ovate with cordate, hastate, sagittate or truncate base, entire or with dentate basal auricles, glabrous, 3-15 cm. by 1-9 cm.; inflorescence cymosely 1- to few-flowered; peduncles 1-12 cm. long; bracts minute; pedicels 2-6.5 cm. long; calyx 7-8 mm. long, glabrous; corolla pink or pale mauve, often with darker centre, glabrous, 3-5 cm. long; in moist, marshy inundated localities or even completely aquatic, floating..... 30. *I. aquatica*.

Stems not thick, hollow or spongy or rooting at the nodes and plant not usually found in very moist localities:

F₁! Leaves distinctly cordate or sagittate at the base:

Corolla either pale yellow, concolorous, or white or yellow with a purple zone at the base of the corolla-tube inside, 15-30 mm. long; sepals subequal, 6-8 mm. long..... 24. *I. obscura*.

Corolla pink, mauve, magenta, purple to blue or pure white, if white or yellowish with purple or magenta centre, sepals very unequal and over 8 mm. long:

G₁ Sepals entirely glabrous:

Petiole short, under 15 mm. long; leaves usually under 4 (-5) cm. long; plant usually hairy in some part other than the calyx; corolla with small tufts of hairs protruding from the midpetaline areas (especially conspicuous in older buds)..... 25. *I. transvaalensis*.

Petioles 15-200 mm. long:

Herbaceous, quite glabrous twiner; leaves cordate, entire, long-acuminate; stems and peduncles fistulose; inflorescence cymosely few- to many-flowered; calyx 4.5-6 mm. long; corolla 4-6 cm. long, violet, purple or (in S. Africa usually) bright blue with a white tube; cultivated and occasionally found as an escape.... 35. *I. tricolor*.

Plants not cultivated, corolla never blue:

Leaves cordate-elliptic or rounded to subreniform, obtuse with minute cusps; basal sinus narrow and deep; sepals obtuse, 12-18 mm. long; corolla pale mauve with magenta centre, 3-6 cm. long.... 26. *I. bathycolpos*.

Leaves cordate-deltoid or cordate-ovate, usually suddenly acuminate from a broad, usually irregularly and coarsely few-toothed base into an entire apex; basal sinus broad; sepals 6-8 mm. long; corolla magenta, 2-3 cm. long..... 27. *I. papilio*.

G₂ Sepals thin to densely hairy or tomentose:

Sepals long-attenuate or linear-acuminate at the apex, 14–25 mm. long; twining herbaceous plants with retrorse hairs on stems and petioles; leaves often 3-lobed; often cultivated:

Outer sepals lanceolate at the base with long and linear acumen, patently hirsute in the basal portion, 17–25 mm. long; cultivated..... 10. *I. nil*.

Outer sepals lanceolate to ovate-lanceolate, gradually attenuate towards the apex, with adpressed pubescence, 14–22 mm. long; wild and cultivated.... 12. *I. congesta*.

Sepals acute, obtuse or mucronate but not with a long and narrow acumen, if sepals long-acuminate, plant not twining and without retrorse hairs on stems and petioles:

Calyx with bristly patent hairs in basal portion, glabrous towards the apex; twining annual with retrorse hairs on stems and petioles..... 11. *I. purpurea*.

Calyx not with bristly patent hairs in basal portion and glabrous towards the apex:

Twining plant, growing in moist places (river banks, marshes, pools), often among reeds, sedges, *Papyrus*, etc.; petioles 3–12 cm. long; peduncles 2–12 cm. long; carrying one to few flowers in a subumbellate cyme; calyx 7–10 mm. long, corolla 4–6 cm. long, mauve (Okavango marshes, tropical Africa)..... 42. *I. riparia*.

Prostrate to suberect plants, or an erect shrub:

Plants prostrate to suffruticose, if suberect never more than 50 cm. high, corolla usually magenta:

Bracteoles usually close to the calyx, linear or lanceolate, rarely broader; sepals subequal... see *Turbina oblongata*.

Bracteoles usually distant from the calyx, often foliaceous; sepals very unequal: outer ones from a broad base ovate-acuminate; inner ones much narrower, linear from an ovate or elliptic basal portion..... 8. *I. crassipes*.

Plant shrubby, erect; stems woody; sepals very broad, unequal; corolla pale mauve with magenta centre..... see *Turbina holubii*.

F₂ Leaves not distinctly cordate or sagittate at the base:

Sepals entirely glabrous, sometimes rugose or muriculate:

Sepals 6–8 mm. long, corolla magenta, leaves acuminate from a broad base, coarsely toothed in lower half..... 27. *I. papilio*.

Sepals 10–16 mm. long; corolla pale mauve with darker centre; leaves linear-oblong to elliptic, entire emarginate, or 3-lobed, not broad or toothed at the base..... 33. *I. welwitschii*.

Sepals (12–) 16–22 (–25) mm. long; corolla magenta; leaves oblong, elliptic, ovate to linear-oblong, entire...
glabrous specimens of *Turbina oblongata*.

Sepals more or less hairy to tomentose:

Plant shrubby, erect, over 50 cm. high; sepals very broad, suborbicular, rounded, unequal, inner ones larger..... see *Turbina holubii*.

Plants prostrate; sometimes suffruticose, suberect but if so, under 50 cm. high and sepals not very broad and rounded:

Flowers in pedunculate, few- to many-flowered heads (heads occasionally binate):

Bracteoles and sepals linear, narrow, bristly; bracteoles (15)–20–30 mm. long; sepals 20–35 mm. long; petioles usually over 2 cm. long; leaves ovate or ovate-oblong, mostly or all under 9 cm. long..... 9. *I. pellita*.

Bracteoles and sepals lanceolate to ovate:

Leaves lanceolate or ovate-lanceolate from a broad base to long-triangular, gradually narrowed towards the apex, up to 30 cm. long and 10 cm. wide; petioles usually very short; corolla bright magenta, 3–5 cm. long, densely silky on the mid-petaline areas..... 17. *I. ommaneyi*.

Leaves usually oblong to ovate and not often gradually tapering to the apex from a broad base, petioles usually over 1 cm. long; corolla magenta, 5 cm. long or longer, usually not densely silky but thinly strigose on the mid-petaline areas 18. *I. atherstonei*.

Flowers solitary or 2 (–3) together, or not in heads but in cymes:

Sepals very unequal; outer ones ovate or lanceolate from a broad, sometimes subcordate base, inner ones linear from a short elliptic or ovate basal portion; bracteoles usually distant from the calyx and often foliaceous 8. *I. crassipes*.

Sepals equal or not so distinctly unequal:

Leaves up to 4 (–5) cm. long, broad at the base, often subcordate; bracteoles very minute, calyx 6–8 mm. long; corolla bright magenta-rose-colour, 2–3 cm. long with small tufts of hairs protruding from the midpetaline areas (especially conspicuous in older buds)..... 25. *I. transvaalensis*.

Leaves, bracts, sepals or corolla longer or corolla, if hairy on the midpetaline areas without protruding hair-tufts:

Leaves oblong to narrowly ovate, often crisped along the margin, up to about 3·5 cm. long; the apex often reflexed, mucronate; pubescence soft, spreading, white, the hairs never silky, not yellowish or brown, lower surface of leaves and calyx neither densely hairy nor almost tomentose; stems and peduncles usually slender:

Bracteoles distant from, more rarely contiguous to the calyx; leaves quite glabrous above; corolla of open flowers thinly hairy to glabrous on the midpetaline areas (Transvaal)..... see *Turbina robertsiana*.

Bracteoles contiguous to the calyx; leaves usually hairy on both sides; corolla of open flowers silky on midpetaline areas (Eastern Cape)..... 28. *I. crispa*.

Leaves usually well over 3·5 cm. long, rarely crisped along the margins; pubescence often hirsute (or stiffly strigose on the leaves); the hairs not infrequently yellow or brown, or occasionally silky-tomentose on lower surface of leaves, sepals and sometimes the midpetaline areas of the corolla see *Turbina*.

E₂ Tall perennial woody climbers or shrubs over 50 cm. high:

Calyx glabrous:

Sepals orbicular to oblong, obtuse; leaves usually lobed, rarely entire..... 43. *I. digitata*.

Sepals ovate, cuspidate to acute; leaves entire, usually appearing after the flowers..... 46. *I. shirambensis*.

Calyx (at least partly) hairy or tomentose:

Sepals broadly elliptic or obovate to orbicular, obtuse, 6–10 mm. long, the two inner ones conspicuously larger and usually longer than the outer ones; leaves cordate-ovate, usually under 5 cm. long, petioles slender; erect shrub with the ultimate twigs sometimes flexuous or twining..... see *Turbina holubii*.

Sepals not as above; plants climbing, leaves usually much larger, young parts densely tomentose, as are the peduncles:

Young leaves with very conspicuous reticulate, somewhat floccose tomentum on the main veins beneath, older ones glabrescent; calyx at first tomentose at least near the base; corolla white, 6–8 cm. long (an eastern species) 44. *I. albivenia*.

Young leaves with a complete tomentum beneath, tomentum usually persistent; calyx tomentose; corolla pale mauve, 6–10 cm. long (a western species)..... 45. *I. verbascoidea*.

- Young leaves with a short silvery tomentum beneath; tomentum usually persistent; flowers in a terminal panicle; calyx silvery-tomentose; corolla white, about 2 cm. long..... see *Turbina shirensis*.
- B₂** Corolla hypocrateriform, completely white or white with the inside of the tube purple or magenta:
- Plant woody and climbing; calyx glabrous, sepals obtuse..... see *Turbina stenosphon*.
- Plant shrubby, erect; calyx densely silky outside..... 47. *I. adenioides*.
- Plant herbaceous, twining:
- Corolla-tube up to about 35 mm. long; leaves ovate to lanceolate, entire, cuneate to rounded at the base; sepals not awned.. 29. *I. lapathifolia*.
- Corolla-tube at least 6 cm. long; leaves cordate at the base, entire or 3-lobed; sepals awned..... 41. *I. alba*.
- A₁** Leaves deeply lobed (nearly to the base), dissected or compound:
- Leaves albo-tomentose beneath with the veins marked out, palmately 3-5 or almost 7-lobed..... 19. *I. magnusiana*.
- Leaves glabrous or sometimes hairy but not albo-tomentose:
- Flowers in dense pedunculate and bracteate heads; leaves hairy..... 20. *I. pes-tigridis*.
- Flowers solitary, fascicled or in cymes:
- Corolla small, white tinged with mauve, 10-15 mm. long; leaves palmately 5-fid with dentate or serrate to pinnatisect segments 36. *I. coptica*.
- Corolla usually larger, rarely white; leaf-segments not dentate or serrate, entire or the basal ones with a lateral lobe:
- Large glabrous perennial climber; leaves palmately (3-) 5-7 (-9)-lobed, 6-14 cm. by 6-16 cm., not pseudostipulate; sepals orbicular or the outer ones narrower, obtuse, 6-12 mm. long; corolla 5-6 cm. long, pale mauve, the tube darker inside.. 43. *I. digitata*.
- Annuals or prostrate perennials, leaves much smaller, usually under 8 cm. in diam. and often pseudostipulate by the small leaves of developing or suppressed axillary shoots:
- Leaves usually pseudostipulate, distinctly palmately or pedately 5-9-fid, quite glabrous; climbing or occasionally prostrate annuals:
- Calyx 8-10 mm. long; outer sepals saccate at the base; corolla yellow with mauve tube, 3-6 cm. long and in diam.; leaves usually biternately pedate with often 9 segments 37. *I. dasysperma*.
- Calyx up to about 7 mm. long, outer sepals not saccate; corolla mauve, purple or white; leaves palmately partite with usually 5 segments:
- Corolla 3-6 cm. long and 4-6 in diam., mauve..... 38. *I. cairica*.
- Corolla up to about 25 mm. long:
- Peduncles very slender, filiform, corolla often under 16 mm. long, purplish-mauve..... 40. *I. heptaphylla*.
- Peduncles rather stout, not filiform, corolla 15-25 mm. long, purplish-mauve or white..... 39. *I. hochstetteri*.
- Leaves not pseudostipulate, pinnately dissected, tridentate or palmately compound; stems prostrate or rarely suberect from a perennial tuberous rootstock; corolla usually over 3 cm. long:
- Young parts and sepals with soft white hairs; sepals very acute; basal leaves, if present, linear; cauline leaves tridentate to pinnatisect or all leaves pinnatisect; flowers solitary on short peduncles, magenta (not cultivated)..... 6. *I. oenotherae*.

Sepals glabrous or, if hairy, flowers in 1- to few-flowered cymes on peduncles 3-18 cm. long and corolla pale mauve:

Leaves palmately (3-) 5-9-fid with linear segments under 5 mm. wide (often very narrow); corolla magenta; stems often rather slender, glabrous, terete..... 34. *I. bolusiana*.

Leaves trisect to palmately 5 (-7) sect with linear, lanceolate or oblong segments usually over 5 mm. wide; stems usually stout; flowers pale mauve:

Peduncles and pedicels very short, flowers solitary; corolla pale mauve with magenta centre (3-) 5-8 cm. long; plant not cultivated..... 33. *I. welwitschii*.

Peduncles 3-18 cm. long, flowers 1 or few, cymose; corolla pale mauve, 3-4.5 cm. long; plant cultivated for its edible tubers and occasionally found as a culture-relic 23. *I. batatas*.

1. *I. coscinosperma* Hochst. ex Choisy in DC., Prodr. 9 (1845), p. 354; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 124; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 138; Hutch & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 216.

Type: Not designated. Choisy mentioned *Kotschy* 17 and 376 (from Kordofan). There is a specimen of *Kotschy* 376 at Kew and this gathering is proposed here as the lectotype (actual holotype specimen in herb. Geneva).

Annual. Stems several from the apex of the main root, usually stout, often angular, thinly hairy, glabrescent, at first suberect but soon prostrate, up to several metres long (3 m. in fertile soil on the Springbok Flats). Leaves often secund, from linear-lanceolate to oblong, 3-12 cm. long, 0.5-5 cm. wide, entire or somewhat repand, acute when young, but later subacute to rounded at the apex, usually distinctly mucronate, usually gradually narrowed into a narrowly cuneate base, occasionally broadly cuneate to almost rounded at the base, sparsely strigose mainly on the nerves; petioles usually much thinner than the adjoining internodes, more or less thinly subhirsute 0.5-3 (-6) cm. long. Inflorescences consisting of few-flowered clusters on very short peduncles, on young stems solitary, or the short pedicels fasciculate; bracts linear-subulate, hairy, about 4 mm. long. Sepals covered with long, white, rather stiff hairs, sometimes only ciliate, ovate-lanceolate to lanceolate, attenuate into a linear-lanceolate narrow apex, more abruptly acuminate from an ovate base in fruit, subequal, the inner ones slightly narrower, 6-8 mm. long, in fruit up to 10 (-12) mm. long. Corolla slightly longer than the calyx, in all annotated specimens from southern Africa white, narrowly funnel-shaped. Capsule globose, glabrous, 6-8 mm. in diam., crowned by the persistent stylebase. Seeds very shortly pubescent, about 3 mm. long.

Abyssinia, Sudan, West Tropical Africa, Southern Rhodesia, Transvaal, Griqualand-West, South West Africa.

SOUTH WEST AFRICA.—Grootfontein, Tsumeb: *Dinter* 7607 (BOL, PRE); Grootfontein, *Schoenfelder* S560 (PRE); *de Winter* 2952 (PRE); farm Kumkauas: *Kinges* 2854 (in herb. Kinges; sepals quite glabrous), 2788 (PRE, sepals hairy); district unknown, Otjisambira (?) *Volk* 2929 (PRE).

CAPE PROVINCE.—Barkly West, Newlands: *Wilman* h. no. 3141 (KMG also BOL).

TRANSSVAAL.—Rustenburg: *Sinclair* s.n. (PRE). Brits: *Dyer & Verdoorn* 3424, v.d. *Linde* s.n., *Mogg* s.n. (all PRE). Pretoria, Roodeplaat: *de Wet* s.n.; nr. Rust de Winter: *Meeuse* 9526 (PRE). Waterberg, Warmbaths: *Munro* s.n. (PRE), *Meeuse* 9109 (PRE, L); *Marais* 262 (PRE, SRGH). nr. Naboomspruit: *Galpin* M. 530, M. 593 (PRE). Potgietersrust, Springbok Flats: *Pole Evans* 3937 (PRE). Letaba, Shingwedzi: v.d. *Schijff* 3867 (PRE). Nelspruit, Kaapmuiden: *Mogg* s.n. (PRE).

SOUTHERN RHODESIA.—Wankie: *Eyles* 1298 (SAM, SRGH).

Some of the plants cited above were compared by Mr. B. de Winter with Kotschy 376 at Kew. He reported that they agree with the Abyssinian *I. coscinosperma*, although the flowers in the South African specimens are always white and those of *I. coscinosperma* were reported to be red. However, there are specimens at Kew from Abyssinia with pink flowers and the colour of the flowers does not seem to be very important; in all essential characters the South Africa plants agree with the specimen Kotschy 376 and similar plants from Abyssinia and the Sudan.

I. coscinosperma is a very variable species. The leaves may vary from narrowly lanceolate to linear-oblong or oblong, but they are usually narrowed towards the base, which is cuneate or occasionally rounded to truncate, but (in the specimens seen) never distinctly hastate-sagittate as in *I. leucanthemum* (see below). The sepals vary from glabrous or glabrous with ciliate margin to densely hirsute. The form with glabrous sepals has been distinguished as var. *glabra* (e.g., in Fl. Trop. Afr.), but I do not think this variety can be upheld.

I. coscinosperma is closely related to *I. leucanthemum* (Klotzsch) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 124; Baker & Rendle, op. cit., p. 137 [= *Calycanthemum leucanthemum* Klotzsch in Peters, Reise Mossamb., Bot. 1 (1861), p. 244, t. 40], and I even thought that they might be identical. However, Dr. H. Wild (Salisbury) kindly pointed out to me that in his opinion they are distinct. He had collected specimens (*Wild* 4077 in SRGH and PRE) in Urungwe, Zambezi Valley, Menswa Pan (S. Rhodesia), not very far from the type locality of *I. leucanthemum*, which are an excellent match of the plate in Peters, Reise Mossamb. (t. 40). After having seen his specimen I fully agree with him. The differences are: (a) the leaves of the specimens under discussion are truncate to hastate-sagittate at the base and only up to about 5 cm. long; they are obtuse and minutely mucronate (in *I. coscinosperma* usually over 5 cm. long and often acute to acuminate and with a fairly long mucro); (b) the flowers appear to be solitary (they are almost invariably clustered in *I. coscinosperma*); (c) *I. leucanthemum* is a perennial, whereas *I. coscinosperma* is an annual. There may also be differences in the fruits and seeds but unfortunately the fruits of *I. leucanthemum* are not known. *I. leucanthemum* seems to be a rare and/or very local species (Lower Zambesi Valley).*

I. coscinosperma has been reported to be noxious in cultivated land in the Transvaal (Springbok Flats) by rapidly covering patches of ground with its long creeping stems.

2. *I. eriocarpa* R. Br., Prodr. Fl. Nov. Holl., ed. 1 (1810), p. 484; Choisy in DC., Prodr. 9 (1845), p. 369; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 136; Exell, Cat. Vasc. Pl. S. Thomé (1943), p. 250; Ooststr. in Steenis, Fl. Mal., Ser. I, 4·4 (1953), p. 462. *I. hispida* (Vahl) R. et S., Syst. 4 (1819), p. 238, non Zuccagni (1806); Hall. f. in Engl. Bot. Jb. 18 (1893), p. 123; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 216; Ooststr. in Blumea 3 (1940), p. 490. *Convolvulus hispidus* Vahl, Symb. Bot. 3 (1794), p. 29. *Jacquemontia thomensis* Henriq. in Bol. Soc. Broter. 10 (1893), p. 143 (fide Exell, l.c.); Baker & Rendle, op. cit., p. 86.

Type: Not seen.

Annual. Stems twining or prostrate, herbaceous, slender to rather stout, slightly striate, retrorsely to patently pilose, 1–2 m. long. Leaves herbaceous, thin, cordate-lanceolate to cordate-oblong, occasionally ovate-cordate, thinly strigose to subglabrous but the nerves usually rather densely pilose, 2–9 cm. long and 0·5–5·5 cm. wide; the apex long-attenuate to acuminate, obtuse or acute, mucronate, the base cordate with rounded shallow sinus and rounded basal lobes, the margin entire, ciliate or subciliate;

* Recently it was collected by Mr. B. de Winter in the Okavango, South West Africa. It would key out in the key on p. 714 near *I. eriocarpa* and *I. plzbeia*.

petioles thin, terete, pilose like the stems, 1–8 cm. long. *Inflorescences* axillary, sessile or with a very short pilose peduncle which only in exceptional cases attains a length of 1 cm., solitary or occasionally 2 in one axil, 1–3- or occasionally densely many-flowered; flowers sessile or on very short up to 3 mm. long pilose pedicels; bracteoles linear or lanceolate, pilose; lower ones 3–8 mm. long, upper ones shorter. *Sepals* linear-acuminate from an ovate base, subequal, the inner ones slightly narrower, 7–8 mm. long, pilose. *Corolla* tubular to funnelshaped, pink or mauve, darker inside, 7–9 mm. long; midpetaline areas pilose. *Ovary* with long hairs. *Capsule* ovoid-globose to globose, hairy, apiculate by the style-base, 5–8 mm. in diam. *Seeds* glabrous, minutely reticulate, 3–3.5 mm. long.

Tropical Africa (extending into the Transvaal), Madagascar, tropical Asia to N. Australia.

CAPE PROVINCE.—Ceres Div., a single record, probably locality incorrect: *Joubert* s.n. in BOL, H. no. 23269.

TRANSVAAL.—Pietersburg, Zoutpansberg, Letaba, Pilgrim's Rest, Nelspruit, Barberton.

3. ***I. plebeia*** R. Br., Prodr. Fl. Nov. Holl., ed. 1 (1810), p. 484; Ooststr. in Blumea 3 (1940), p. 492 and in Steen., Fl. Males. Ser. 1, 4.4 (1953), p. 463. ? *Convolvulus biflorus* L., Sp. Pl., ed. 2 (1763), App., p. 1668. ? *Ipomoea biflora* (L.) Pers., Synops. Pl. 1 (1805), p. 183; Hemsley in J. Linn. Soc., Bot., 26 (1890), p. 160. *Aniseia biflora* (L.) Choisy in Mém. Soc. Phys. Geneve 6 (1833), p. 483, and in DC., Prodr. 9 (1845), p. 431. *Ipomoea cynanchifolia* C. B. Clarke in Hook., Fl. Br. Ind. 4 (1883), p. 208, ex parte; emend. Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 538, non Meissn. (1869).

Type: There is no type of *Convolvulus biflorus* L. in the Linnean Herbarium or in the Stockholm herbarium. The identity with the species *I. plebeia* R. Br. is highly probable on account of the following considerations. Linné's original description agrees very well with the plants referred to *I. plebeia* or *I. cynanchifolia*, except for the phrase: "*Corollae . . . lobis apice trifidis medio minore*". However, this might refer to the midpetaline areas of the corolla-lobes. The Convolvulaceae of China were enumerated by Hemsley in J. Linn. Soc., Bot., 26 (1890) and there are only a few species of *Ipomoea* with small flowers known from that area. That the Linnean species is an *Ipomoea* is practically certain, because he described the stigma as follows: "*Stigmata duo, capitata*". The only other small-flowered *Ipomoea* from China, *I. sinensis*, has a different inflorescence and does not fit the description of *Convolvulus biflorus*. Among the unpublished notes left by Hallier in the Rijksherbarium, Leiden, is a sheet of *Ipomoea biflora* with the synonymy "*Aniseia biflora*" and "*Ipomoea cynanchifolia*" (Van Ooststroom, in litt.). Dr. Hallier had apparently arrived at the same conclusion, probably also by a process of elimination. In the absence of a recognised type specimen, the name *I. plebeia* is retained here. The type of this species is Banks & Solander s.n. (in BM) from Australia.

This species occurs in two different forms of which the typical one, *I. plebeia* subsp. *plebeia* is restricted to Asia, Indonesia and Australia and the other one, for which the name *I. plebeia* subsp. *africana* is proposed here, is widespread in Africa:

I. plebeia R. Br. subsp. ***africana*** A. Meeuse, nom. nov.—*I. geminiflora* Welw., Apontam (1859), p. 79, pro parte?; Baker & Wright in This.-Dyer, Fl. Cap. 4, 2 (1904), p. 62. *I. cynanchifolia* Baker & Rendle in This.-Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 137.

The African material differs slightly but constantly in the pubescence (which is always laxer than in Australasian material) and in the sepals (which are narrower at the base than in the typical form). The African subspecies was amply described in *Flora Capensis* 4, 2, p. 62 as "*I. geminiflora* Welw." but this name cannot be applied (see "Notes"). It was also described in *Flora of Tropical Africa* 4, 2, p. 137, as "*I. cynanchifolia*" but this name is preoccupied in *Ipomoea*. In order to avoid any difficulties connected with these names, not only a new name for the African subspecies but also a neotype is proposed (Neotype: *Codd* 7785 from Barberton, Transvaal, in PRE).

Annual. *Stems* herbaceous, prostrate or climbing, slender, laxly pilose to hispidulous, up to at least 1 m. long. *Leaves* oblong-cordate to cordate or triangular-cordate, glabrous or nearly so except on the veins mainly on the lower surface, 2–10 cm. long, and 0.5–6.5 cm. wide; the basal lobes rounded; the basal sinus broad or narrow, rounded; the margins entire, ciliate; the apex attenuate to shortly acuminate with an acute or subacute point ending in a terminal mucro; the petioles slender, striate, pilose to hispidulous like the stems, 0.5–7 cm. long. *Inflorescences* axillary, sessile or with a peduncle up to 1 cm. long; flowers usually geminate or solitary, rarely 3 together, on slender, terete, pilose or glabrous, 5–8 mm. long pedicels: bracteoles minute, lanceolate, pilose 2–2.5 mm. long. *Sepals* herbaceous to subcoriaceous, unequal, glabrous except the ciliate margins, or sometimes also hairy on the back or occasionally almost completely glabrous, obtuse to subacute, 5–7 (–8) mm. long; two outer ones ovate-acuminate or linear-acuminate from a broadly triangular, slightly cordate to truncate base, third sepal somewhat oblique, fourth and fifth sepals much narrower, oblong-lanceolate to linear. *Corolla* white, funnel-shaped, slightly longer than the calyx; the limb 5-lobed-5-angled, about 9 mm. in diam.; midpetaline areas distinct, pilose outside mainly towards the tips. *Ovary* glabrous. *Capsule* broadly ovate to globose, cuspidate by the persistent style-base, glabrous, 6–8 mm. in diam. *Seeds* shortly brownish- or greyish-pubescent, 3–4.5 mm. long.

Africa (extending into South West Africa, the Transvaal and Natal).

SOUTH WEST AFRICA.—Oshikango: *Loeb* 15 (PRE). Grootfontein, Tsumeb: *Dinter* 2926 (SAM), 7498 (BOL, PRE); Grootfontein: *Schoenfelder* S610 (PRE), prob. Grootfontein: *Schoenfelder* S852 (PRE); Namutoni: *Breyer* s.n. (PRE).

TRANSVAAL.—Pietersburg, Chuniespoort: *Codd & Dyer* 7757 (PRE); Blaauwberg: *Codd* 7967, 8728 (PRE). Zoutpansberg, Mara: *Eastwood* s.n. (PRE); Louis Trichardt: *Gerstner* 5938 (PRE); Wylies Poort: *Meeuse* 9196 (PRE). Letaba: Letaba, *Krige* 154 (PRE). Nelspruit, Alkmaar: *Rogers* 74 (GRA); Kruger National Park: *v.d. Schijff* 2417, 2502, 2728 (PRE); Kaapmuiden: *Mogg* s.n. (PRE). Barberton, Crocodile Poort: *Rogers* 23986 (NH, J); Louw's Creek: *Van Dam* s.n. (PRE); Barberton: *Liebenberg* 2364 (PRE); *Taylor* 6946 (PRE); *Codd* 7785 (PRE).

NATAL.—Amanzimtoti: *Forbes* 646 (NH). Verulam: *Schlechter* 2914 (BOL). Inanda: *Wood* 258 pro parte (NH, with *I. sinensis* subsp. *blepharosepala*); Pt. Dunford: *Gerstner* s.n. (NH).

PORTUGUESE EAST AFRICA.—40 km. from Lourenço Marques on Goba Road: *Estêves de Sousa* 66 (PRE); near Goba: *Myre & Balsinhas* 670 (LM, PRE).

SOUTHERN RHODESIA.—Bulawayo, Linyati River: *Moss* 18548 (J). Ndanga: *Wild* 2731 (SRGH). Hartley, Poole: *Wild* 1012 (SRGH). Mazoe: *Wild* 3770 (SRGH). Nuanyadzi Riv., Sabi River: *Wild* 2497 (SRGH). Umtali: *Chase* 656 (SRGH). Lomagundi, Doma: *Whellan* 283 (SRGH).

The name *Ipomoea geminiflora* Welw. was based on *Welwitsch* 6235. The sheet of this gathering in BM to be taken as the holotype appears to be a mixture of *I. plebeia* (only a scrap) and *I. verticillata* Forsk. (the two larger pieces). The same number

(6235) in other herbaria contains either the one species or the other. According to Hallier, this number in the herb. De Candolle and Berlin is, or was, *I. plebeia*; in Kew it is *I. verticillata*. I saw a duplicate in COI and this is only *I. verticillata*. Welwitsch's own description is non-committal and cannot be used to decide which form is meant. However, both species have older names [*I. plebeia* (1810), and *I. verticillata* Forsk. (1775), respectively] and *I. geminiflora* Welw. must either be regarded as a *nomen confusum* (because the holotype is a mixture of two species) or be placed in the synonymy of *I. verticillata* Forsk.

The name *I. cynanchifolia* C. B. Clarke is based on "Wallich, Cat. no. 1399", but as Hallier pointed out, this number 1399 (in herb. Geneva) contains a mixture of three species: No. 1399/1 contains the species under discussion, but not the nos. 1399 B-D, which represent *I. eriocarpa* R. Br. No. 1399/1 again is a mixture of two species, viz. Burmese plants (= *I. cynanchifolia* C. B. Clarke sensu Hall. f.) and plants from Sikkim which Hallier referred to *I. tenuirostris* Choisy. There can be no difficulty caused by discrepancies between the herbaria having specimens of Wallich "1399" because the name *I. cynanchifolia* C. B. Clarke (1883) non Meissn. (1869) is illegitimate in any case and the other plants found under the number Wallich 1399 also have older names (*I. eriocarpa* R. Br. 1810, *I. tenuirostris* Choisy 1845).

4. *I. gracilispala* Rendle in Jl. Bot. 39 (1901), p. 12; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 58; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 31 (1956), pl. 1217b. *I. xiphosepala* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 58, non *I. xiphosepala* Baker in Kew Bull. 1894, p. 69.

Type: Zeyher 1224 in BM (photo in PRE).

Annual. Stems several from the base, prostrate, or occasionally ascending (mainly when still young), up to about 75 cm. long, subterete, more or less angular or sulcate, at first densely, later finely and shortly pubescent. Leaves often secund, erect on creeping stems, oblong or lanceolate-oblong to lanceolate, 2-6 cm. long and 0.5-2 cm. wide, usually hastate-truncate or auricled at the base, often narrowed above the basal lobes, sometimes some lanceolate with narrow base, very rarely (mainly in young plants) all lanceolate; the apex obtuse, minutely mucronate, the basal lobes entire, bifid or with 2-3 teeth; the edge entire to subrepand or sometimes with a few minute teeth, upper surface dark green, glabrescent, lower surface paler and more densely hairy; petioles 5-10 (-14) mm. long, glabrescent. Peduncles almost invariably 1-flowered, short or 0, in fruit up to 7 mm. long, thinly hairy with rather long hairs as are bracteoles, pedicels and sepals; bracteoles linear-lanceolate, 4-7 mm. long, obtuse or subacute; pedicels usually under 8 mm. long, in fruit up to 12 (-15) mm. long. Sepals erect, subequal, lanceolate to linear, acuminate, obtuse, 7-11 mm. long, 1-2 mm. wide, in fruit spreading especially at the apex and attaining 12 mm. by 4 mm. Corolla narrowly funnel-shaped, pinkish mauve with darker centre or rarely white, 12-16 mm. long, the limb spreading, somewhat 5-angled, 10-12 mm. in diam.; midpetaline areas distinct, hairy towards the tips. Capsule globose, hirsute, 6-8 mm. in diam. Seeds brown with a villous tomentum of adpressed stiff grey hairs, 4-5 mm. long.

South Africa and one record from South West Rhodesia.

CAPE PROVINCE.—Griqualand W., Vryburg: *Brueckner* 398 (KMG); *Rodin* 3506 (BOL); *Henrici* 52 (PRE); *Foley* 2770 (PRE); *Mogg* 8671 (PRE).

TRANSVAAL.—Lichtenburg: *Sutton* 402 (PRE). Potchefstroom: *Louw* 1727 (PRE). Rustenburg or Brits, Castle Gorge: *Meeuse* 9368 (PRE). Brits, nr. Wolhuterskop: *Meeuse* 9276 (PRE). Pretoria: *Smuts & Gillett* 2046, 2075, 2081, 2520 (PRE); *Meeuse* 9023, 9047, 9070 (PRE). Bronkhorstspuit: *Meeuse* 9252 (PRE). Groblersdal: *Codd*

8442. Waterberg, Warmbaths: *Bolus* 12162 (BOL); *Leendertz* H. no. 6671 (PRE); *Moss* 16585 (J); nr. Ons Hoop: *Codd* 8457; nr. Hermanusdoorns: *Meeuse* 9653. Pietersburg: *Bolus* 10905 (BOL, NH, GRA, PRE); *Codd* 7933 (PRE). Lydenburg: *Codd & Dyer* 7726, 7739 (PRE). Without exact locality, "Magaliesberg": *Burke*, isotype of "*I. xiphosepala*" Baker of Fl. Cap. (SAM).

ORANGE FREE STATE.—Vredefort, Parys: *N.N.* 557 (BOL).

The gathering of "*I. xiphosepala*" quoted by Baker, viz., a specimen leg. *Burke* from the Transvaal (in SAM) is a very good match of the type of *I. gracilisepala*. The specimen of *Burke* s.n. (SAM) I have seen has *hastate* leaves and the peduncles are not ebracteate as indicated by Baker. Of all the specimens I have seen, not one had only lanceolate leaves except very young plants; at least some of the leaves are hastate.* Mr. de Winter compared the actual types and he agrees that *I. xiphosepala* of Fl. Cap. is a synonym of *I. gracilisepala*. *I. xiphosepala* Baker (1894) is a different plant from Angola, which is identical with *I. linosepala* Hall. f. (1893).

A specimen collected by *Codd & Dyer* (no. 7739) in the Lydenburg district after a very rainy season is very luxuriant in that the flowers are present in fascicles of up to 7 flowers per axil.

This species is probably often overlooked on account of its small flowers, but it is locally very common, at any rate in the Pretoria district, and probably more generally distributed than the specimens cited above indicate.

5. *I. hackeliana* (*Schinz*) *Hall. f.* in *Engl. Bot. Jb.* 18 (1893), p. 126; Baker & Rendle in *Dyer, Fl. Trop. Afr.* 4, 2 (1905), p. 146. *Aniseia hackeliana* *Schinz* in *Verhandl. Bot. Ver. Brandenb.* 30 (1888), p. 274.

Type: *Schinz* 749 from Olukonda (Ovamboland), South West Africa, in herb. Zürich.

Annual. *Stems* several from the base, up to about 75 cm. long, prostrate, with soft patent white hairs when young, glabrescent. *Leaves* ovate-cordate, usually secund, more or less distinctly crenate or crenate-dentate, acute to rounded, sparsely pilose on both surfaces, pellucidly glandular when dry, 1-4.5 cm. long and 0.75-3.5 cm. wide; basal sinus usually wide and shallow with the blade cuneately decurrent into the petiole, petioles rather slender, pilose like the stems, 4-28 mm. long. *Flowers* solitary or in a few-flowered fascicles; peduncles 0; bracteoles practically sessile, subcordate at the base, acute, ciliate on midrib and margin, 2-4 mm. long; pedicels slender, patently hairy, up to 20 mm. long. *Sepals* green, often suffused with purplish red, about 10 mm. long, hairy, very unequal; the outer ones ovate from a cordate base, obtuse or subacute, the two inner ones lanceolate, acute; all accrescent, becoming papyraceous with distinct finely raised veins, attaining 15 mm. in length and the outer ones 11 mm. in width. *Corolla* funnel-shaped, pale pinkish mauve with darker centre or occasionally white, 12-14 mm. long; midpetaline areas slightly hairy towards the tips. *Ovary* hairy. *Capsule* subglobose, densely pilose with long white hairs, 6-8 mm. in diam. *Seeds* black, hairy, 3.5 mm. long.

SOUTH WEST AFRICA.—Ovamboland, Olukonda: *Schinz* 749 (BOL, GRA, isotypes!). Grootfontein, Tsumeb: *Dinter* 7522 (BOL, L, PRE). Okahandja: *Dinter* 951 (SAM, PRE); *Bradfield* 385 (PRE). Gibeon: *Range* 1451 (BOL, SAM).

* The leaves are narrowed at the base in the closely related *Ipomoea lyciifolia* Merxm. (in *Trans. Rhod. Sci. Assoc.* 43 (1957), p. 40) of which I have seen several gatherings from Southern Rhodesia. Its other characters are so close to *I. gracilisepala* that it cannot be more than a variety of the latter and thus becomes *I. gracilisepala* Rendle var. *lyciifolia* (Merxm.) A. Meeuse, nov. stat.

BECHUANALAND PROTECTORATE.—Mochudi: *Rogers* 6518 (BOL, GRA, J); *Harbor* in herb. *Rogers* no. 6528 (BOL); *Guive Pits*: *v.d. Merwe* 22 (BOL).

TRANSVAAL.—Zoutpansberg, Wylies Poort: *Rodin* 4228 (PRE), *Meeuse* 9194 (PRE). Waterberg, nr. Ons Hoop: *Codd* 8468 (PRE).

6. *I. oenotherae* (*Vatke*) *Hall. f.* in *Engl. Bot. Jb.* 18 (1893), p. 125; Baker & Wright in *Dyer, Fl. Cap.* 4, 2 (1904), p. 49; Baker & Rendle in *Dyer, Fl. Trop. Afr.* 4, 2 (1905), p. 145. *Convolvulus oenotherae* *Vatke* in *Linnaea* 43 (1882), p. 520. *Ipomoea petunioides* *Baker* in *Dyer, Fl. Cap.* 4, 2 (1904), p. 63. *I. cecilae* N.E.Br. in *Kew Bull.* 1906, p. 166. *I. pachypus* *Pilger* in *Engl. Bot. Jb.* 41 (1908), p. 296; *Dinter* in *Fedde, Repert.* 18 (1922), p. 431. *I. cecilae* N.E.Br. var. *quinquesecta* *Merxm.* in *Mitteil. botan. Staatssamml. München* H.6 (1953), p. 203, and var. *anomophylla* *Merxm.*, op. cit., p. 204. *I. lineariloba* *Chiov.* in *Reale Acad. d. Ital.* (1939) 4, p. 174, f. 51, e descr. et icon.

Type: *Hildebrandt* 2767 from East Africa in herb. Berlin (now destroyed). Isotypes may be extant elsewhere.

Perennial, with a fusiform rootstock up to 3 cm. thick and up to about 30 cm. long, producing annual rosulate leaves followed by several unbranched prostrate stems up to 40 cm. long in the specimens seen; the latter rather thick, angular, the younger parts with silvery-white pubescence, the older parts glabrescent. *Basal* (rosulate) *leaves*, if present, long-petioled (petiole up to 7 cm. long), the blade 4–10 cm. long either lanceolate or linear, entire, up to 1 cm. wide, or with 1–2 lateral teeth or lobes, or repando-pinnatisect, with 3–7 lobes, the terminal lobe usually distinctly longer to much longer than the lateral ones. *Cauline leaves* shorter (2–6 cm. long) and on shorter petioles (0.5–4 cm. long), entire or more often 3–7-lobed, cuneate at the base, the lobes entire or slightly repand, 2–6 mm. wide; originally, as is the petiole, laxly covered with soft silvery-white hairs, blade soon glabrescent; main nerves prominent beneath. *Flowers* solitary on very short (0.5 mm. long) peduncles; bracteoles linear-subulate or linear-filiform, 10–14 mm. long and $\frac{1}{2}$ –1 mm. wide; originally covered with the characteristic silvery-white pubescence as are pedicels and sepals; pedicels rather stout, subclavate, 5–15 mm. long. *Calyx* often rose-red in bud and in flower, 12–15 mm. long; sepals ovate or ovate-lanceolate, aristate, ciliate and with median keel of hairs, sometimes with a few teeth on the margin, outer ones herbaceous, inner ones paler and more membranous, shorter than the outer ones, all becoming broader and brown in fruit. *Corolla* narrowly funnel-shaped with spreading limb, 3–5 cm. long, described as mauve, pink or purple, those of living specimens I have seen a deep mauvish pink to light magenta; midpetaline areas glabrous. *Capsule* globose, glabrous, straw-coloured, 8–10 mm. in diam. *Seeds* 3–4 mm. long, rather thick, densely velvety pubescent with (often pinkish-grey) adpressed hairs.

Widely distributed, but apparently not very common or of local occurrence, in a more or less continuous range from South West Africa, Transvaal, Natal and Southern Rhodesia to East Africa, Abyssinia and Somaliland.

S. W. AFRICA.—Grootfontein, Otavi: *Dinter* 5259 (BOL, PRE, SAM). Aukas: *Dinter* 619 (SAM)—District unknown: *Volk* 2824 (PRE).

CAPE PROVINCE.—Mafeking: *Brueckner* 578 (KMG, PRE).

TRANSVAAL.—Lichtenburg: *Sutton* 403 (PRE: this number on two different sheets with different dates, apparently two different collections, both representing *I. oenotherae*); *Liebenberg* 21 (PRE); *Acocks* 12475 (PRE). Pretoria, near Pienaars River: *Meeuse* 9540 (PRE); Rust de Winter: *Meeuse* 9022 (L, PRE); Bapsfontein:

Meeuse 9659 (PRE). Benoni: *Bradfield* 322 (PRE). Middelburg, Wonderfontein: *Bolus* 12169 (BOL). Potgietersrust, near Grass Valley: *Meeuse* 9601 (PRE).

NATAL.—Mooi River, The Thorns (nr. Greytown): *Wood* 4490 (NH).

SOUTHERN RHODESIA.—Matobo: *West* 2485 (SRGH); Hunyani: *Eyles* 4590 (SRGH); Marandellas: *Dehn* 194 (SRGH); South Marandellas: *Myres* in herb. *Eyles* no. 7400 (SRGH); Mazoe, Umvukwes: *Wild* 3923 (SRGH).

NORTHERN Rhodesia.—Mazabuka: *Veterinary Off. C.R.S.* no. 54, 99, 407, 451, 517 (PRE).

TANGANYIKA TERRITORY.—W. slopes of Kilimanjaro: *Greenway* 6901 (PRE).

KENYA.—Nairobi: *Verdcourt* 510 (PRE).

No type or isotype was available, but Mr. de Winter has seen three S. African specimens, named *I. oenotherae* by Hallier. The variability of the species is considerable, and the original description is well within the limits of variation. East-African specimens seen by Mr. de Winter and myself are conspecific with the S. African and Rhodesian specimens, so that the indentification of the S. African and Rhodesian plants with the E. African ones (as already done in Fl. Cap.) seems to be well founded. The types of *I. petunioides* and *I. cecilae* were compared by Mr. de Winter at Kew and they are not essentially different, but fall within the range of variation. The type of *I. pachypus* Pilger (*Ellenbeck* 1209 from Somaliland) I have not seen, but Dinter (l.c.) has pointed out that in Engler's *Pflanzenwelt Afrikas* 1, 2 (1910), p. 589 this species was recorded from the Otavi-valley in S. W. Africa by Dinter, so that the S. W. African specimen had evidently been identified with the Somaliland plant in the Berlin Herbarium. At any rate, *Dinter* 619 (probably the gathering referred to by Engler) in SAM and other specimens from S. W. Africa agree with specimens from other areas, and also with Pilger's description of *I. pachypus*.

Merxmüller recently described two varieties of *I. cecilae*, but in view of the considerable variability, these varieties cannot be upheld.

I. oenotherae is closely related to *I. commatophylla* A. Rich. (which, however, is an annual without a thick swollen root and white flowers with or without a purple tube) and especially so to *I. commatophylla* var. *angustifolia* Oliv., which also lacks a swollen root and has branched, rather shrubby shoots and, according to Mr. de Winter, is worthy of specific rank. These two forms are also closely related to *I. polymorpha* R. et S. (= *I. heterophylla* R.Br. non Ortega) from the E. Indies and N.E. Australia, or even identical, according to Hallier [*Engl. Bot. Jb.* 18 (1893), p. 125] and Van Ooststroom in *Blumea* 3 (1940), p. 493.

7. *I. sinensis* (Desr.) Choisy in *Mém. Soc. Phys. Genève* 6 (1833), p. 469; and in DC., *Prodr.* 2 (1845), p. 370; Hemsley in *Jl. Linn. Soc. Bot.* 26 (1890), p. 162; Gagn. et Courch. in *Lecomte, Fl. Gén. Indo-Chine* 4 (1915), p. 236. *Convolvulus sinensis* Desr. in *Lamk., Encycl. Méth., Bot.* 3 (1789), p. 557. *C. calycinus* Roxb., *Hort. Beng.* (1814); p. 13, nomen nudum; id., *Fl. Ind. ed. Carey* 2 (1824), p. 51, descr., non alior. *C. hardwickii* Spreng., *Syst.* 4, cures post. (1827), p. 60, nomen illeg. *Aniseia calycina* (Roxb.) Choisy in *Mém. Soc. Phys. Genève* 6 (1833), p. 482 and in DC., *Prodr.* 9 (1845), p. 429. *Ipoemoea calycina* (Roxb.) Benth. ex C. B. Clarke in *Hook f., Fl. Brit. India* 4, 1 (1883), p. 201, non Meissn. (1869); Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 129. *I. hardwickii* (Spreng.) Hemsley in *Jl. Linn. Soc., Bot.* 26 (1890), p. 160; Chiov. in *Acad. Reale d'Ital.* 4 (1939), p. 174, nomen illeg. *I. auxocalyx* Pilger in *Notizbl. Bot. Gart. Berlin* 11 (1933), p. 819.

Type: A specimen leg. Moreau in herb. Jussieu (P), photograph of type in PRE.

There are two forms, only one of which is represented in Southern Africa. In agreement with Dr. B. Verdcourt who is engaged in the treatment of the Convolvulaceae for the Flora of East Tropical Africa, these two forms are referred to as follows:

I. *sinensis* (Desr.) Choisy subsp. *sinensis*.

This form includes the specimens from Asia and is also represented in East and Central Africa, but does not occur in Southern Africa.

I. *sinensis* (Desr.) Choisy subsp. *blepharosepala* (Hochst. ex A. Rich.) Verdcourt, stat. nov., in litt. *I. blepharosepala* Hochst. ex A. Rich., Tent. Fl. Abyss. 2 (1857), p. 72. *I. cardiosepala* Hochst. ex Choisy in DC., Prodr. 9 (1845), p. 393, 429, in syn., *nomen nudum*. *I. cardiosepala* Hochst. ex Baker & Wright in This.—Dyer, Fl. Cap. 4, 2 (1904), p. 61; Baker & Rendle in This.—Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 147, non *I. cardiosepala* (H.B. et K.) Meisner (1869).

Type of subspecies: *Schimper* 1780 in P.

Annual herb. Stems several from the apex of the taproot, prostrate or twining, or young shoots occasionally suberect; terete, slender, more or less densely covered with white spreading hairs, at least when young, up to about 1 m. long (rarely longer). *Leaves* thinly herbaceous, cordate, cordate-ovate or cordate-oblong, entire, obtuse or acute, mucronate, 3–8 cm. long, 2–5 cm. wide; the basal sinus usually deep and rather narrow but sometimes broad and shallow; basal lobes rounded: upper surface green, thinly pilose to quite glabrous except for a few hairs on the main nerves, lower surface usually a little more densely hairy and paler, the margin ciliate; petioles slender, 1–9 cm. long, usually much more densely pilose than the blade with patent sometimes subhirsute hairs. *Inflorescences* cymosely 1–3-flowered; peduncles slender, pilose to subhirsute, 0.5–4 (–6) cm. long; bracteoles minute, lanceolate; *pedicels* 0.5–2 cm. long, pilose, somewhat thickened towards the apex, at first erect, in fruit reflexed. *Sepals* erect, very unequal, herbaceous, glabrous to pilose or subhirsute but almost invariably ciliate with stiff white long hairs, 5–8 mm. long, accrescent in fruit; outer ones cordate or auricled at the base, long-acuminate, very acute; inner ones much narrower, lanceolate or linear, very acute. *Corolla* funnel-shaped, pale mauve with darker mauve to magenta inside the corolla-tube and the well-defined midpetaline areas somewhat darker mauve, occasionally completely white; the tube 8–12 mm. long, subcylindric; the limb spreading, faintly 5-lobed-5-angled, 15–20 mm. in diam.; midpetaline areas strigose outside at least towards the tips. *Stigma* pale mauve (also in white-flowered specimens). *Capsule* globose, glabrous, 6–9 mm. in diam., straw-coloured, apiculate by the persistent style-base. *Seeds* densely and shortly velvety hairy to almost villous with grey or fawn hairs, 4–5 mm. long. (Seeds *not* glabrous as erroneously stated in Fl. Cap.).

Throughout tropical Africa, Sudan, Abyssinia, extending into southern Africa, also in Arabia. Recorded in the Union of South Africa from the following regions and districts: South West Africa (northern part), Griqualand West, Bechuanaland, Transvaal (Marico, Rustenburg, Brits, Pretoria, Groblersdal, Lydenburg, Barberton and all districts to the north of these), Zululand, Natal (coastal districts as far south as Durban, also Weenen district). On account of its inconspicuous flowers probably often overlooked, but frequent in many places.

The nomenclature of this species is fairly complicated. The name *Convolvulus calycinus* Roxb. was the basis of two binomials, viz., *Aniseia calycina* (Roxb.) Choisy and *Ipomoea calycina* (Roxb.) Benth. ex C. B. Clarke. (N.B.: Clarke cites "Benth., Gen. Pl. II, 872" as the author of the combination, but Bentham only mentioned that in his opinion the genus *Aniseia* Choisy had to be incorporated in *Ipomoea* and he did

not mention *Aniseia calycina* specifically, so that he did not actually make the combination). The genus *Aniseia* was reinstated by Hallier, but only to include species with smooth pollen. The species under discussion has spinulose pollen and is a true *Ipomoea*. The specific epithet "*calycina*" cannot be used for this species, because it is preoccupied in *Ipomoea* on account of the earlier *I. calycina* (H.B. et K.) Meisn. in Fl. Bras. 7 (1869), p. 260, a South American species. The name *Convolvulus hardwickii* Spreng. (1827) is illegitimate because it was superfluous in the genus *Convolvulus*, being based on the same type as *C. calycinus* Roxb. and purely a new name for Roxburgh's species. It cannot be taken up as a "new" name in *Ipomoea* either because other epithets are available. The name *Ipomoea cardiosepala* Hochst. remained a *nomen nudum* till its publication with a description in Fl. Cap. (1904), but, in *Ipomoea*, the specific epithet had already been used by Meissner in Fl. Bras. 7 (1869), p. 265 for a different (South American) species.

The name *Ipomoea blepharosepala* Hochst. ex A. Rich. was based on a specimen collected in Abyssinia and was validly published. The type specimen was studied in the Paris herbarium by Dr. Verdcourt, who reported (in litt.) that the above mentioned synonymy applies. Mr. de Winter, who upon my request compared many African specimens with Indian ones, reported that there are slight and possibly constant differences in the shape of the leaves and calyx. Hallier (1893) on the other hand reduced *I. blepharosepala* to a synonym of *I. calycina* (Roxb.) C. B. Clarke. There can accordingly be very little doubt that *I. blepharosepala* and *I. sinensis* are closely related, but they are not identical, so that the former is better regarded as a distinct subspecies.

The specific epithet "*sinensis*" had already been used in *Ipomoea* by Fischer in Hort. Gorenk. ed 2 (1812), p. 28, but this name is a *nomen nudum* and does not invalidate the combination *I. sinensis* (Desr.) Choisy.

8. *I. crassipes* Hook. in Bot. Magt. 4068 (1844); Hall. f. in Bull. Herb. Boiss. 7 (1899), p. 44; Rendle in Jl. Bot. 39 (1901), p. 14; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 56; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 147. *I. calystegioides* E. Mey. ex Drège, Zwei Pflanz. geog. Doc. (1843), p. 145, 153, *nomen nudum*. *Aniseia calystegioides* (E. Mey. ex) Choisy in DC., Prodr. 9 (1845), p. 131. *Ipomoea calystegioides* [(E. Mey. ex) Choisy] Hall. f. in Engl. Bot. Jb. 18 (1893), p. 127. *I. adumbrata* Rendle and Britten in Jl. Bot. 32 (1894), p. 173; Baker and Rendle, op. cit., p. 145. *I. greenstockii* Rendle in Jl. Bot. 34 (1896), p. 38, and 39 (1901), p. 14; Baker & Wright, op. cit., p. 51. *I. sarmentacea* Rendle in Jl. Bot. 39 (1901), p. 15; Baker and Wright, op. cit., p. 57. *I. bellecomans* Rendle, in Jl. Bot. 39 (1901), p. 15; Baker and Wright, op. cit., p. 55.

Type: The actual type is the plate in Bot. Mag. t. 4068, but as Hooker mentioned that the seeds were collected by Burke, "Macalis Berg", I consider *Burke* 177 in herb. Kew (from Magaliesberg) to be equivalent to a type specimen.

Perennial. Taproot tuberous, fusiform, rather thick (up to about 10 cm. in diam.), black. Stems several to many from the base, annual, wiry, suffruticose or herbaceous, suberect or usually all ultimately prostrate, up to 75 cm. long, slender, terete, more or less densely and softly hairy to pilose or occasionally nearly glabrous, as are all other vegetative parts, peduncles, pedicels, bracts and sepals. Leaves very variable in shape and size, usually broadly lanceolate or ovate-lanceolate to ovate, sometimes linear or linear-lanceolate, and, if so, often somewhat panduriform, or oblong, broadly ovate to almost reniform, 1.5–8 cm. long and (3–) 8–28 mm. wide, rarely wider, herbaceous, entire, acute, gradually acuminate or obtuse at the apex, truncate, rounded or sometimes more or less cuneate or subcordate, rarely cordate or narrow and tapering at the base, more or less penninerved, lateral nerves in all except very narrow leaves

4-6 on either side, usually 2 of them ascending from the base, a short one and a long one, reaching the margin near the middle; all prominent beneath but considerably thinner than the prominent midrib; petioles up to about 10 mm. long, but usually shorter, very rarely up to about 3 cm. long, rather stout to very slender. *Peduncles* usually 1-flowered, less often cymosely few-flowered, longer or shorter than the leaves, usually rather slender, terete; bracteoles usually remote from the calyx, variable in size and shape but usually leafy, ovate-lanceolate or lanceolate-oblong and 0.5-1.5 times as long as the sepals, sometimes narrower or smaller; pedicels somewhat thickened, usually under 2 cm., often under 1 cm. long. *Sepals* unequal (10-) 16-22 (-28) mm. long, the outer ones in well-developed specimens ovate, more or less triangular or lanceolate, 7-11 mm. wide at the broad, often subcordate base, with distinct midrib, tapering into the subacute to acuminate apex, in some specimens narrower, lanceolate; inner ones much narrower and not subcordate at the base, often long- and rather abruptly cuspidate from on oblong basal portion. *Corolla* funnel-shaped, purple, magenta or occasionally mauve with lighter midpetaline areas, or occasionally pale mauve, pink or creamy white with darker purple centre, 30-45 mm. long and 35-60 mm. in diam.; midpetaline areas distinctly margined by raised veins, shortly hairy towards the apex. *Ovary* glabrous. *Capsule* ovoid-globose, apiculate, glabrous, 8-10 mm. in diam. *Seeds* glabrous or velvety-pubescent, about 6 mm. long.

Southern Africa from the Eastern Cape, Orange Free State, Griqualand West, South West Africa northwards and extending into Angola and tropical East Africa. Rare in S. W. Africa.

Recorded from the Eastern Cape (Bathurst, Somerset East, Albany, Queenstown, Peddie, East London, Komgha, Kentani, Elliotdale, Umtata, Lusikisiki); Basutoland; Orange Free State (Rouxville, Ficksburg, Bethlehem); Natal (from Durban to Estcourt and Northwards, including Zululand as far North as at least Nongoma); Swaziland; Transvaal (recorded from practically all districts except a few in the extreme S.W.); Griqualand West (one record from Vryburg); S. W. Africa (4 records; Ekuja, Ozondjache, Oukongo, Okahandja); Bechuanaland (one record). In addition Southern Rhodesia, Angola, northern part of Portuguese East Africa, etc.

The following specimens are of special interest: *Burke* 177 (equivalent to the type, in BOL) from Magaliesberg. *Burke* s.n. from Somerset East (PRE) and *Burke* 348 (BOL), *Gilfillan* in herb. Galpin 6157 (PRE), three numbers cited under *Ipomoea greenstockii* in Fl. Cap.; photographs (in PRE ex BM) of the types of *I. greenstockii* (*Greenstock* s.n., Pilgrim's Rest), *I. bellecomans* (*Zeyher* 1213, from Pretoria) and *I. sarmentacea* (*Greenstock* s.n., Pilgrim's Rest).

An extremely variable species of which the extremes are very different in habit, size and shape of leaves, colour of flower, pubescence, etc. Even the seeds can be quite glabrous or pubescent. The various forms are all united by intermediate specimens, so that it is not practicable to distinguish varieties as was done by Hallier and by several others. All these forms hang together by the following characters: very unequal sepals (outer ones broad and usually subcordate at the base, inner ones much narrower to subulate from a somewhat broader base), the usually conspicuous bracteoles which are generally remote from the calyx and the usually 1-flowered peduncles. So far as I have seen, the plants are either prostrate or suberect. Climbing forms have been mentioned (e.g., in Fl. Cap.), but I think this must be a mistake.

Ipomoea greenstockii is an erect form described as a different species, but many plants form first erect stems and subsequently prostrate stems. *I. bellecomans* is another erect form. *I. sarmentacea* is a form with small flowers. Mr. de Winter confirmed this synonymy after having seen the types. Occasionally the peduncles are cymosely few-flowered. *I. hewittioides*, which was recorded from Angola, is possibly such a

form, and similar specimens are also found elsewhere (Transvaal, Natal, etc.), although according to a note from Mr. Killick none of the South African material quite matches the isotype of *I. hewittioides* in BM, so that *I. hewittioides* may be distinct. *Ipomoea crassipes* can easily be distinguished from similar prostrate species plants, such as *Turbina oblongata*, *Ipomoea ommaneyi*, *I. atherstonei* and *I. pellita* but it sometimes closely resembles specimens of the tropical African species *Ipomoea asperifolia*. However, the sepals in *I. asperifolia* are not so conspicuously unequal, narrower and usually subobtusate; the calyx as a whole is much narrower at the base than that of *I. crassipes* and more oblong (usually more or less conical in *I. crassipes*). In addition, the petioles are generally longer than in *I. crassipes*, the bracteoles are minute, linear (usually conspicuous, ovate or oblong, foliaceous in *I. crassipes*), and, finally, the corolla in *I. asperifolia* is somewhat abruptly narrowed and more or less tubular at the base, whereas the corolla in *I. crassipes* is gradually narrowed and funnel-shaped. As far as I could see, *I. asperifolia* has not been recorded from South Africa (distribution: Angola, Rhodesia).

9. *I. pellita* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 130. *I. ovata* E. Mey. ex Drège, Zw. Pfl. geog. Doc. (1843), p. 154, 195, nomen tantum, and ex Rendle in Jl. Bot. 39 (1901), p. 19 descr.; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 54, inclus. var. *pellita* (Hall. f.) Baker.

Type: Drège 4905 (according to Hallier in Herb. Geneva-Deless. and Vienna).

Perennial. *Rootstock* thick, fusiform. *Stems* prostrate, several to many from the base, herbaceous but firm, robust, often somewhat angular, densely covered with patent bristly hairs, up to 2 m. long. *Leaves* ovate to oblong, entire, rather firm, obtuse, rounded or subemarginate to subacute at the apex, often mucronate; rounded, truncate or shallowly cordate at the base, 4–10 cm. long and 2–6.5 cm. wide; when young very densely covered with yellowish bristly hairs, more thinly hairy to glabrescent when old, the margin with a yellowish dense fringe of hairs; petioles hairy like the stems, always shorter, usually much shorter than the blades. *Peduncles* 3–15 cm. long, bristly, bearing the flowers in a terminal dense few-flowered head or very rarely a cyme; bracteoles linear or linear-subulate, bristly, 12–25 mm. long, or very rarely in a cymose inflorescence the lowermost more leafy, up to 35 by 5 mm.; pedicels 0 or in the cymose inflorescences up to 1 cm. long. *Sepals* subequal, very similar to the bracteoles, very bristly, 18–25 mm. long, 1–2.5 mm. wide, gradually tapering into an acute point, in fruit up to 6 mm. wide. *Corolla* funnelshaped, magenta, 4–7 cm. long and in diam., slightly hairy on the midpetaline areas. *Ovary* glabrous. *Capsule* subglobose, 12–15 mm. in diam., apiculate, glabrous. *Seeds* about 1 cm. long, dark brown glabrous.

Endemic.

Recorded from: *Eastern Cape* (Komgha, Queenstown, Willowvale, Elliottdale, Mt. Currie, Umzimkulu); *Basutoland*; *Natal* [Inanda, Camperdown, Pietermaritzburg, Richmond, Umvoti, Lions River, Estcourt, "Tugela" (prob. Weenen), Nqutu, Vryheid, Newcastle]; *Transvaal* (Wakkerstroom, Ermelo, Bethal, Witbank).

When Rendle validated *Ipomoea ovata* E. Mey. he was of the opinion that his specimens, including Drège specimens (but different gatherings), differed from *I. pellita* Hall. f. However, when Baker & Rendle united the two species, they retained the name *I. ovata* E. Mey. ex Drège, being the oldest name (although published as a nomen nudum), as was common practice in those days. Under the present rules the name *I. ovata* E. Mey. ex Rendle is invalidated by *I. pellita* Hall. f., because the latter is the oldest validly published epithet.

I. pellita closely resembles *Turbina oblongata* E. Mey. ex Choisy and, when not in fruit, can sometimes only be distinguished from the latter with difficulty. The strictly linear bracteoles and sepals of *I. pellita* are the only constant distinguishing character (in *T. oblongata* the sepals are never strictly linear and the bracteoles very rarely). As a rule *I. pellita* has denser inflorescences on long peduncles, long petioles and setose bracts and sepals, whereas *T. oblongata* usually has 1–2-flowered inflorescences on shorter peduncles, short petioles and pubescent, but not so bristly, bracts and sepals. These characters break down occasionally.

The section *Dasychaetia* as proposed by Hallier does not seem very homogeneous to me. *Ipomoea pellita* belongs rather in the section *Calycanthemum* near *I. blepharophylla*, *I. asperifolia* and *I. crassipes*, although the usually capitate and fairly dense inflorescences have apparently no counterpart in *Calycanthemum*. *I. pellita* could equally well be placed in the section *Pharbitis* subsect. *Cephalanthae* on account of the dense, capitate inflorescence but its prostrate habit does not agree with the climbing habit of this section.

I did not see the actual type, but some of the specimens referred to this species in Fl. Cap. and by Rendle, viz., Wood 806 (NH, PRE), 3460 (NH), 3974 (NH), 4999 (BOL, SAM), and the descriptions leave no doubt about the identity of this species.

In Fl. Cap. the corolla is erroneously reported to be glabrous but both Hallier and Rendle state that it is "sparse pilosis" which is quite correct.

10. *I. nil* (L.) Roth, Cat. Bot. I (1797), p. 36; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 136; House in Proc. New York Acad. Sci. 18 (1908), p. 203; Ooststr. in Blumae 3 (1940), p. 497, and in Steenis, Fl. Males, Ser. I. 4·4 (1953), p. 465. *Convolvulus nil* L., Sp. Pl. Ed. 2 (1762), p. 219. *Ipomoea hederacea* Auct. non *I. hederacea* (L.) Jacq., Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 159; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 218.

Type: The specimen of *Convolvulus nil* in the Linnean Herbarium is not the same species as the one usually considered to be *I. nil*. The original description and citations by Linné (1762) do not seem to apply to this specimen (see under no. 11 *I. purpurea*).

Herbaceous annual. Stems usually twining, retrorsely hirsute. Leaves (broadly) ovate to orbicular in outline, entire or 3-lobed; middle-lobe ovate to oblong, acuminate, lateral lobes obliquely ovate to broadly falcate, acuminate; the base broadly cordate, margin entire; both surfaces thinly to rather densely pubescent with adpressed hairs; length 4–14 cm., width 3–12 cm.; petioles retrorsely hirsute, 3–16 cm. long. Inflorescence a 1- to few-flowered umbellate cyme; peduncles thicker than the petioles of the subtending leaves, hirsute like the stems, 2–12 cm. long; bracteoles linear to filiform, 5–8 mm. long; pedicels 5–10 mm. long, retrorsely hairy. Sepals subequal, 17–28 mm., later to 35 mm. long, patently hirsute mainly in the basal portion; outer ones with lanceolate, inner ones with narrowly lanceolate base, all with a long and linear acumen. Corolla funnel-shaped, glabrous, pale to bright blue turning purple, or reddish magenta, rarely entirely white, 5–9 cm. long and 4–7 cm. in diam.; the tube and limb always paler outside. Ovary glabrous. Capsule ovoid to globose, apiculate by the style-base, glabrous, 3-celled, 8–15 mm. long and in diam. Seeds 6 or less, black when ripe, grey-puberulous, 5–8 mm. long.

Circumtropical, probably originally indigenous in Africa, often planted as an ornamental and running wild.

This species has often been confused with *I. hederacea* (L.) Jacq., an American species. Hallier [in Jb. Hamb. Wiss. Anst. 16, 3. Beih. (1899), p. 42], and later House (l.c.) have pointed out that these two species are very similar, but not identical.

The main differences are the following: *Corolla*: 2.5–3 cm. long in *I. hederacea*, (3–) 5–9 cm. long in *I. nil*. *Calyx*: Sepals dilated at the base in *I. hederacea*, not dilated in *I. nil*. *Leaves*: Lobes of leaf usually contracted below in *I. hederacea*, usually not contracted below in *I. nil*.

I. nil I have seen from South Africa only as cultivated specimens from Durban and Pretoria, but it is likely that it may occur as an escape from culture elsewhere, especially because the specimens under discussion produced a great quantity of viable seed.

As in *I. purpurea*, the ovary and capsule are normally 3-celled and 6-ovuled and 6- (or less) -seeded, respectively.

11. *I. purpurea* (L.) Roth., Bot. Abh. (1787), p. 27, and Cat. Bot. 1 (1797), p. 36; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 137; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 59 (pro parte); Ooststr. in Blumea 3 (1940), p. 496, and in Steenis, Fl. Males., Ser. 1, 4.4 (1952), p. 465. *Convolvulus purpureus* L., Spec. Pl. Ed. 2 (1762), p. 219. *Ipomoea gerrardiana* Rendle in J. Bot. 39 (1901), p. 21; Baker & Wright, op. cit., p. 54.

Type: The specimen in the Linnean Herbarium does not seem to represent the type and does not agree with the original description by Linné. It may have been acquired by Linné after 1762. Dr. Verdcourt has asked Mr. Stearn to study the nomenclature of *I. nil* and *I. purpurea*; for the time being the *status quo* is maintained.

Herbaceous annual. *Stems* twining, terete, with short hairs mixed with longer retrorse bristles. *Leaves* broadly ovate to suborbicular in outline, entire or (in South African specimens very rarely) 3-lobed; the apex acuminate, the base cordate with broadly rounded auricles; with short bristly hairs on both surfaces, 4–15 cm. by 2.5–12 cm.; petioles retrorsely hirsute, 2–15 cm. long. *Inflorescences* axillary, cymosely 1- to few-flowered; peduncles retrorsely hairy, 3–18 cm. long; bracteoles linear to filiform, up to 7 mm. long; pedicels shortly hairy or with a few bristles, 8–15 mm. long, recurved in bud, afterwards erect, in fruit up to 20 mm. long, reflexed again and thickened towards the apex. *Sepals* unequal, herbaceous, 10–15 mm., in fruit up to 20 mm. long; outer ones oblong, acute with bristly patent hairs in basal portion, glabrous towards the apex, inner ones with narrow scarious margins, linear-oblong to linear, acute, with a few bristles near the base. *Corolla* funnel-shaped, glabrous, purplish blue with reddish midpetaline areas and paler tube, reddish purple or magenta-pink to white, in some cultivated forms sometimes variegated with blue, purple or pink dots or strips, 5–6 cm. long and about 6 cm. in diam. or in depauperated specimens considerably smaller. *Capsule* globose, glabrous, 3-celled. *Seeds* glabrous or pilose at the hilum.

Originally a native of America, from New Mexico and Virginia to the Argentine and Uruguay, often cultivated in the tropics and running wild; in South Africa in several places becoming a noxious weed, recorded from most districts of the Transvaal, Northern Natal and Zululand, Orange Free State and occasionally in the Eastern Cape. Frequently cultivated ("morning glory"). Not recorded from South West Africa or Bechuanaland.

This species has often been confused with *I. congesta* R.Br. (for details see under the latter).

The flowers of *I. purpurea* vary from white, pink or pale purple to deep bluish purple; the midpetaline areas are reddish in the blue-flowered specimens and the outside, especially the tube, is frequently paler. In cultivated, but also in wild specimens in South Africa, variegated flowers are often encountered, which have various combinations of colours in spots, zones or bands.

The size of the corolla varies a great deal. This may be connected with ecological conditions. At any rate, *Ipomoea gerrardiana* Rendle, of which I have seen an isotype (Gerrard 620 in NH) is nothing but a small-flowered (depauperate?) form of *I. purpurea*. Similar plants can be found in any locality where *I. purpurea* is common, especially late in autumn.

As in *I. nil*, the ovary and capsule are normally 3-celled with 6 ovules and 6 (or less) seeds, respectively.

12. *I. congesta* R. Br., Prodr. Fl. Nov. Holl. Ed. 1 (1810), p. 485; Choisy in DC., Prodr. 9 (1845), p. 369; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 137, Wood, Natal Pl. 1 (1899), p. 75, t. 93; Ooststr. in Blumea 3 (1940), p. 500 and in Steen., Fl. Males. Ser. I, 4-4 (1953), p. 465. *I. purpurea*, Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 59, pro parte, non Roth.

Type: In herb. Banks, teste R. Brown (not seen).

Herbaceous climber, probably perennial or at least sometimes perennial. *Stems* only occasionally prostrate (and then sometimes rooting at the nodes), terete or somewhat angular, more or less densely retrorsely pilose, up to several metres long. *Leaves* cordate, broadly ovate to orbicular in outline, entire (in most wild S. African specimens) or some or all 3-lobed nearly to the middle, 4-10 (-17) cm. long and 3-10 (-16) cm. wide: the entire leaves with acuminate, mucronate apex and broadly rounded basal lobes, 3-lobed leaves with ovate or oblong, acuminate middle lobe and obliquely ovate to falcate, subacute to long-acuminate lateral lobes; margin entire, lower surface often densely, upper surface less densely hairy with soft short adpressed hairs, sometimes lower surface sericeo-tomentose; petioles retrorsely hairy, 2-7 (-18) cm. long. *Peduncles* retrorsely pilose (0.5-) 4-20 cm. long, bearing one to several flowers in a dense umbellate cyme with very short branches: bracteoles linear to filiform to occasionally foliaceous. *Sepals* unequal, mainly towards the base with rather soft adpressed hairs to nearly glabrous; outer sepals with a lanceolate or elliptic base, inner ones narrower, all gradually long linear-acuminate, 14-22 mm. long. *Corolla* funnel-shaped, 5-8 cm. long and as much in diam., glabrous, bluish purple, later more reddish purple turning red; the limb darker than the tube. *Ovary* glabrous. *Capsule* in South African specimens not seen.

Circumtropical, often cultivated and run wild, for its distribution in South Africa see notes.

This species has often been confused with *I. purpurea* (L.) Roth, but is quite distinct on account of the long-acuminate sepals with adpressed pubescence (acute, with patently hirsute pubescence at the base in *I. purpurea*).

It is not always possible to distinguish between cultivated and "wild" specimens in the herbaria. In South Africa *I. congesta* seems to grow wild in the Eastern Cape and in Natal; in other areas it occurs either cultivated or subsontaneous. Found in the coastal districts from Bathurst (Port Alfred) to Natal and Zululand, E. Transvaal (occasionally); cultivated and subsontaneous elsewhere (e.g., Johannesburg, Pretoria). The cultivated specimens are often referred to as *I. learii* Paxt. (Paxt., Mag. 6 (1839), p. 267), but they are not essentially different from luxuriant specimens of *I. congesta*.

13. *I. arachnosperma* Welw., Apont. Phyto-geogr. (1858), p. 588; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 31 (1956), pl. 1203. *Convolvulus bicolor* Desr. in Lamk., Encycl. Méthod 3 (1789), p. 564, non Vahl. (1794). *C. pilosus* Roxb., Hort. Beng. (1814), p. 14, nomen tantum, and Fl. Ind., Ed. Carey et Wall. 2 (1824), p. 55, descr., non Rottler (1803). *C. dichrous* Roem. et Schult., Syst. Veg. 4 (1819), p. 263, nomen illeg. *Ipomoea pilosa* (Roxb.) Sweet, Hort. Brit. Ed. I (1827), p. 289; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 161; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 218, non *I. pilosa* Houtt. (1777), nec Cav. (1797). *I. calophylla* Fenzl. in Flora 27 (1844), p. 312, nomen nudum. *I. dichroa* (Roem. et Schult.) Hochst. ex Choisy in DC., Prodr. 9 (1845), p. 364; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 136, nomen illeg.

Type: Welwitsch 6243 and 6244 from Loanda, Angola are apparently the syntypes (in BM); no. 6243 also in COI.

Annual. Stems several from the base, twining or occasionally prostrate, rather stout and firm, up to several metres long, covered with bulbous-based patent bristly hairs. Leaves broadly cordate-ovate in outline, up to 10 cm. long and wide, digitately 3-lobed to about the middle, green and thinly hairy above, densely silvery-white, cobwebby-tomentose beneath except on the green pilose veins; central lobe usually somewhat narrowed to the base, ovate to suborbicular, cuspidate with terminal mucro; lateral lobes oblique, rounded at the base, with a triangular subacute to acute apical portion; basal sinus acuminately reaching the insertion of the petiole; margin entire, ciliate; petioles rather stout, terete, hairy like the stems as are peduncles, pedicels, bracteoles and sepals, up to 5 cm., sometimes 7 cm. long. *Inflorescences* starting as a perfect 3-flowered dichasium, ultimately 7-11-flowered, the branches usually becoming monochasial; peduncles terete, 3-6 cm. long; secondary and tertiary cyme-branches gradually thinner, 2.5-0.5 cm. long; bracteoles in opposite pairs, ovate-lanceolate to lanceolate with a broad base, long-acuminate to aristate, 9-12 mm. long or the ultimate ones shorter; pedicels subclavate, somewhat flattened, up to 1 cm. long. *Sepals* subequal, firm, green, smooth and glabrous inside, lanceolate, long-acuminate to aristate with spreading or reflexed tips, in flower 10-13 mm. long and 2-3 mm. wide; in fruit up to 16 by 5 mm. *Corolla* funnel-shaped; pale mauve with darker mauve centre, 14-20 mm. long and as wide across, glabrous except on the midpetaline areas near the tips of the corolla-lobes. *Capsule* globose, glabrous, apiculate by the style-base, about 8 mm. in diam. *Seeds* fawn-coloured, very shortly velvety, about 4 mm. long.

Tropical Africa, India. Extends into South West Africa, Bechuanaland and the Transvaal.

Recorded from the following areas: *South West Africa* (Northern part, as far south as Otavi and Grootfontein); *Transvaal* (Waterberg, Pietersburg, Lydenburg, Zoutpansberg).

The oldest specific epithet *bicolor* cannot be used on account of *Ipomoea bicolor* Lamk. (= *I. nil*) and *I. bicolor* (Vahl) Sweet (= *Hewittia sublobata*). The names *Convolvulus pilosus* Roxb. and *C. dichrous* R. et S. are later synonyms of *C. bicolor* Desr., the first is, in addition, antedated by *Convolvulus pilosus* Rottl.; the second name is based on the same type as *C. bicolor* Desr. (Roemer and Schultes evidently renamed *C. bicolor* Desr. on account of *C. bicolor* Vahl, which latter name they retained).

The identity of *Convolvulus pilosus* Rottl. (in Ges. Naturf. Fr. Neue Schr. 4 (1803), p. 196) is not certain (it may be the same as *Ipomoea purpurea*) but even if it is the same as Roxburgh's *C. pilosus* it cannot be used for the species under discussion because the epithet "*pilosa*" is pre-occupied in *Ipomoea*: *I. pilosa* Houtt. (1777) = *Merremia*

umbellata (L.) Hall. f. and *I. pilosa* Cav. (1797) = *Ipomoea pentaphylla* (L.) Jacq. = *Merremia aegyptia* (L.) Urb.

Combinations based on the epithets "bicolor", "dichrous" and "pilosus" are in *Ipomoea*, strictly speaking, illegitimate and could only be retained as "new names" in *Ipomoea* if no other valid epithet is available. Fenzl published the name *I. calophylla* for this species in 1844 but this name is a nomen nudum.

The name *I. arachnosperma* Welw. (1858) is available for this species. It was based on specimens collected by Welwitsch in Angola. A specimen of *Welwitsch* 6243 in COI is undoubtedly the same as the plants found in southern Africa and there can be very little doubt that the synonymy indicated above is correct because Hallier and Baker and Rendle associated the *Welwitsch* number(s) 6243 (and 6244), and specimens collected by *Schimper* and *Kotschy*, with the name "*Ipomoea pilosa* Sweet", so that they were obviously convinced of the identity of the Indian plants with the African specimens.

14. ***I. wightii*** (Wall.) Choisy in Mém. Soc. Phys. Genève 6 (1833), p. 470, and in DC., Prodr. 9 (1845), p. 364; Wight, Icon. (1848), t. 1364; C. B. Clarke in Hook. f., Fl. Br. Ind. 4 (1883), p. 203; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 133, and 28 (1899), p. 32; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1905), p. 157; Brenan in Mem. New York Bot. Garden 9 (1954), p. 7. *Convolvulus wightii* Wall., Pl. Asiat. Rar. (1831), p. 55, t. 171. *Ipomoea arachnoidea* Boj., Hort. Maurit. (1837), p. 228, nomen tantum, and ex Choisy in DC., Prodr. 9 (1845), p. 364, pro. parte; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 133.

Type: From India (the plate in Wallich's Pl. Asiat. Rar. was taken to be representative).

Perennial herbaceous climber, only prostrate when no support is available. *Stems* few from the base, often firm and becoming stout, terete, retrorsely to patently pilose with yellowish or brownish hairs, up to several metres long. *Leaves* (ovate-) cordate in outline, entire to 3-lobed to about the middle, thinly herbaceous, green and more or less densely strigose above, densely (less densely in very old ones) covered with a floccose-cobwebby tomentum beneath except on the veins which are covered with adpressed yellowish hairs and thus clearly marked out, 3–12 (–20) cm. long, and 2·5–10 (–18) cm. wide; the apex acuminate, acute or obtuse, shortly cuspidate; basal sinus usually rather deep and rather narrow, basal lobes broadly rounded; margin entire to distinctly repand; apical lobe of 3-lobed leaves broadly ovate, usually somewhat constricted at the base; lateral lobes rounded, semi-orbicular to obliquely ovate-falcate; petioles rather stout, patently or retrorsely pilose, 2–10 (–15) cm. long. *Inflorescence* a dense, headlike pedunculate cyme; peduncles stoutish, hairy like stems and petioles but hairs usually pointing upwards, rarely retrorse, 3–13 cm. long; bracteoles lanceolate, acuminate, hirsute and with shorter glandular hairs on the sides and margins, 10–12 mm. long; cyme-branches very short, pedicels wanting or nearly so. *Sepals* equal, linear-lanceolate, acuminate-aristate, hirsute and with short glandular hairs on the sides and margins, 8–15 mm. long. *Corolla* funnel-shaped, described as rose-red, purple, mauve or magenta, 20–40 mm. long and the limb as much in diam., glabrous or sparsely hairy on the well-defined mid-petaline areas. *Capsule* subglobose or broadly ovoid, 8–10 mm. long and 7–9 mm. in diam.; valves almost papery, thin, usually thinly and shortly hairy mainly towards the apex. *Seeds* dark brown, glabrous, about 3 mm. long.

India, Ceylon, Madagascar, East Africa from Uganda and Zanzibar to Natal, Swaziland and Transvaal.

Recorded from the following districts: *Transvaal* (Barberton, Nelspruit, Letaba-Pietersburg, Potgietersrust, Sibasa, Zoutpansberg); *Swaziland*; *Natal* (Eshowe) and *Zululand* (N'ngoye, Umhlatuzi Valley).

I. wightii is closely related to *I. ficifolia* Lindl. and *I. arachnosperma* Welw., but was placed in a different sub-section of § *Pharbitis* by Hallier, viz., in the group *Cephalanthae*. In my opinion it should be transferred to the subsection *Chorisanthae* and inserted next to its closest allies.

Depauperate specimens of *I. wightii* sometimes closely resemble *I. arachnosperma*. Well-developed specimens are quite distinct by their dense head of flowers. The glandular bracts and sepals distinguish it in doubtful cases. The flowers of *I. ficifolia* are almost invariably larger than those of *I. wightii*, and usually fewer in number (1-5 together); with very narrow eglandular sepals.

15. *I. ficifolia* Lindl. in Bot. Reg. 26 (1840), Misc. 90, and 27 (1841), t. 13; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 135 and 28 (1899), p. 35; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 64. *Convolvulus trilobus* Thunb., Prodr. Fl. Cap. (1794), p. 35. *I. holosericea* E. Mey. ex Drège in Zw. Pfl. geog. Doc. (1843), p. 132, 195, nomen tantum; ex Choisy in DC., Prodr. 9 (1845), p. 364. *I. angulata* E. Mey. ex Drège, op. cit., p. 135, 195 nomen tantum. *I. vitifolia* E. Mey. ex Drège, op. cit., p. 158, 195, nomen tantum. *I. arachnoidea* Choisy, op. cit., p. 364, pro parte, quoad spec. Drège, non Bojer. *I. aitonii* Choisy, op. cit., p. 363, non Lindl.

Type: The plate in Bot. Reg. 27 (1841) t. 13 was taken to be representative of the species.

Perennial. Root tuberous. Stems climbing, occasionally prostrate, usually slender, herbaceous, tending to become firm or woody, up to at least 2 m. long, terete or faintly angular, often longitudinally striate, sparsely, rarely densely, pilose, hirsute or hispidulous turning scabridulous in older parts. Leaves thinly herbaceous, ovate-cordate to sub-orbicular-reniform in outline, frequently (partly) 3-lobed, more rarely all leaves undivided, 2-9 cm. long and $1\frac{1}{2}$ -8 cm. wide; the apex acute or acuminate, more rarely obtuse, mucronate; the base cordate; basal sinus usually broad and shallow; basal lobes rounded; lobed leaves divided to the middle or less deeply so, with an ovate to obovate, rhomboid-ovate or broadly ovate-triangular terminal lobe which is usually (at least in leaves divided to about the middle) distinctly constricted at the base, and obliquely ovate to somewhat falcate or rounded, semi-orbicular basal lobes which vary from shortly acuminate to broadly rounded and are shortly mucronulate: the upper surface green, more or less thinly covered with adpressed hairs; lower surface in most cases very distinctly floccosely or cobwebby-tomentose with soft white hairs when young except on the veins which are thus clearly marked out, usually less distinctly floccose to glabrescent when older but almost invariably showing vestiges of the tomentum as scattered floccose tufts of hairs often adhering to the slightly raised veins; petioles slender, usually striate, hairy like the stems, 1-5 (-7) cm. long. Inflorescences cymosely 1-5 (-many-) flowered; peduncles rather slender, pilose like stems and petioles, 2-15 cm. long; bracteoles linear-lanceolate, 7-11 mm. long, acuminate-aristate, pilose or hirsute as are the sepals; cyme-branches usually short, but occasionally up to 7 cm. long, gradually thinner upwards; pedicels short, 0-10 (-15) mm. long. Sepals equal, lanceolate, gradually acuminate into a narrow point, 10-15 mm. long. Corolla funnel-shaped, 4-6 cm. long and the limb as much in diam., pale magenta, pink or purple, glabrous or with a few pilose hairs on the well-defined mid-petaline areas; the limb shallowly 5-lobed. Capsule subglobose, 7-9 mm. in diam., glabrous in all specimens seen (according to Fl. Cap. sometimes pilose). Seeds bearing small tufts of short hairs on the back and often with very long cottony hairs attached to the edges near the top (according to Fl. Cap. sometimes glabrous), 3-4 mm. long.

Cape Province, Natal, Zululand and Portuguese East Africa (see also Notes).

Recorded from the following districts: *Cape*: Uitenhage, Alexandria, Albany, Queenstown, Bathurst, King William's Town, East London, Komgha, Kentani, Willowvale, Port St. Johns; *Natal*: Port Shepstone, Umzinto, Durban, Pietermaritzburg, Inanda, Eshowe, Weenen, Lower Umfolosi; *Portuguese E. Africa*: Inhaka (or Inyack) Island nr. Lourenço Marques.

There is very little doubt that *Convolvulus trilobus* Thunb. is the oldest name for this species, but the specific epithet *triloba* cannot be used in *Ipomoea* on account of *I. triloba* L., Sp. Pl. (1753), p. 161.

In Fl. Trop. Afr. 4, 2 (1905), p. 161, some plants are referred to a variety of *I. ficifolia* (var. *laxiflora* Hall. f.). This would extend the range of the species to Somaliland; however, the typical form seems to be restricted to South Africa and the southern part of Portuguese East Africa.

Thunberg's type is reported to have been collected in the Humansdorp district. No other specimen has since been collected farther west than Uitenhage and either the species has become extinct west of Uitenhage or Thunberg's locality was not correctly recorded.

I. ficifolia can easily be distinguished from the related species *I. wightii* and *I. arachnosperma* by its larger flowers, and from the latter also by its few-flowered inflorescences. *I. ficifolia* has also occasionally been confused in the herbaria with *I. congesta*, but the tomentose lower surface of the young leaves and the narrow, shorter, gradually acuminate and densely hirsute sepals distinguish it at once from the latter.

In Fl. Cap. the capsules of the species are said to be either glabrous with seeds having long cottony hairs, or pilose with glabrous seeds. As far as can be ascertained the capsules are always glabrous, so that the statement in Fl. Cap. may be due to confusion with the capsules and seeds of *I. wightii* which has pubescent capsules and glabrous seeds.

Lindley mentioned South America (Buenos Aires) as the possible country of origin of this species, but his plate undoubtedly represents the South African plant.

16. *I. chloroneura* Hall. f. in Engl. Bot Jb. 18 (1893), p. 132; Hiern. Cat. Welw. Afr. Pl. 1, 3 (1898), p. 734; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 52; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 153; Dinter in Fedde, Repert. 18 (1922), p. 430.

Type: Hallier mentions only *Welwitsch* 6181 from Angola in herb. Berlin and DC. (Geneva). The Berlin specimen having been destroyed, the specimen in the Geneva herbarium must be taken to represent the type.

Annual. *Main stem* erect, branched from the base, with branches erect to decumbent, often branched again, densely covered with adpressed short white hairs and spreading golden-yellow hairs when young (as are petioles and peduncles), less densely so when older, up to 25 cm., rarely up to 60 cm. long. *Leaves* herbaceous, elliptic, oblong or lanceolate to oblanceolate or elliptic-obovate, entire, obtuse to acuminate, narrowed into a cuneate base, 2–10 cm. long and $\frac{3}{4}$ –3.5 cm. wide; upper surface with adpressed white hairs, lower surface much more densely so except on the veins which are covered with golden-yellow hairs and thus clearly marked out; the margin lined with yellowish hairs; petioles 5–20 (–30) mm. long. *Inflorescence* a few-flowered pedunculate head; peduncle terete, erect or spreading 2–5 cm., in fruit up to 7 cm. long; outer bracts foliaceous, often rather large, resembling the young leaves, often 10–20 mm. long, enlarging up to 30 mm. but occasionally up to 40 mm.

in fruit, including the petiole; inner bracts smaller. *Sepals* sub-equal, elliptic-lanceolate, lanceolate or elliptic, about 6 mm. long; lower half with narrow glabrous edges, central portion densely hairy, thicker and prolonged into a densely hairy tail, accrescent in fruit. *Corolla* funnel-shaped, pale yellow to cream or almost white, a little longer to twice as long as the calyx; midpetaline areas with white hairs which project as tufts beyond the tips of the corolla-lobes. *Capsule* globose or ellipsoid, glabrous, 6–8 mm. long and 5–7 mm. in diam.; valves finely and longitudinally striate. *Seeds* with an adpressed dense silky-villous, pale fawn or drab pubescence, 3–4 mm. long.

South West Africa, Angola, Bechuanaland, extending into Transvaal and Barotseland (N. Rhodesia), also in East Africa (teste Verdcourt).

S. W. AFRICA.—Between Cunene Riv. and Eunda: *Barnard* H. no. 32319 (SAM); Auros (Otavi): *Dinter* 5778 (BOL, NH, PRE, SAM); Tsumeb: *Dinter* 7576 (BOL, PRE); Gaub: *Dinter* 2436 (SAM); Okahandja: *Bradfield* 384 (PRE); Upper Swakop nr. Okaharmi: *Dinter* 3276 (PRE, SAM).

BECHUANALAND.—Mochudi: *Harbor* in herb. Rogers 6557 (BOL) = ? 492 (KMG); N'gamiland: *Lugard and Lugard* 190 (GRA).

TRANSVAAL.—Waterberg, Naboomspruit: *Galpin* M. 235 (PRE).

ANGOLA.—*Welwitsch* 6181 (iso-type!), 6132 (COI); *Baum* 755 (COI).

N. RHODESIA.—Barotseland, Sesheke: *Borle* s.n. (PRE).

I was able to examine an isotype (*Welwitsch* 6181 in COI) and a few other specimens referred to this species by Hallier and others (*Welwitsch* 6132, *Baum* 755, *Lugard and Lugard* 190).

17. *Ipomoea ommaneyi* *Rendle* in *Jl. Bot.* 40 (1902), p. 190 (“*ommaneyi*”); *Baker and Wright* in *Dyer, Fl. Cap.* 4, 2 (1904), p. 53.

Type: *Ommaney* s.n. from Johannesburg (BM, photograph of type in PRE).

Perennial from a thick fusiform tuberous taproot which attains a length of at least 1 m. and a thickness of 25 cm. *Stems* several, annual, trailing, herbaceous, up to 2 m. long or over and in the older parts up to about 1 cm. in diam., terete, densely pubescent at least in the younger parts. *Leaves* secund, ovate-lanceolate or oblong-lanceolate, up to 30 cm. long and 12 cm. wide, rounded or subcordate at the base, subobtusely penninerved, crisped, densely ciliate and yellow-edged on the margin, densely clothed on both surfaces with silky silvery-white hairs, later somewhat glabrescent; midrib stout, very prominent beneath; lateral nerves 9–12, prominent beneath; petioles stout, 6–8 mm. in diam., terete, somewhat flattened and grooved above, densely hairy, 5–30 (–50) mm. long. *Peduncles* much shorter than the leaves, up to about 10 cm. long, densely hairy. *Flowers* several together in a dense head; outer bracts ovate or ovate-subspathulate, acuminate-cuspidate, 25–30 mm. long and about 12 mm. wide, densely silky as are the inner bracts and sepals; inner bracts shorter and narrower. *Sepals* longer than the bracts, 30–35 mm. long, the outer lanceolate, acuminate-cuspidate, the inner much narrower, linear-lanceolate. *Corolla* funnel-shaped, rose-magenta with distinct midpetaline areas which are white and densely silky outside; (30–) 40–50 mm. long; anthers sagittate. *Ovary* glabrous. *Capsule* globose, completely enclosed in the calyx, about 1 cm. in diam., with a thin, papery wall and 4 dull black, blabrous seeds.

Transvaal and some districts of Northern Cape, extends into Southern Rhodesia and Bechuanaland.

Recorded from *Griqualand West* (Barkly West, Vryburg); *Transvaal* (Marico, Wolmaransstad, Ventersdorp, Rustenburg, Krugersdorp, Pretoria, Johannesburg and Rand districts to Bethal, Heidelberg, Witbank, Middelburg, Ermelo, Carolina, Belfast, Pilgrims Rest, Pietersburg, Potgietersrust, Waterberg); *Bechuanaland* (Lobatsi); *Southern Rhodesia* (only recorded from Umtali).

Mr. de Winter compared a few specimens with the type and, in addition, I was able to study a photograph of the type (*Ommaney* s.n. in BM) and some specimens quoted in Fl. Cap., viz. *Gilfillan* in herb. Galpin 6158 (PRE, GRA) and *Wood* 7189 (NH).

I. ommaneyi is a very distinct species and resembles only *I. atherstonei* (for the difference between these two species, see under the latter). *Turbina oblongata* sometimes has several flowers in a head, but can be distinguished by the shape and pubescence of the leaves and has usually smaller bracts and sepals (they are usually 25–35 mm. long in *I. ommaneyi* and mostly under 25 mm. long in *T. oblongata*).

N.B.—A specimen *Hutton* 432, according to the label from Natal, was probably wrongly labelled and possibly collected near Johannesburg (Florida).

18. *I. atherstonei* Baker in Dyer, Fl. Cap. 4, 2 (1904), p. 53; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 154, ex descr.

Type: On account of its specific name, the specimen Atherstone s.n. from Middelburg ("Nazareth") must be taken to be the type. However, Mr. de Winter reported that the original specimens could not be traced in the Kew Herbarium, nor could they be found in the collections of the British Museum.

Prostrate perennial with fusiform tuberous root. *Stems* annual, firm, stout, often angular, up to 2 m. long, usually densely, sometimes thinly covered with short stiff hairs as are petioles, peduncles, bracts and pedicels. *Leaves* oblong to sometimes ovate-elliptic, entire, herbaceous, obtuse, emarginate or rounded and mucronate, occasionally acute, at the apex, broadly cuneate, truncate, rounded to shallowly cordate at the base, thinly covered on both surfaces with adpressed or somewhat spreading short stiff hairs, sometimes very densely so, 6–14 cm. long and 4–7.5 cm. wide; petioles 1–3 cm., occasionally up to 5 cm. long. *Inflorescence* a pedunculate, dense, few-flowered capitate cyme, occasionally reduced to a single flower; peduncles terete, rather slender to rather stout, 3–8 (–16) cm. long; bracteoles lanceolate or elliptic-lanceolate, or narrowly ovate-lanceolate, usually narrowed at the base, subacute to acuminate-aristate to the apex, 20–35 mm. long hairy; pedicels very short or 0. *Sepals* unequal; outer ones ovate-lanceolate, to oblong, inner ones narrower, all usually acute to long-acuminate; (20–) 25–35 mm. long, hairy. *Corolla* funnel-shaped, magenta (often described as "purple"), 4.5–7 cm. long, and as much in diam., midpetaline areas well-defined, silky-pilose, usually densely so. *Capsule* and *seeds* unknown.

Eastern and South Eastern Transvaal, North West Natal, Southern Rhodesia, also in Bechuanaland and S.W. Africa.

TRANSVAAL.—Belfast near Machadodorp: *Codd*, 8255, 8260 (PRE). Ermelo: Leendertz H. no. 7783 (PRE), *Walker* 99 (PRE), *Pupils of Convent* 152 (PRE), id., Spitskop: *Pott* 5001 (BOL). Lydenburg, foothills of Steenkampsberg: *Codd* 8203 (PRE). Piet Retief: *Jenkins* H. no. 11989 (PRE); *Kretschmar* s.n. (PRE); *Compton* 22338 (NBG); Iswepe: *Sidey* 1577 (PRE).

NATAL.—Utrecht: *Thode* A 335 (PRE).

SOUTH WEST AFRICA.—“latitude 23°”: *Chapman & Baines* (K).

S. RHODESIA.—Salisbury: *Eyles* 904 (SAM, SRGH).

This species is closely related to *I. ommaneyi*, but differs in several points. The bracts and sepals are less acuminate, the leaves have a different shape (more oblong and less tapering towards the apex) and have more slender petioles, and the corolla is longer than in *I. ommaneyi*. It also resembles some extreme forms of *Turbina oblongata*, but differs from the latter in that the flowers are usually much more numerous in the heads, the bracts usually wider and longer (often linear in *T. oblongata*) and the pubescence not so bristly. The leaves are usually larger than in *T. oblongata*.

No actual type being available, the identification of the specimens cited above with *I. atherstonei* is done *ex descriptione*. The specimens cited above are the only ones which fit the description and resemble *I. ommaneyi*. Moreover, the type was reported to come from near Middelburg and the specimens I refer to this species are mainly from South East Transvaal, not so far from the type locality. On the other hand, I have not seen a specimen from Middelburg, but at the time when Atherstone collected his specimens the districts were much larger than they are now, and the towns and villages fewer in number so that the localities of old collectors are often less accurate than they are at present and the type of *I. atherstonei* may well have been collected in a neighbouring area.

19. *I. magnusiana* *Schinz* in Verh. Bot. Ver. Brandenb. 30 (1888), p. 272; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 135; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 65; Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 162; N. E. Brown in Kew Bull. 1909, p. 123; Dinter in Fedde, Repert. 18 (1922), p. 431. *I. lugardi* N. E. Brown var. *parviflora* Rendle, op. cit., p. 163. *I. otjikangensis* Pilger et Dinter in Engl. Bot. Jb. 41 (1908), p. 296; Dinter in Fedde, Repert. 18 (1922), p. 431.

Two varieties can be distinguished (for a discussion see below):—

- 19a. *Ipomcea magnusiana* *Schinz*. var. *magnusiana*.

(For synonymy see above).

Type: *Schinz* 752 from South West Africa in herb. Zurich.

Perennial, forming several to many annual stems from a thin woody taproot. *Stems* twining or prostrate or young ones suberect, slender, pilose, up to about 2 m. long; *Leaves* palmately 3- or 5-lobed nearly to the base, green or yellowish-green and with rather thin adpressed pilose hairs above, densely covered with a white cobwebby tomentum beneath except on the main nerves and main veins which are covered with yellowish or brownish stiff, adpressed to patent hairs and thus clearly marked out, 2-6 (-9) cm. in diam., lobes varying from obovate to narrowly elliptic, lanceolate, oblanceolate, linear-lanceolate or ovate-lanceolate except the basal ones in 5-lobed leaves which are shorter and relatively broader; lateral lobes in 3-lobed leaves with a lateral or basal rounded lobe or auricle; apex of central and first pair of lobes subacute to acuminate, often cuspidate, of basal lobes sometimes obtuse or rounded, base of lobes narrowed and confluent; basal sinus of leaf rounded or obtuse, sinuses between the lobes acute or obtuse or sometimes rounded; margins entire or subentire, more or less distinctly ciliate; petioles a little longer to a little shorter than the leaves, usually slender, pilose. *Inflorescence* a dense, few-flowered pedunculate head, rarely by reduction flowers solitary; peduncles usually slender, pilose like stems and petioles, shorter or longer than the subtending leaf; bracts short or up to 15 mm. long, linear

or lanceolate, hairy; pedicels very short. *Sepals* somewhat unequal, lanceolate or broadly lanceolate, acute, 6–15 mm. long, hairy outside, somewhat accrescent in fruit. *Corolla* funnel-shaped, magenta-purple, mauve or pale mauve or cream with darker magenta centre, occasionally almost completely white, 12–20 mm. long and the spreading limb as much in diam.; midpetaline areas well-defined, pilose. *Ovary* glabrous. *Capsule* subglobose, 6–8 mm. in diam., glabrous. *Seeds* pubescent, 4–5 mm. long, sometimes also with long white hairs on the angles in upper half.

Recorded from *South West Africa* as far South as Okahandja; *Bechucnalana* (Mochudi); *Cape*: Mafeking, Hay; *Transvaal*: Wolmaransstad, Potchefstroom, Brits, Pretoria, Groblersdal, Waterberg, Rustenburg, Potgietersrust, Zoutpansberg, Letaba, Lydenburg, Barberton, Swaziland; *Orange Free State*: Vredefort; *Portuguese E. Africa*: between Komatipoort and Lourenço Marques; *S. Rhodesia*: Livingstone.

Ipomoea otjikangensis, of which I saw isotypes (*Dinter* 517 in GRA, PRE and SAM), is indistinguishable from *I. magnusiana* var. *magnusiana*.

19b. *I. magnusiana* Schinz var. *eenii* (Rendle) A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 31 (1956), pl. 1201. *I. eenii* Rendle in J. Bot. (London) 39 (1901), p. 21, and in Fl. Trop. Afr. 4, 2 (1905), p. 163, exclus. var. *parviflora*. *I. lugardii* N. E. Brown apud Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 163 and in Kew Bull. 1909, p. 124.

Type of variety: *Een* s.n. in herb. Brit. Mus. (from Damaraland), photograph of the type in PRE.

Stems usually climbing, up to several metres long, generally stouter than in the var. *magnusiana*. *Leaves* usually dark green above, 4–11 cm. long and 4–14 cm wide; petioles stouter than in var. *magnusiana* as a rule, 3–11 cm. long. *Peduncles* usually rather stout, 3–12 cm. long; outer bracts lanceolate, 13–15 mm. long; inner bracts usually shorter. *Sepals* ovate-lanceolate or lanceolate, 12–13 mm. in fruit to 19 mm. long. *Corolla* magenta (always?), paler outside, 20–25 mm. long and 30–40 mm. in diam. *Capsule* 7–8 mm. in diam. *Seeds* pubescent (hairs often arranged in tufts in two subparallel longitudinal lines) and usually with long white hairs on the angles in upper portion. Otherwise as var. *magnusiana*.

Almost the same distribution as that of the var. *magnusiana*, but not yet recorded from Griqualand West or Orange Free State; one record from Lusikisiki (E. Cape); in the Transvaal so far recorded from Rustenburg, Pretoria, Groblersdal, Waterberg, Lydenburg, Soutpansberg, Letaba, Nelspruit, Barberton. In addition recorded from Southern Rhodesia, Birchenough Bridge.

The distinction between *I. magnusiana* and *I. eenii* (= *I. lugardii*) is very difficult. The only character that can be used is the size of the corolla (up to 15, rarely up to 20 mm. long in *I. magnusiana* and 20–25 mm. or longer in dried specimens, in *I. eenii*). The shape of the lobes of the leaf varies and also the number of lobes (3-lobed and 5-lobed leaves often occur on one specimen). *I. lugardii* is identical with *I. eenii* because the number of lobes of the leaves is not a satisfactory distinguishing character. Mr. de Winter compared the original specimens of *I. lugardii* and the type of *I. eenii*, as well as an isotype of *Schinz* 752 and reported that the first two are identical and the last is very close. I was able to study isotypes of *Schinz* 752 (in GRA, BOL). The best solution I can see is to regard *I. eenii* (= *I. lugardii*) as a variety of *I. magnusiana*, although I am inclined to think that they are hardly worth varietal rank. Fruiting specimens cannot be distinguished with certainty, and the vegetative characters are not sufficiently distinct to separate these two varieties in every case if flowers are lacking.

20. *I. pes-tigridis* L., Sp. Pl. Ed. 1 (1753), p. 162; Choisy in DC., Prodr. 9 (1845), p. 363; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 134 and 28 (1899), p. 34; and in Bull. Herb. Boiss. 6 (1898), p. 539; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 158; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 218; Ooststr. in Blumea 3 (1940), p. 504 and in Steen., Fl. Males. Ser. I, 4·4 (1953), p. 467; Brenan in Mem. New York Bot. Garden 9 (1954), p. 7.

Type: Linnaeus based *I. pes-tigridis* on the figures in Herm. Lugdb. t. 187, Dill. Hort. Elth. t. 318, f. 11 and Rheedee, Hort. Mal. 2, t. 59. The species is also represented in the Linnaean Herbarium and the specimen may be proposed as the lecto-type.

Annual. *Stems* slender, twining or occasionally prostrate, hirsute with long spreading hairs as are petioles and peduncles, 0·5–2 m. long. *Leaves* orbicular to somewhat reniform in outline, palmately-pedately (5–) 7–9 (–11) lobed, 3–9 cm. long and 4–12 cm. wide; broadly cordate at the base; segments lanceolate-elliptic to elliptic, ovate-lanceolate or oblong, attenuate to acuminate and acute or subacute, minutely mucronate at the apex, narrowed and confluent at the base, lateral ones vary gradually smaller, lowermost somewhat oblique to falcate, often obtuse, all rather thinly pilose on both surfaces with adpressed to patent hairs; sinuses between the lobes rounded; petioles rather slender, 1·5–10 cm. long. *Inflorescence* a pedunculate, involucrate, few-flowered head; peduncle 2–12 (–18) cm. long; outer bracts foliaceous, linear-oblong to oblong, 1·5–3 cm. long, often broad, subcordate to subauriculate at the base, densely hirsute-pilose, inner bracts smaller. *Sepals* lanceolate or the inner ones somewhat narrower, pilose-hirsute like the bracts, 7–12 mm. long. *Corolla* funnel-shaped, mauve or pale purple, 3–4 (–5·5) cm. and the limb as much in diam., sparsely pilose with stiff, adpressed hairs on the midpetaline areas. *Ovary* glabrous. *Capsule* ovoid, glabrous, about 8 mm. long. *Seeds* brown with a white, sparse, short villous-tomentose pubescence, about 4 mm. long.

Tropical Africa, as far south as Angola and S. Rhodesia and Portuguese East Africa, one record from Transvaal; in addition Mascarenes, tropical Asia and Malaysia.

TRANSVAAL, Nelspruit, between lower Sabie and Skukuza: *v.d. Schijff* 1775 (PRE); also collected recently by B. de Winter in the Okavango, South West Africa.

Hallier distinguished several varieties and subvarieties; some of them have been upheld in Fl. Trop. Afr. Anyhow, the African specimens seem to be slightly different from the Asiatic ones in that the flowers are said to be "pink", mauve or "purple" (probably they are always mauve) instead of white and fewer in number in the inflorescence, and the leaves have usually more segments (7–11 against 3–7, rarely up to 9 in the Asiatic form). There seem to be sufficient grounds to distinguish the African specimens as *I. pes-tigridis* L. var. *africana* Hall. f.

21. *I. involucrata* P. Beauv., Fl. Owar. 2 (1817), p. 52, t. 89; Choisy in DC., Prodr. 9 (1845), p. 365; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 135, ex parte; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 150; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 218.

Type: Not seen (Choisy, l.c., mentions a specimen in herb. Beauv. nunc Deless., which is evidently the type specimen). The plate in Fl. Owar. is quite adequate to recognise this species.

Annual? *Stems* herbaceous, slender, twining, finely and usually retrorsely hairy to glabrescent, *Leaves* herbaceous, cordate-ovate, entire, attenuate-acuminate, subacute, obtuse and mucronate at the apex, thinly hairy on both surfaces with adpressed hairs, sometimes more densely so beneath, with an obtuse or rounded basal sinus and broadly rounded basal lobes, 2–8 cm. long and 1·5–7 cm. wide; petioles slender, retrorsely

pilose like the stem and peduncles, 1.5–10 cm. long. *Inflorescence* a pedunculate involucrate head; peduncle usually slender, terete 2–12 cm. long; outer bracts connate into one large, hairy boat-shaped structure 3–6 cm. in diam. with 2 cusps; inner bracts smaller, bluntly obovate or oblanceolate to linear-oblong. *Sepals*: outer ones lanceolate, acuminate, about 12 mm. long, inner ones shorter and ovate, glabrescent or sparsely hairy on the back and setose along the margin. *Corolla* funnel-shaped, its colour described as purple, mauve or bright rose-red, 3–5 cm. long and as much in diam., midpetaline areas well-defined, minutely pilose. *Capsule* small, globose, glabrous. *Seeds* shortly pubescent or glabrous.

Throughout tropical Africa, extending into Angola, Southern Rhodesia, Portuguese East Africa and the Northern Transvaal.

TRANSVAAL.—Soutpansberg: Entabeni Forest Station near Louis Trichardt: *Galpin* 9463 (PRE).

Hallier united *I. involucreta* and *I. pileata* Roxb. but these species are quite distinct. They can easily be distinguished by the characters mentioned in the key, even if corollas are wanting, but vegetative specimens are indistinguishable.

Ipomoea operosa C. H. Wright (in Kew Bull. 1897, p. 275) = *I. involucreta* var. *operosa* (C. H. Wright) Hall. f. in Engl. Bot. Jb. 30 (1901), p. 387, does not seem to be more than a hairy form of *I. involucreta*. I have not seen any authentic specimens of *I. operosa*, but at any rate the *Galpin* specimen is typical *I. involucreta*.

22. *I. pileata* Roxb., Fl. Ind. ed. Carey et Wall. 2 (1824), p. 94, and id., ed. Carey, I (1832), p. 504; Choisy in DC., Prodr. 9 (1845), p. 365; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 53; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 151; Ooststr. in Blumea 3 (1940) p. 507 and in Steenis, Fl. Males., Ser. I, 4.4 (1953), p. 467. *I. involucreta* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 135, ex parte, exclus. type.

Type: Not seen.

Usually described as an annual, but a specimen in PRE (*Levy* 33 from Wankie, S. Rhodesia) shows a fusiform thick taproot and seems to indicate a perennial habit. *Vegetative characters* as *I. involucreta* (see no. 21). *Inflorescence* a pedunculate, involucrate head, peduncle retrorsely pilose, 2–5 cm. long; outer bracts connate into a large, boat-shaped structure 2.5–4 cm. long with two cusps; inner bracts much smaller, oblong or elliptic, obtuse. *Sepals* herbaceous, 3 outer ones oblong-spathulate to oblong, obtuse, about 10 mm. long, inner ones much narrower, lanceolate with a long and slender point, 9 mm. long, all hairy outside and inside. *Corolla* pink with darker centre or purple, hypocrateriform; tube about 2 cm. long, rather slender, glabrous except near the top; limb spreading, 1.5–3 cm. in diam., midpetaline areas sparsely pilose, mucronate. *Ovary* glabrous. *Capsule* globose, small. *Seeds* glabrous or thinly pubescent.

East Tropical Africa, extending into Southern Rhodesia, Portuguese East Africa and Transvaal. Also in the Mascarene Islands, India to China and Malaysia.

TRANSVAAL.—Barberton: *Galpin* 882 (PRE, BOL); *Thorncroft* 800 (NH).

See also under *I. involucreta*. The African specimens agree in every respect with the Asiatic ones.

23. *I. batatas* (L.) Lam., Tabl. Encycl. I (1791), p. 465; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 138; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 175; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 216; Ooststr. in Blumea 3 (1940), p. 512, and in Steenis, Fl. Males., Ser. I, 4·4 (1953), p. 469. *Convolvulus batatas* L., Sp. Pl. Ed. 1 (1753), p. 154. *Batatas edulis* (Thunb.) Choisy in DC., Prodr. 9 (1845), p. 338.

Type: Linnaeus originally based his species on pre-Linnaean descriptions and plates. This species is also represented in the Linnean Herbarium and the specimen (or one of the specimens) may be proposed as the lecto-type.

Perennial with ellipsoid to fusiform, yellow or reddish tubers. *Stems* herbaceous, containing a milky juice, prostrate or ascending, occasionally twining, up to 5 m. long, much branched, terete or angular, rooting at the nodes, glabrous or hairy. *Leaves* broadly ovate to orbicular in outline, acute to obtuse, mucronulate, broadly cordate to truncate at the base, 4–14 cm. long and 4–11 cm. wide, entire or more or less deeply palmately 3–5 (–7)-lobed; the lobes broad or narrow, broadly ovate to linear-oblong, both surfaces glabrous or thinly hairy; nerves green or purple; petioles glabrous or hairy, 4–20 cm. long. *Inflorescences* cymosely 1- to several-flowered; peduncles stout, angular, glabrous or hairy, 3–18 cm. long; bracteoles minute, narrow, acute, 2–3 mm. long, early deciduous; pedicels 3–12 mm. long. *Sepals* subcoriaceous; outer ones oblong or elliptic-oblong; inner ones elliptic-oblong to ovate-oblong, all glabrous or pilose on the back and fimbriate, acute or subacute and ending in a mucro, subequal in length or inner ones longer, 7–8 mm. long or sometimes the inner ones 9–12 mm. long. *Corolla* pale mauve, campanulate-funnelshaped, glabrous, 3–4·5 cm. long. *Ovary* hairy or occasionally glabrous. *Capsules* rare or absent in cultivated specimens, ovoid, 4- or less-celled. *Seeds* glabrous.

Probably originally a native of America, but now widely cultivated in the tropics, occasionally found run wild as a culture-relic.

A few specimens in the herbaria which were not reported to be cultivated ones may indicate that in Southern Africa also specimens are occasionally found as culture-relics and that is why this species is included here.

24. *I. obscura* (L.) Ker-Gawl., Bot. Reg. 3 (1817), t. 239; Choisy in DC., Prodr. 9 (1845), p. 370; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 140, and 28 (1899), p. 38; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 62 ex parte; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 164; Ooststr. in Blumea 3 (1940), p. 519, and in Steenis, Fl. Males. Ser. I, 4·4 (1953), p. 471. *Convolvulus obscurus* L., Sp. Pl. Ed. 2 (1762), p. 220.

Type: As there seems to be no recognised type in the Linnean Herbarium, the plate and description in Dill., Hort. Elth., p. 98, t. 83, f. 95 were taken as the type. The plate and description are sufficient for recognition and post-Linnaean authors all seem to agree on its identity.

Perennial. *Taproot* not thicker than a finger, 50 cm. long and over, with yellowish bark. *Stems* several to many from the apex of the root, prostrate or twining, 1–2 m. long and over, slender, terete, glabrous or patently hairy, sometimes almost lanate, green and herbaceous when young, older portions with a longitudinally grooved and transversely split bark and tending to become woody. *Leaves* often secund on prostrate stems, herbaceous, ovate-cordate to oblong-cordate, cordate-sagittate to broadly cordate or occasionally cordate-reniform, acute to obtuse and mucronate, with broadly rounded basal lobes and a narrow or wide sinus, entire or slightly undulate and often ciliate along the margin, paler beneath, thinly pubescent on both sides or glabrous, sometimes densely hairy, 2–5 (–10) cm. long and 2–4·5 (–9) cm. wide: petioles erect

on creeping stems, slender, glabrous or hairy like the stems, 1.5–4 (–9) cm. long. *In-florescences* 1-flowered to cymosely few-flowered; peduncles slender, 1–14 cm., but usually 3–8 cm. long, glabrous or shortly hairy; bracteoles minute, narrow, acute; pedicels usually 1–2 cm., minutely verrucose, shortly hairy or glabrous, at first erect but in fruit reflexed and thickened towards the apex. *Sepals* subequal or the outer ones a little shorter, subcoriaceous, much imbricate, subacute, mucronulate 3–4 mm. long, shortly pubescent or occasionally glabrous: outer ones ovate with narrow, white margins, the middle portion thicker, inner ones broadly ovate, thinner; in fruit all somewhat accrescent, turning brown and ultimately often spreading or reflexed. *Corolla* funnel-shaped, pale yellow to white with purple centre in the var. *obscura*, pale yellow and concolorous in the var. *fragilis*, glabrous or the midpetaline areas thinly hairy towards the apices and the adjoining parts of the limb finely ciliate, usually 2–3 cm. long and the limb as much in diam., but not infrequently smaller, only 12–20 mm. long; the limb spreading, shallowly 5-lobed-5-angled: midpetaline areas conspicuous. *Ovary* glabrous. *Capsule* broadly ovoid, apiculate, straw-coloured, 7–9 mm. long and 6–8 mm. in diam. *Seeds* brown but appearing greyish or drab from the very dense, short, adpressed velvety, and shiny tomentum, 4–5.5 mm. long.

Two varieties can be distinguished:

24a. ***I. obscura* var. *obscura***. Flowers white or pale yellow with a dark purple centre.

This is a rare form in South Africa and only recorded from the coast of Natal and south east Transvaal. Its distribution seems to be mainly East African; also in the Mascarenes, tropical Asia, Malaysia to northern Australia and Fiji.

TRANSVAAL.—Nelspruit, Pretoriuskop: *v.d. Schijff* 2638 (PRE). Barberton, Umvoti Creek: *Galpin* 657 (PRE).

NATAL.—Nr. Durban: *Wood* 728 (SAM), 3861 (BOL, PRE); Umhlanga: *Wood* 1424 (BOL); Melmoth Road: *Lawn* 725 (NH).

24b. ***I. obscura* var. *fragilis* (Choisy)** *A. Meeuse* in R. A. Dyer, *Flow. Pl. Afr.* 31 (1956), pl. 1222. *I. fragilis* Choisy in DC., *Prodr.* 9 (1845), p. 372; Hall. f. in *Bull. Herb. Boiss.* 7 (1899), p. 50; Baker and Rendle, *op. cit.*, p. 165; Hutch. and Dalz., *Fl. W. Trop. Afr.* 2 (1931), p. 216. *I. tenuis* E. Mey. ex Drège, *Zw. Pfl. geog. Doc.* (1843), p. 139, 144, 156, 159, nomen tantum; Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 140, nomen nudum. *I. longipes* Engl. in *Engl. Bot. Jb.* 10 (1888), p. 246, non Garcke (1849). *I. demissa* Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 129 and 28 (1899), p. 38; Baker & Rendle, *op. cit.*, p. 140. *I. obscura* Baker & Wright, *op. cit.*, pro majora parte.

Flowers pale yellow, concolorous.

Type of the variety: Choisy mentioned a Drège specimen (“*I. tenuis* E. Mey.”) and *Burchell* 2362. Mr. de Winter compared both numbers with material from South Africa.

This is the form which is very common in a large area of South Africa and also in Angola, Bechuanaland, Southern Rhodesia and West Africa, but occurs in East Africa as well; apparently not found outside the African continent.

The var. *fragilis* has been recorded from *South West Africa* (wide-spread); *Bechuanaland*; *Griqualand-West* (Vryburg, Kuruman, Hay, Barkly West, Kimberley); *Transvaal* (wide-spread, not recorded from Christiana, Bloemhof, Schweizer Reineke, Heidelberg, Witbank, Middelburg, Bethal, Standerton); *Swaziland*; *Natal* and *Zululand*; also recorded from the Hoopstad, Bloemfontein, Fort Beaufort and Komgha districts. The following specimen is of special interest:

CAPE PROVINCE.—Barkly West, Boetsap: *Marloth* 981 (isotype of *Ipomoea longipes* Engl., PRE).

I cannot distinguish the var. *fragilis* from the typical form apart from the difference in the corolla. Both forms can be twining or prostrate, glabrous or more or less densely hairy, 1-flowered or cymosely few (2–7)-flowered. The only constant distinguishing character seems to be the colour of the corolla-tube (either with a dark purple spot at the base inside, or concolorous) so that the two forms are treated as varieties here.

Ipomoea demissa Hall. f., although first referred to the section *Calycanthemum* by Hallier (and also by Baker & Rendle), was later correctly placed in the affinity of *I. obscura* and *I. fragilis* by the same author (Hallier 1899). However, apart from the smaller corolla, there is not one character to distinguish *I. demissa* from *I. fragilis*. Specimens with small flowers corresponding with *I. demissa* are not infrequently found (e.g. in South West Africa, Transvaal); they are either depauperate plants, or flowered late in the season. Sometimes the corolla is only 12 mm. long. These specimens all link up with the normal form in which the corolla is 20–30 mm. long.

25. *I. transvaalensis* A. Meeuse, nom. nov.—*I. convolvuloides* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 140; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 60, non Schinz (1888).

Type: *Zeyher* no. 1216 in herb. DC. (Geneva).

Perennial forming annual stems from a long fusiform tuberous rootstock. *Stems* prostrate and herbaceous, up to 1 m. long, or occasionally suffruticose at the base, erect and up to 30 cm. high, usually densely and rather shortly pilose as are petioles, leaves and peduncles, sometimes very densely or only sparsely so. *Leaves* herbaceous, entire, varying from broadly cordate-suborbicular to narrowly deltoid-cordate, up to about 4 cm. long rarely longer, usually distinctly cordate at the base, usually obtuse to subacute, minutely mucronate; veins usually somewhat raised and more densely hairy beneath; petioles up to 12 mm., rarely up to 20 mm. long. *Peduncles* 1–2-flowered, usually shorter than the leaves; bracts minute, lanceolate; pedicels usually under 15 mm. long; less hairy than the peduncles, thickening upwards, distinctly thickened and subclavate in fruit. *Sepals* herbaceous, subequal, ovate-lanceolate, lanceolate or ovate-oblong, inner ones with thinner pale margins, acute, minutely mucro-tipped, usually thinly and softly hairy outside, rarely quite glabrous, in fruit not or hardly accrescent but glabrescent. *Corolla* rose-coloured (deep-pink) or magenta-pink to reddish purple, funnel-shaped, 3–5 cm. long and the spreading limb as much in diam., glabrous except a few short hairs towards the tops of the midpetaline areas and dense short tufts of hairs protruding from the tips. *Capsule* subglobose or somewhat ovoid, glabrous, about 8 mm. in diam. *Seeds* densely and shortly velutinous with drab or liver-coloured hairs, about 5 mm. long.

Transvaal, but related forms, possibly of varietal status, in Southern Rhodesia and East Africa.

TRANSVAAL.—Rustenburg, Groenkloof: *Van Dam* H. no. 10982 (PRE). Waterberg, nr. Warmbaths: *Bolus* 12163 (BOL); *Smuts & Gillett* 3085 (PRE); *Codd* 2251 (PRE); *Meeuse* 9018 (PRE, L); id. nr. Nylstroom: *Van Dam* H. no. 23378 (PRE). id. *Geelhoutkop*: *Breyer* H. no. 25229 (PRE). Potgietersrust, Vlakfontein (about 18 miles due S. of Grass Valley: *Meeuse* 9611 (PRE). Brits, Silkaatsnek: *Bottomly* s.n.; *Acocks* 12426; *Codd* 737, 2616 (all PRE). Brits or Rustenburg, Castle Gorge (Kasteelpoort): *Meeuse* 9370 (PRE); *Vermeulen* s.n. (PRE). Pretoria, nr. Rust de Winter Dam: *Codd* 3494. id. nr. Premier Mine: *Menzies* 1; *Rogers* 25031 (all PRE). Bronkhorstspuit, Kameelpoort: *Meeuse* 9535 (PRE); without precise locality (but prob. Brits distr.), “Magaliesberg”: *Zeyher* 1216 (BOL, isotype!); *Burke* 166 (SAM).

This very distinct species, characterised, among other things, by the tufts of hairs at the tips of the midpetaline areas which are especially conspicuous in the late bud stage, was described as *I. convolvuloides* by Hallier, but this name is illegitimate on account of *I. convolvuloides* Schinz (= *Merremia tridentata* ssp. *angustifolia*). So far as can be ascertained, no new name has ever been suggested before, so that I propose to name it *I. transvaalensis*, the species probably being the only endemic species of *Ipomoea* occurring in the Transvaal.

The occurrence of almost suffruticose, erect forms next to prostrate ones which can also be observed in several other species (e.g., *Ipomoea crassipes*—the erect form was described as *I. greenstockii* because it was considered to be a different species) is probably to be attributed to the prevailing ecological conditions.

I. transvaalensis is often (always?) found on rocky slopes (Magaliesberg, Waterberg) in either exposed or shaded places and this may well account for the considerable variation in the habit, shape of leaves and degree of pubescence.

An isotype (Zeyher 1216) is present in BOL and, in addition, Mr. de Winter compared several specimens with an isotype at Kew. *Burke* 166, collected at the same time as Zeyher 1216 (and practically an isotype) is represented by a duplicate in SAM.

26. *I. bathycolpos* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 144; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 61.

Type: Zeyher 1218 in herb. DC. (Geneva), isotypes in BOL and SAM; the equivalent gathering *Burke* 175 in PRE and SAM.

Perennial, with a thin woody taproot producing several annual prostrate stems. *Stems* terete or angular up to about 2 m. long; scabrid with rough raised points as are petioles, peduncles, pedicels and, more thinly so, the main veins of the young leaves below. *Leaves* subcoriaceous, usually secund, more or less peltately attached to the petiole, cordate, cordate-oblong, cordate-sagittate to triangular-cordate, sometimes sagittate or cordate-reniform, acute to broadly rounded, sometimes acuminate, usually mucronate at the apex, with a deep basal sinus and incurved or spreading usually oblong basal lobes, 1.5–4.5 cm. long and 0.75–3.5 cm. wide (up to 5.5 by 4 cm. in the var. *sinuatodentata*); upper surface glabrous or nearly so (except sometimes the midrib which can be scabrous), rough, finely netted-veined, lower surface similar but with somewhat raised veins; margin thickened, cartilaginous, scabrid, subentire to sinuous or shallowly dentate or with 1 or 2 coarse teeth (with large irregular teeth all round in var. *sinuatodentata*); petioles usually shorter than or about as long as the leaves, rarely distinctly longer. *Peduncles* 1-flowered, rarely 2-flowered, equalling or somewhat exceeding the leaves; bracteoles minute, lanceolate or ovate; pedicels thickened (much more so in fruit), 0.5–2 cm. long. *Sepals* unequal, chartaceous, outer ones obtuse, about 11 mm. long, inner ones gradually longer and more acute, the innermost up to nearly 20 mm. long, much imbricate, dark green, olive green to brown or deep purplish green, scabridulous in lower half. *Corolla* funnel-shaped with very spreading limb, pale mauve to almost white with darker, mauve-magenta centre, 3.5–5 cm. long (–7 cm. in the var. *sinuatodentata*) and the limb as much in diam., glabrous or nearly so; midpetaline areas conspicuous. *Capsule* globose or depressed-globose, glabrous, about 15 mm. in diam. *Seeds* about 10 mm. long, with fawn villous tomentum.

Endemic.

26a. *I. bathycolpos* var. *bathycolpos*.

Recorded from the following districts:

CAPE PROVINCE.—Mafeking.

ORANGE FREE STATE.—Hoopstad.

TRANSVAAL.—Marico, Rustenburg, Lichtenburg, Wolmaransstad, Vereeniging, Heidelberg, Krugersdorp, Johannesburg, Germiston, Benoni, Pretoria, Middelburg, Belfast, Carolina, Ermelo, Pilgrim's Rest, Nelspruit, Barberton; one record from each: Waterberg, Potgietersrust, and Pietersburg. (A specimen in GRA leg. *Hutton* no. 434, labelled: "Howick, Natal" is most probably wrongly labelled and came presumably from Johannesburg.)

26b. *Ipomoea bathycolpos* Hall. f. var. *sinuatodentata* Hall. f. [in Bull. Herb. Boiss. 7 (1899), p. 53] is a form with larger leaves which have large irregular teeth, and a narrow basal sinus, and usually with larger flowers. The type, *Wilms* 988 in herb. Berlin was collected near Lydenburg and this form seems to be restricted to the Lydenburg district, but it is doubtful if this variety is worth maintaining.

TRANSVAAL.—Lydenburg: *Wilms* 988 (PRE, L, JE, isotypes of variety); *Marais* 69 (PRE, L).

27. *I. papilio* Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 543; Rendle in Jl. Bot. 39 (1901), p. 56; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 63; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 167. *I. papilio* Hall. f. forma *pluriflora* Merxm. in Mitteil. botan. Staatssamml. München H.6 (1953), p. 204.

Type: Not designated by Hallier, who quoted three *Rehmann* gatherings and *Galpin* 624. The specimen *Galpin* 624 in K (from Barberton, Transvaal) is proposed here as the type specimen (isotypes in PRE and Z).

Perennial. *Stems* slender, firm in texture, trailing or sometimes also climbing, puberulous when very young, glabrous, obscurely pubescent or scabridulous when older, up to 3 m. long. *Leaves* herbaceous, broadly cordate or cordate-reniform to cordate-ovate, usually abruptly acuminate into a triangular, usually entire, obtuse to very acute, mucronate apical portion, coarsely and irregularly few-toothed in the lower portion, but sometimes more gradually narrowed towards the apex and/or toothed or somewhat sinuous in upper portion, 2–6.5 cm. long and 2–7 cm. wide; basal sinus always broad and rounded but usually rather shallow; the blade glabrous or nearly so on both surfaces when old except for the minutely and obscurely ciliate margin; petioles slender, generally shorter than the blades, minutely hispidulous or scabrid like the stem. *Peduncles* 1-flowered or cymosely 2–5 (–7)-flowered, shorter or longer than the leaves, slender, hispidulous or scabrid like stems and petioles or minutely pubescent; bracts ovate, minute, usually scabrid; pedicels somewhat thickening upwards, 5–12 mm. long, minutely hispidulous, scabrid or pubescent. *Sepals* unequal, imbricate, thinly coriaceous, glabrous or minutely and thinly pubescent; outer ones oblong, elliptic or ovate to somewhat spatulate, obtuse, 5–6 mm. long, inner ones considerably longer, obtuse to almost truncate or faintly emarginate, minutely mucronate, 7–9 mm. long; in fruit hardly accrescent but somewhat spreading. *Corolla* funnel-shaped with horizontally spreading limb, light magenta or "rose-red", 2–3.5 cm. long, 3–3.5 cm. in diam., glabrous, hardly lobed; mid-petaline areas well-defined. *Capsule* globose, or broadly ovoid-conical, 6–9 mm. in diam., glabrous. *Seeds* brown, 3–4 mm. long, thinly ashy-pubescent and with a dense tuft of white or yellowish short hairs round the hilum.

Transvaal, Swaziland, Southern Rhodesia, extending into Northern Rhodesia and Portuguese East Africa. In the Transvaal recorded from Marico, Rustenburg, Pretoria, Middelburg, Belfast, Lydenburg, Barberton, Waterberg, Pietersburg, Potgietersrust, Zoutpansberg. In Southern Rhodesia wide-spread, from Bulawayo to Umtali (and extending eastward into Portuguese East Africa) and from the Transvaal border to the Zambesi (extending into Northern Rhodesia at least as far North as Mazabuka).

Merxmüller recently described a forma *pluriflora*, which is supposed to be distinct in having 2–5-flowered peduncles. The inflorescences are often 1- or few-flowered on a single specimen and this character is absolutely useless to distinguish “forms”. Hallier, in his original diagnosis of *I. papilio*, already mentioned 1–3-flowered inflorescences and it is a well-known fact that in this family many species have normally 1-flowered inflorescences, which sometimes are few-flowered, and others have normally few-flowered peduncles, which occasionally (by reduction) are 1-flowered.

28. *I. crispa* (Thunb.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 143. *Convolvulus crispus* Thunb., Fl. Cap. Ed. 2 (1818), p. 15, and Ed. Schultes (1823), p. 168. *Ipomoea contorta* Choisy in DC., Prodr. 9 (1845), p. 350; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 58. *I. undulata* Baker ex Baker & Wright, op. cit., p. 60.

Type: In herb. Thunberg, Uppsala (not seen).

Perennial, forming annual stems from the crown of a thick taproot. *Stems* slender, prostrate, covered with short bristly hairs when young, glabrescent or persistently pubescent when older, up to at least 75 cm. long. *Leaves* herbaceous, entire, ovate or oblong, rounded to acute, minutely mucronate at the apex, rounded, truncate, subcordate or broadly cuneate at the base, with usually distinctly crisped margin, 1.5–3 (–4) cm. long: thinly covered with adpressed bristly hairs, especially underneath, sometimes nearly glabrous except on the nerves below; petioles slender, 5–10 mm. long, hairy like the stems. *Peduncles* 1-flowered, shorter or longer than the leaves, usually slender, hairy like the stems or scabrous when glabrescent; bracteoles 2, small, linear or lanceolate up to about 1 cm. long; pedicels very short; peduncles and pedicels thickening in fruit; pedicels lengthening and reaching about 10 mm. *Sepals* subequal, oblong or lanceolate-oblong, acute or obtuse, 8–13 mm. long, hairy outside, in fruit enlarged, indurate, becoming 14–17 mm. long and 3–5 mm. wide, glabrescent. *Corolla* funnel-shaped, “purple” (probably magenta), 3–5 cm. long, nearly glabrous outside to silky on the midpetaline areas. *Capsule* globose, 8–9 mm. in diam., light brown, glabrous, apiculate. *Seeds* about 5 mm. long, densely greyish-velutinous.

CAPE PROVINCE.—Alexandria, Zwart Hoogte: *Burke* (PRE). Albany, nr. Grahams-town: *Ecklon & Zeyher* 26.1 = no. 6 (SAM); *McOwan* s.n. (GRA); *Lotsy & Goddijn* s.n. (L); *Daly* 665 (GRA, PRE); *Daly & Cherry* 880 (GRA, BOL); *Schönland* 682 (GRA); *Dyer* 1117, 1205 (GRA); 1432 (GRA, PRE); Koonap Heights: *Britten* 2025 (GRA); between Grahamstown and King William’s Town: *Smuts and Gillett* 2504 (BOL). Bedford, nr. Bedford: *Dyer* 2328 (GRA, PRE), *Comins* 741 (PRE). Stockenstrom, Fort Armstrong: *Martin* 154 (BOL, NBG). Victoria-East, Alice, Breakfast Vley: *Barker* 2805 (NBG). Peddie: 15 m. from Peddie on E. London Rd.: *Barker* 3973 (NBG). In Fl. Cap. also recorded from Fort Beaufort.

The type in the Thunberg herbarium was studied by Hallier and by N. E. Brown. In addition, Baker & Wright cite a specimen collected by Thunberg, and the above-mentioned identity is, therefore, certain [see also Juel, *Plantae Thunbergianae* (1917), p. 383].

I. crispa can easily be distinguished from related plants (such as *I. pellita*, *Turbina oblongata*) by the shorter sepals, smaller crisped leaves with recurved apical mucro, the slender 5–10 mm. long petioles and the velutinous seeds.

The midpetaline areas are not glabrous outside as stated in Fl. Cap., but usually thinly hairy. The leaves can be subcordate so that there is not one character to distinguish *I. undulata* Baker from *I. crispa*.

29. *I. lapathifolia* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 142; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 168; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 31 (1956), pl. 1209. *I. zambesiaca* Baker in Kew Bull. 1894, p. 70, non Britten. *I. hellebarda* Schweinf. ex Hall. f. var. *lapathifolia* (Hall. f.) Hall. f. in Engl. Bot. Jb. 28 (1899), p. 44.

Type: *Stuhlmann* 109 (from Quelimane, P.E.A.) in herb. Hamburg (not seen).

Perennial. Stems several from a thin taproot, twining or occasionally prostrate, at first slender, herbaceous, terete, glabrous, puberulous or sometimes hirsute, the older parts becoming somewhat woody and producing a thin wrinkled brown bark, ultimately becoming 2–3 m. long. Leaves broadly ovate to elliptic or oblong, or occasionally lanceolate, herbaceous slightly fleshy drying papery, green above, paler below, glabrous or thinly hairy, 4–10 cm. long and 2.5–7 cm. wide; the apex obtuse to subacute, rarely acute or acuminate (in lanceolate leaves), shortly mucronate; the base rounded, truncate or cuneate; the margin entire or somewhat sinuous; petioles minutely scabridulous to hirsute, 1–4 cm. long. Inflorescences cymose, pedunculate, capituliform, 3–12-flowered or occasionally (mainly the first formed on young shoots) reduced to a single flower; peduncles stouter than the petiole of the subtending leaf, terete, 1–15 cm. long; bracteoles triangular to lanceolate-subulate, erect, often keeled and concave, acute, 1–3 mm. long, early deciduous; pedicels up to 10 mm. occasionally up to 20 mm. long, terete or somewhat 4-angled, subclavate. Sepals unequal, much imbricate, subcoriaceous; outer ones green, triangular to oblong or lanceolate-oblong from a broad base, sub-acute minutely mucronate, finely muriculate or verrucose on the back, 6–7 mm. long and about 3 mm. wide; inner ones longer and with a rather broad hyaline membranous edge, oblong to ovate, smooth, 7–8 mm. long and 4–5 mm. wide; all slightly accrescent, at first closely adpressed to the fruit but later patent to reflexed, turning brown. Corolla hypocrateriform, glabrous; tube subcylindric very pale purple with fine purple striations outside, magenta inside except a white zone below the insertion of the stamens, 23–28 mm. long and about 4 mm. in diam. in upper part; the throat magenta inside; the limb pure white with yellowish green, well-defined midpetaline areas, horizontally spreading, 25–35 mm. in diam., shallowly 5-lobed-5-angled. Stamens not hairy at the base. Ovary glabrous; stigma pale mauve. Capsule globose, ultimately pale greyish brown, glabrous, apiculate, about 8 mm. in diam. Seeds usually 4, dark brown, glabrous or minutely puberulous, 4–5 mm. long.

East tropical Africa, northern part of Bechuanaland (N'gamiland), Belgian Congo.

TRANSVAAL.—Barberton, Komatipoort: *Rogers* s.n. (PRE); *Codd* 7791 (PRE). Nelspruit: *Acocks* 16633 (PRE). Pilgrims Rest or Nelspruit: *van der Schijff* 1521 (PRE).

S. RHODESIA.—Salisbury: *Wild* 1045 (SRGH); *Kerr* h. no. 45074 (SRGH, PRE). "Premier Mine": *Martineau* 255 (SRGH). "Batoka Plateau": *Allen* 441 (SRGH). Nr. Victoria Falls: *Rogers* 5007 (GRA).

BECHUANALAND.—N'gamiland: *Curson* 410 (PRE).

BELGIAN CONGO.—Ruzizi plains: *Germain* 5543 (PRE)—this record extends the range considerably.

The identification of *I. zambesiaca* Baker, based on Kirk and Scott specimens, with *I. lapathifolia*, was made by Hallier (1899). Although I have not seen the type specimen, there can be little doubt as regards the identity of the cited specimens with *I. lapathifolia*; at any rate, they were compared by Mr. de Winter with the original specimens of *I. zambesiaca* Baker, which were cited by Hallier under *I. hellebarda* var. *lapathifolia*.

Although *I. lapathifolia* is indeed closely related to *I. hellebarda*, I agree with Rendle (in Fl. Trop. Afr.) that the former should be regarded as specifically distinct from the latter. *I. lapathifolia* has leaves with cuneate base, 2–4 cm. long flowers and seeds which are glabrous or subpuberulous, sometimes with a ring of hairs around the hilum; *I. hellebarda* has leaves with sagittate, hastate or cordate base, larger flowers and velvety-pubescent seeds. At any rate, the name *I. hellebarda* was only validly published by Hallier in 1899 and cannot replace *I. lapathifolia* (1893).

There is some variation in the pubescence, the calyces and the length of the pedicels. The stems are usually glabrous, but sometimes they are thinly hispid with yellowish hairs (at least when young). The leaves are usually tapering $\frac{1}{3}$ from the base into the apex, covered with short bristly hairs on the nerves below, thinly strigose above and below between the nerves, ciliate, sometimes almost completely glabrous except the ciliate margin. The petioles are almost invariably shortly and rather densely hirsute.

The flowers usually open during the night or very early morning and on all but very overcast days close before 9 a.m.

30. *I. aquatica* Forsk., Fl. Aegypt.-Arab. (1775), p. 44; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 170; Ooststr. in Blumea 3 (1940), p. 528 and in Steenis, Fl. Males. Ser. 1, 4·4 (1953), p. 473; Brenan in Mem. New York Bot. Gardens 9 (1954), p. 7. *I. reptans* Poir. in Lamk., Encycl., Suppl. 3 (1814), p. 460, non *Convolvulus reptans* L.; Choisy in DC., Prodr. 9 (1845), p. 349; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 215. *I. sagittaeifolia* Hochreut. in Candollea 5 (1934), p. 186, non Burm. f. *I. dinteri* Schulze-Menz in Notizbl. Bot. Garten Berlin-Dahlem 15 (1941), p. 457, e descr. *I. natans* Dinter et Suesseng. in Mitteil. bot. Staatssamml. München H. 4 (1952), p. 112.

Type: Not seen. Dr. B. Verdcourt mentioned (in litt.) that the specimen in the Forskåhl herbarium does not agree with the description, but an isotype in BM does. The specimen in C must have been wrongly labelled.

Herbaceous perennial (but sometimes annual in unfavourable habitats). *Stems* several to numerous from a stout woody base, thick, terete or striate, hollow or spongy, rooting at the nodes, trailing on moist soil or mud or floating on water, up to 2–3 m. long, entirely glabrous or hairy at the nodes; no subterranean tubers (the species is easily propagated by cuttings). *Leaves* very variable in shape and size: ovate, triangular, ovate-oblong, lanceolate or linear, acut or obtuse to retuse and mucronulate at the apex, truncate or rounded at the base in the narrower leaves, but more often cordate to sagittate or hastate, with rounded or with acutish to acute, entire or dentate auricles, 3–15 cm. long and 1–9 cm. wide; margin above the auricles entire or coarsely dentate; petiole thick, glabrous, shorter or longer than the blade, 3–20 cm. long. *Peduncles* axillary, glabrous, thinner than the petiole, 1–12 cm. long, cymosely 1–few-flowered, pedicels longer than the calyx, glabrous, 20–65 mm. long; bracts minute, narrow, acute, 1·5–2 mm. long. *Sepals* thinly coriaceous with thin, pale margins, glabrous, sometimes verrucose, equal in length or the outer a little shorter, the latter ovate-oblong, obtuse, minutely mucronulate or blunt, 7–8 mm. long; the inner ones ovate-elliptic, obtuse, minutely mucronulate, about 8 mm. long. *Corolla* funnel-shaped, pink or mauve, often with a purple eye, rarely entirely white. 3–5 cm. long with a 4·5–5 cm. broad limb, or in depauperated specimens only 2·5 cm. long, glabrous; the tube slightly

constricted at the place of insertion of the filaments. *Ovary* glabrous; style filiform, glabrous; stigma biglobular, papillose. *Capsule* ovoid, glabrous, 8–10 mm. long. *Seeds* densely pubescent.

Circumtropical.

S. W. AFRICA.—Okavango: *Dinter* 7236 (BOL, PRE, isotypes of *I. natans* Dinter et Suesseng.); *Schoenfelder* 40 (PRE); nr. Angolan border, Kachipu and Cunene river banks; *Barnard* h. nos. 32322, 33135 (SAM).

BECHUANALAND PROT.—N'gamiland: *Curson* 407 (PRE). Tsotsorogo Pan (in N. part): *Van Son* s.n. (PRE).

Also in Angola, Southern Rhodesia and Portuguese East Africa.

Hallier [in Meded. Rijksherbarium Leiden I (1910), p. 20] has pointed out that *Convolvulus reptans* L., the type of which he was able to examine, is the same species as *Merremia caespitosa* (Roxb.) Hall. f. [= *M. hirta* (L.) Merrill]. The name *Ipomoea reptans* Poir. refers to the plant usually known as *I. aquatica* Forsk. and not to Linnaeus's species. It is, therefore, not a new combination, but a "new name" and is consequently of more recent date than *I. aquatica* Forsk.

Hochreutiner found a specimen in the herb. Burman which is, according to Van Ooststroom (1953), indeed *Ipomoea aquatica*, but the latter pointed out that this specimen cannot be the type of *Ipomoea sagittaeifolia* Burm. f., because it does not bear the name "*Ipomoea sagittaeifolia*" in Burman's handwriting (it is labelled "*Convolvulus sagittaeifolius* Burm." in Houttuyn's handwriting) and it does not resemble the plate in Burm. f., Fl. Ind. (1768), t. 18, f. 2. The actual type specimen of *I. sagittaeifolia* Burm. f. could not be traced at Geneva and Van Ooststroom could only tentatively identify Burman's plate with *Ipomoea maxima* (Linn. f.) Don ex Sweet. At any rate Burman's name cannot replace *I. aquatica* Forsk., as was erroneously concluded by Hochreutiner.

Ipomoea natans Dinter & Suesseng. is a perfectly normal specimen of *I. aquatica* Forsk. The specimen *Dinter* 7236 on which the former was based is represented in PRE and BOL by duplicates and was compared by Mr. de Winter with the African material of *I. aquatica* in the Kew herbarium. The habit of describing new species on a single specimen without sufficient checking of more material is not to be recommended, because these "new" species mostly have to be sunk later and the only gain is a number of unnecessary synonyms.

I. aquatica is often cultivated or kept in a semicultivated state in many tropical countries, because the leaves are used as a vegetable. However, the specimens found in Southern Africa appear to be perfectly wild and have not, or at least not recently, been introduced by man.

31. *I. pes-caprae* (L.), *Sweet*, Hort. Suburb. Londin. (1818), p. 35; Roth, Nov. Pl. Spec. (1821), p. 109; Choisy in DC., Prodr. 9 (1845), p. 349; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 145, and in Bull. Herb. Boiss. 5 (1897), p. 376; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 215; Ooststr. in Blumea 3 (1940), p. 532, and in Steenis, Fl. Males., Ser. 1, 4.4 (1953), p. 475. *Convolvulus pes-caprae* L., Spec. Pl. Ed. 1 (1753), p. 159. *C. brasiliensis* L., Sp. Pl. Ed. 1 (1753), p. 159. *Ipomoea biloba* Forsk., Fl. Aegypt.-Arab. (1775), p. 44; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 52; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 172; Marloth, Fl. S. Afr. 3 (1932), p. 106, t. 27, fig. B.

Type: Linnaeus based his *Convolvulus pes-caprae* originally on the plates "Herm. lugdb. 174 t. 175" and "Rheede, mal. 11, p. 117, t. 57" and his *C. brasiliensis* on "Plum. amer. 89, t. 104".

Perennial. Stems from a thick woody base, long-trailing and rooting at the nodes, stout, firm, often hollow, terete or angular, often flattened, laticiferous, 5–30 m. long. *Leaves* often secund, firm, sub-coriaceous, sub-orbicular, obovate, elliptic or transversely elliptic, emarginate or sometimes truncate, rarely rounded at the apex, mucronate, glabrous, 3–10 cm. long, 3– to 10·5 cm. wide, midrib below with 2 glands at the leaf-base; petioles glabrous, up to 12 (–17) cm. long. *Peduncles* secund, stout, angular or flattened, 1- or cymosely few-flowered, glabrous, 3–16 cm. long; primary cyme-branches 1–7 cm. long; bracts or bracteoles small, ovate-lanceolate, 3–3·5 mm. long; pedicels 12–30 mm. in fruit to 45 mm. long. *Sepals* subequal or outer ones a little shorter, subcoriaceous, glabrous, obtuse, mucronate, outer ones distinctly 3–5-nerved, ovate to elliptic, 5–8 mm. long, inner ones broader to orbicular, very concave, 7–11 mm. long. *Corolla* funnel-shaped, glabrous, pink, magenta or purple, darker inside at the base, rarely entirely white, 3–5 cm. long. *Capsule* subglobose or ovoid, 12–15 mm. long, glabrous. *Seeds* black, densely brownish tomentose-villous, 6–7 mm. long.

Circumtropical; in S. Africa from Knysna, Plettenberg Bay (Cape Province), eastwards along the coast in all suitable localities (sandy beaches) to Natal and Zululand.

This species was divided by Van Ooststroom (l.c.) into two subspecies. The South African specimens seem to belong to the *ssp. brasiliensis* (L.) Ooststr. For full synonymy, cf. Van Ooststroom (1940).

I. pes-caprae is mainly found on sandy beaches, but occasionally it occurs more inland, e.g. along the shores of Lake Nyassa.

32. ***I. simplex*** *Thunb.*, Prodr. Fl. Cap. (1794), p. 36 and in Fl. Cap. Ed. Schultes (1823), p. 170; Wood & Evans, Natal Pl. 1 (1898), p. 15, t. 15; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 48. *Convolvulus plantagineus* Choisy in DC., Prodr. 9 (1845), p. 405. *Ipomoea plantaginea* (Choisy) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 147 and in Bull. Herb. Boiss. 7 (1899), p. 53.

Type: leg. *Thunberg* from Uitenhage (in herb. *Thunberg*, Uppsala; photograph of type in PRE).

Glabrous perennial. *Rootstock* tuberous, obovoid to fusiform, usually 2–4 cm. in diam. and 4–10 cm. long. *Stem* or *stems* erect, slender, woody, usually partly underground (up to 9 cm.) and gnarled, very rough, above the ground very short or occasionally up to about 10 cm. long, angular and sulcate, rather stout to slender. *Leaves* usually approximate, linear to lanceolate, entire or with a few pinnately arranged teeth or lobes up to 15 mm. long, acuminate or acute at the apex, 3–10 cm. long and 1–6 (–12) mm. wide, long-tapering and almost sessile or sometimes rounded with a distinct petiole at the base. *Flowers* solitary, axillary, white (in only one case reported to be pale pink, perhaps they turn pinkish after wilting as in some species of *Convolvulus*); peduncles always short, bracteoles linear or linear-subulate, variable in length, those of one pair sometimes unequal in length; pedicels short. *Sepals* lanceolate or oblong-lanceolate to ovate-lanceolate, subequal or the inner ones longer, acute, 9–15 mm. long. *Corolla* funnel-shaped, 20–35 mm. long and 20–25 mm. in diam., shallowly lobed. *Capsule* globose or somewhat ovoid, glabrous, 7–9 mm. in diam. *Seeds* dark brown with a brownish, very short velutinous tomentum, 4–5 mm. long.

CAPE PROVINCE.—Uitenhage, Alexandria, Bedford, Queenstown, Albany, Bathurst, East London, King William's Town, Komgha, Kentani, Umtata.

ORANGE FREE STATE.—Ventersburg, Rouxville.

BASUTOLAND.

NATAL.—Inanda, Umvoti, Nkandhla, Zululand (one record).

TRANSVAAL.—Lichtenburg, Krugersdorp, Johannesburg and adjoining Rand districts, Pretoria, Heidelberg, Middelburg, Belfast, Ermelo and one record from Pietersburg (Haenertsburg).

For the differences between *I. simplex* and *I. bolusiana* see under the latter.

Ipomoea plantaginea (Choisy) Hall. f. was based on a specimen collected by Drège in the Zuurberg Mountains. This gathering proves to be conspecific with Thunberg's plant, but Hallier for some time mistook *I. simplex* for a different species (viz., *I. bolusiana*) until he had seen the type specimen in the Thunberg herbarium. On the type sheet of *I. simplex* is a label attached by Hallier in 1909: "*Ipomoea (Leiocalyx) simplex* Thunb. = *I. plantaginea* Hall. f. 1893".

The plant referred to *I. simplex* by Rendle in Jl. Bot. 39 (1901), p. 56 (and in Fl. Trop. Afr. 4, 2, p. 174 as *I. simplex* var. *obtusisepala* Rendle), viz., Rand 272, does not belong here. It is a slightly depauperate specimen of *I. bolusiana* (see under this species).

33. *I. welwitschii* Vatke ex Hall. f. in Engl. Bot. Jb. 18 (1893), p. 146; Hiern. Cat. Welw. Afr. Pl. I, 3 (1898), p. 739; Rendle in Jl. Bot. 39 (1901), p. 57; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 174. *I. welwitschii* Vatke ex Hall. f., var. *latifolia* Britten in Jl. Bot. 32 (1894), p. 85; Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 175. *I. hystrix* Hall. f., op. cit., p. 146, and in Bull. Herb. Boiss 7 (1899), p. 53. *I. aspericaulis* Baker in Kew Bull. 1894, p. 70. *I. inamoena* Pilger in Engl. Bot. Jb. 45 (1910), p. 221; Dinter, Neue u. wenig bek. Pfl. S.W.Afr. (1914), p. 36, fig. 54, incl. var. *trisecta* Dinter, and in Fedde, Repert. 18 (1922), p. 431. *I. semisecta* Merxm. in Trans. Rhodesia Sci. Assoc. 43 (1951), p. 41.

Type: Höpfner 39 from Okahandja, S.W.Afr. in JE, as this is the only specimen on which Vatke wrote "*Ipomoea welwitschii* Vatke".

Perennial, with subterranean tuber attaining the size of a man's head (Dinter), which has a dark bark, producing several annual stems, which are up to 50 cm., but usually under 30 cm. long (Dinter), suberect to prostrate, stiff, rather stout, 2–4 mm. thick, rarely slender, glabrous or minutely hirsute. *Internodes* mostly 1–3 cm. long. *Leaves* usually secund, linear to linear-lanceolate or ovate-lanceolate to oblong, often somewhat falcate or oblanceolate, usually tapering, acute to acuminate or apiculate at the apex, or bilobed with an apiculus in the notch, obtuse, rounded or cuneate at the base, up to 12 cm. long by 4 cm. wide, but usually 4–8 by 2–3 cm. or narrower and only 4–20 mm. wide, rigid, glabrous or with short bristles on the nerves and margins, usually conspicuously nerved with 5–8 ascending, long, rather straight nerves on either side and often with distinct reticulate nervation; petioles short, stout, 5–10 mm. long, canaliculate above, glabrous or minutely hirsute like the stem; in some specimens the leaves are more or less deeply incised (= *I. semisecta* Merxm.!) or completely trisect (–5-sect), to palmately trifid (*I. inamoena* var. *trisecta* Dinter!); the leaf-segments of deeply dissected leaves are generally under 1 cm. wide, the middle one linear or lanceolate the lateral ones linear or falcate. *Peduncles* 1-flowered or occasionally few-flowered, either very short and under 1 cm. long, or sometimes attaining 5 cm., stout, glabrous; bracts minute, lanceolate; pedicels subclavate, from

very short up to about 12 mm. long. *Calyx* glabrous; sepals subequal, ovate-oblong to ovate-lanceolate, obtuse to subacute (occasionally acute), mucronate (mucro not terminal), with narrow base which sometimes produces a subcordate appearance, (8-) 10-12 mm. long, the outer ones slightly shorter than the inner ones. *Corolla* (5-) 6-8 cm. long, pale pink or pale mauve, the tube usually darker inside, glabrous; the limb 5-angled with distinct midpetaline areas ending in mucronate-aristate points which are not always conspicuous in dried specimens. *Ovary* glabrous. *Capsule* globose (-ovoid), glabrous, apiculate, 10-12 mm. long, about 10 mm. in diam.; valves brown outside, pale straw-coloured inside, rather coriaceous. *Seeds* about 4 mm. long, glabrous with a basal tuft of hairs near the hilum.

South West Africa, Angola, Southern Rhodesia, extends into N. Rhodesia, Tanganyika, Nyasaland; one record from Bechuanaland.

ANGOLA.—Alta Catumbela, Ganda: *Faulkner* 43 (PRE). Cume: *Faulkner* 74 (PRE). S. Bié, Kamundongo: *Pocock* 834 (BOL). Between Gwelei and Luarivi: *Pocock* 770 (BOL). Between Gwelei and Kamundongo: *Pocock* 890 (BOL). Gwelei-Cumboio: *Pocock* 881 (BOL).

S. W. AFRICA.—Otavi: *Dinter* 5258 (BOL, NH, PRE, SAM). Gobabis-Oas: *Dinter* 2716 (SAM). Aitsas: *Dinter* 836 (SAM, Isotype of *I. inamoena* Pilger). Ozondjache: *Dinter* 1844 (SAM). Gaub: *Dinter* 2429 (SAM, PRE, one of the original numbers quoted by Dinter as var. *trisecta*!). Okatjimane: *Dinter* 3302 (SAM, PRE, also quoted by Dinter as var. *trisecta*!). Eahero: *Dinter* s.n. (SAM). Babi-babi: *Wilman* h. no. 1614 (KMG, also BOL).

BECHUANALAND PROT.—Molepolole: *Codd* 8922 (PRE).

S. RHODESIA.—Umvuma, Mtao: *Eyles* 7555 (SRGH) and *N.N.* herb. No. 4290 (SRGH). Hartley, Poole: *Hornby* 3120 (SRGH, PRE). Salisbury: *Eyles* 4595 (SRGH); *Wild* 611 (SRGH). Shamva: *Levisseur* herb. no. 32905 (PRE). Felixburg: *Mainwaring* in herb. *Eyles* no. 2805 (PRE, SRGH). Marandellas: *Rattray* 1378; *Corby* 548; *Dehn* 533 (all SRGH). Rusapi: *Dehn* "193a" (a regathering of the type of *I. semisecta*, SRGH). Umtali: *Chase* 1945 (SRGH). Manica: *Teague* 560 (BOL).

N. RHODESIA.—Munshiwemba: *Stöhr* 398 (BOL).

A variable species, showing in some specimens narrow leaves, in others much broader leaves or more or less completely dissected to trisect (or 5-sect) leaves. Accordingly, the species was described several times under different names. After having seen many specimens I feel confident that the above-mentioned reductions are correct although I have not seen all the actual types. The only plants collected near the type locality to which the description is applicable are those redescribed as *I. inamoena*.

The identity of *I. inamoena* Pilger was already suggested by Dinter (1922) and was put beyond doubt after I had seen an isotype (*Dinter* 836, in SAM).

I. semisecta Merxm. (of which I saw a regathering *Dehn* 193a in SRGH) agrees with several specimens with more or less dissected leaves I have seen from S. W. Africa and from Southern Rhodesia. Some specimens with partly entire, dissected leaves (such as *Dehn* "193a") link up Dinter's var. *trisecta* with the typical form and there is a considerable variation in the width of the leaves, so that I prefer to distinguish only one variable species without distinct varieties.

For the difference between *I. welwitschii* and *I. bolusiana* see under the latter. It must be emphasized that although there are several good distinguishing characters (seeds, colour of flowers) some individual specimens may be difficult to assess to the one species or the other.

34. *Ipomoea bolusiana* Schinz in Verh. Bot. Ver. Brandenb. 30 (29th Sept. 1888), p. 271; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 147 and in Bull. Herb. Boiss. 7 (1899), p. 53; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 175. *Ipomoea angustisecta* Engl. in Engl. Bot. Jb. 10 (9th Oct. 1888), p. 245, t. 7, fig. A: Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 49. *Ipomoea simplex* Hook. in Bot. Mag. 72 (1846), t. 4206; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 146, non Thunb. *I. mesenterioides* Hall. f. in Bull. Herb. Boiss. 7 (1898), p. 544; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 50. *Ipomoea praetermissa* Rendle in J. Bot. (1901), p. 56; Baker & Wright, op cit., p. 48. *I. simplex* Thunb. var. *obtusisepala* Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 174.

Type: Schinz 101 from S. W. Africa in herb. Zürich.

Perennial. *Root* tuberous, subglobose or somewhat fusiform, usually 5–10 cm. in diam. *Stems* one or several, erect or prostrate; erect ones up to about 30 cm. long, sometimes very short, prostrate ones up to at least 3 m. long, herbaceous or erect ones woody at the base, glabrous, terete, usually slender. *Leaves* either palmately 3–7 (–9) sect (mainly in creeping specimens) with very narrow, linear or filiform segments 2–7 cm. long and 0.5–3 mm. wide (sometimes somewhat pinnate to distinctly pinnate if 3 terminal segments are partly fused to form a common rachis), or simple, linear, sometimes linear spatulate and emarginate to bilobed at the apex, 4–10 (–15) cm. long and 2–4 (–7) mm. wide; petioles of dissected leaves distinct, up to about 2 cm. long, of simple leaves sometimes inconspicuous because the leaf is much narrowed at the base. *Peduncles* 1-flowered, very short, rarely longer and up to 5 cm. long; bracteoles small, lanceolate, often deciduous; pedicels short, thickened. *Sepals* ovate-lanceolate, lanceolate or oblong-lanceolate, sometimes ovate or elliptic, usually acute or acuminate, glabrous, equal or unequal in length (7–) 9–16 (–20) mm. long. *Corolla*, funnelshaped, said to be “mauve”, “bright purple” or “rosy-purple”, but probably nearly always bright magenta-pink, somewhat lighter outside and darker in the centre and on the midpetaline areas (see the plate in Bot. Mag. t. 4206), only once reported to be white, glabrous, 4–7 cm. long and 4–6 cm. in diam. *Capsule* subglobose-conical, often depressed at the apex, glabrous, apiculate by the style-base, 10–12 mm. long and in diam. *Seeds* normally 4, either (immature?) with a short dense velutinous shiny pubescence or with shiny fawn hairs longer than the 5–7 mm. long seed.

South Africa, extending into Angola, Bechuanaland and southern tropical Africa; also in Madagascar.

Recorded from: South West Africa (wide-spread in northern part); Bechuanaland; Griqualand West as far south as Kuruman and Hopetown; Orange Free State as far south as Bloemfontein; practically the whole Transvaal; Swaziland; in Natal only in a few northern districts and occasionally in Zululand. Common and frequent in many places.

A variable species. The flowers usually are considerably longer (4–7 cm. long) than those of the white-flowered *I. simplex* Thunb. (2–3.5 cm. long), which has also relatively shorter and broader, linear-lanceolate leaves which are usually entire and never palmatisect, greener, straighter and flatter than those of *I. bolusiana*. *I. bolusiana* can be distinguished from the forms of *I. welwitschii* with palmately 3-sect leaves by its usually narrower, indistinctly nerved leaf-segments (of which there are usually

5-9), its usually thinner stems and the perfectly glabrous stems and leaves (in *I. welwitschii* the vegetative parts are often more or less scabrous to subhirsute, especially the stem). The flowers of *I. welwitschii* are paler than those of *I. bolusiana* (pale pink or pale mauve).

Specimens of both *Schinz* 101 (in GRA) and *Marloth* 777 (in PRE, isotype of *I. angustisecta*) and a specimen *Rand* 272 (in GRA, isotype of *I. simplex* var. *obtusisepala*) were compared and they all represent one species. The type of *I. mesenteroides* Hall. f. (*Rehmann* 5267, from "Klippan", i.e. near Grass Valley, Potgietersrust distr., Transvaal) was kindly sent on loan by the herbarium Zürich. The specimen is poor, but a very similar plant was received from Rust-de-Winter, Transvaal, which shows the same bilobed leaf-apices and *Rehmann* 5267 is, to my mind, referable to *I. bolusiana*. *I. praetermissa* Rendle is represented in PRE by a photograph of the type and appears to be the form of *I. bolusiana* with undivided, lanceolate leaves. The type of *I. praetermissa* (*Zeyher* 1214) was said to be without locality, but it is very likely that it was collected in the Transvaal.

Hallier was of the opinion that "*I. simplex*" of Bot. Mag. (non Thunb.) was different from *I. bolusiana* (= *I. angustisecta*), probably because the leaves of the first are undivided and of the latter dissected. However, these two extremes are linked up by many specimens with divided and dissected leaves on one specimen. Hallier, when he had seen Thunberg's type of *I. simplex*, rectified his original mistake (see under *I. simplex*), but he apparently never published his findings.

35. *Ipomoea tricolor* Cav., Icon. 3 (1794), p. 5, t. 208; Choisy in DC., Prodr. 9 (1845), p. 359; Van Ooststr. in Van Steenis, Fl. Males. Ser. 1, 4.4 (1953), p. 478. *I. violacea* L., Sp. Pl. Ed. I. (1753), p. 161; House in Ann., N.Y. Acad. Sci. 18 (1908), p. 259; Van Ooststr. in Blumea 3 (1940), p. 541. *I. rubro-caerulea* Hook. in Bot. Mag. (1834), t. 3297; Choisy, op. cit., p. 375.

Type: The plate in Cav., Icon., was taken to be representative.

Herbaceous, glabrous twiner with perennial rootstock. *Stems* in S. Africa annual, terete, up to 3 m. long, hollow. *Leaves* ovate, cordate at the base, long acuminate, somewhat succulent drying thin and papery, 3.5-7 cm. long and 2.5-6 cm. wide; petioles thin, 1.5-6 cm. long. *Peduncles* cymosely few-flowered, terete; fistulose, as thick as the stems, 3-9 cm. long; bracteoles minute, triangular; pedicels 15-18 mm. long, in fruit up to 25 mm. *Sepals* subequal, green with white margin, carinate along the midrib, narrowly triangular to ovate-lanceolate, gradually narrowed towards the apex, 4.5-6 mm. long. *Corolla* violet-blue or purple, with a white tube. but in S. Africa usually the form with bright light blue flowers is seen (known as "Heavenly Blue"), funnelshaped, 4.6 cm. long and as much in diam., glabrous. *Capsule* ovoid, mucronate by the style-base, 8-10 mm. long. *Seeds* black, about 5 mm. long, minutely puberulent.

A native of tropical America (extending into Mexico), widely cultivated in many tropical countries and occasionally run wild, e.g. in Malesia (cf. Van Ooststroom 1953).

This species is cultivated in several places in the Union, such as Durban, Johannesburg, Pretoria, Irene, Warmbaths. There are two specimens among those I have seen from Southern Africa which were not expressly stated to be cultivated and they may be escapes from culture. These two specimens are: *Boss* s.n. from the Angolan border, South West Africa (PRE) and *Torre* 1410 from Nampula, Niassa, Portuguese East Africa (COI). The label on the specimen *Torre* 1410 suggests that the plant was actually growing as a wild plant and was not cultivated.

36. *Ipomoea coptica* (L.) Roth ex R. et S., Syst. Veg. 4 (1819), p. 208; Roth. Nov. Pl. Spec. (1821), p. 110; Choisy in DC., Prodr. 9 (1845), p. 384; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 147, id. 28 (1899), p. 45; Van Ooststr. in Blumea 3 (1940), p. 544, and in Van Steenis, Fl. Males., Ser. I, 4-4 (1953), p. 479; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 31 (1956), pl. 1217a. *Convolvulus copticus* L., Mant. 2, App. (1771), p. 559. *Ipomoea dissecta* Willd., Phytogr. (1794), p. 5, t. 2; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 67; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 176; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 218.

Type: One of the specimens in the Linnaean Herbarium is to be taken as the lecto-type (photographs in PRE).

Annual, quite glabrous except the very base of the stamens. *Stems* several from the base, herbaceous, prostrate or climbing, up to 1.50 m. long, 4-angled, longitudinally striate and often finely muriculate especially on the angles. *Leaves* pseudostipulate by the leaves of developing or suppressed axillary shoots, orbicular to ovate in outline, 2-8 cm. long and wide, digitately compound with 5 (-7) ovate to oblong, lanceolate or oblanceolate, coarsely serrate to deeply and irregularly (in some forms twice) pinnatilobed, to pinnatisect segments; the middle lobe longest, lateral lobes gradually smaller, all lobes more or less petioluled, acute or subacute at the apex, herbaceous, slightly fleshy drying thin and papery; pseudostipules resembling the leaves, but smaller, up to 2 cm. in diam.; petioles resembling the stems but usually a little thinner, 1-5 cm. long. *Peduncles* cymosely 1-3-flowered, resembling the stems, 1-4 cm., in fruit up to 6 cm. long; bracteoles setose to lanceolate, minute, acute, entire, 1-3 mm. long, or in some specimens larger and palmately laciniate like the leaves; pedicels at first erect, in fruit bent downwards, thickening upwards, 4-8 mm. long. *Sepals* subequal, oblong or elliptic, sub-acute, minutely apiculate, 4-5 mm. long and about 1.5 mm. wide, thinly coriaceous, muriculate in 3 (outer ones) to 1 (inner ones) vertical lines, accrescent to 6 mm. long and 3 mm. wide in fruit. *Corolla* funnelshaped, dull white or pale cream tinged with pale mauve on the tube outside, about 12 mm. long, the spreading limb 5-lobed-5-angled with mucronate lobes, 10-12 mm. in diam. *Capsule* depressed-globose, brown when ripe, 6-7 mm. in diam., minutely apiculate, 3-celled and dehiscent by (4-) 5-6 valves. *Seeds* 6 or less by abortion, triquetrous, dark brown, covered with a grey or silvery-white silky tomentum except on the black circular hilum, 2-3 mm. long.

Tropical Africa, extending into South West Africa and the Transvaal, Sudan, also in tropical Asia and North Australia.

S.W. AFRICA.—Recorded from the N. part as far south as Okahandja.

BECHUANALAND.

TRANSVAAL.—Zoutpansberg, Pietersburg, Waterberg, Pretoria, Groblersdal, Kruger National Park, Barberton. On account of its small flowers possibly often overlooked; this plant is for instance common around Warmbaths and in the Pretoria district, but is represented in all the S. African herbaria by not more than 35 gatherings.

37. *Ipomoea dasysperma* Jacq., Eclog. I (1811-1816), p. 132, t. 89; Choisy in DC., Prodr. 9 (1845), p. 386; C. B. Clarke in Hook. f., Fl. Br. Ind. 4 (1883), p. 215; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 148; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 179; Skan in Bot. Mag. 145 (1919), t. 8788; Ooststr. in Blumea 3 (1940), p. 580. *Convolvulus pedatus* Roxb., Hort. Beng. (1813), p. 14, nomen nudum, and in Fl. Ind., Ed. Carey, I (1832), p. 478. *Ipomoea odontosepala* Baker in Kew Bull. 1894, p. 73; Baker & Rendle op. cit., p. 180. *I. saccata* Hall. f. in Engl. Bot. Jb. 28 (1899), p. 48; Baker & Rendle, op. cit., p. 180, ex descr. *I. calcarata* N. E. Brown apud Baker & Rendle, op. cit., p. 180, and in Kew Bull. 1909, p. 124.

Type: Jacquin's plate was taken to be representative.

Annual glabrous herbaceous climber. *Stems* slender, attaining 2 m. or more. *Leaves* herbaceous, broadly-cordate-ovate in outline, 3–10 cm. in diam., pedately tripartite, to twice tripartite, terminal segment 3-sect, lateral ones 2- or 3-sect or occasionally entire; segments lanceolate, linear, lanceolate or elliptic, acute to acuminate, entire, 0.4–2 cm. wide; petioles 2–6 cm. long, often pseudostipulate by the leaves of young or suppressed axillary shoots. *Peduncles* 1–8 cm. long, 1–3, occasionally many-flowered, bracteoles minute, pedicels 0.5–3 cm. long, subclavate, thicker than the peduncle. *Sepals* coriaceous with thinner margins, elliptic to ovate or oblong, obtuse, 7–10 mm. long and 5–6 mm. wide, outer ones sometimes a little shorter than the inner ones and with 2 or 1 saccate or calcarate or gibbous basal processes, sometimes almost spurred. *Corolla* hypocrateriform-funnel-shaped, with spreading subentire limb; the tube pale mauve outside, darker mauve or bright magenta inside, 2–4 cm. long sometimes longer; the limb bright yellow, paler outside, up to 7 (–10) cm. in diam.; midpetaline areas distinct, somewhat greenish. *Capsule* subglobose, about 1 cm. in diam., glabrous. *Seeds* about 6 mm. long, densely villous and often also with long cottony hairs on the angles.

Widely distributed, but according to Skan (l.c.) very probably not native in some of the localities from which it is recorded. Judging by some of the African localities (S.W. Africa, Bechuanaland, Nubia, Abyssinia) where this plant was collected 50–100 years ago, it seems to be indigenous to Africa. In addition it is found in India and Ceylon. There is no satisfactory evidence that it is native in China or Australia, and Van Ooststroom (l.c.) reported that the records from Java all referred to specimens formerly cultivated in the Botanical Garden of Buitenzorg. In Africa recorded from Nubia, Abyssinia, E. Africa, S. Rhodesia, Bechuanaland, S.W. Africa.

S.W. AFRICA.—Grootfontein, Tsumeb: *Dinter* 2506, 3019 (SAM), 7451 (BOL); Namutoni: *Barnard* 223 (SAM); without precise locality, but probably nr. Grootfontein: *Schoenfelder* S835 (PRE).

S. RHODESIA.—Nr. Victoria Falls: *Flanagan* 3293 (BOL).

Most of the above-mentioned identities were already established by Skan. The type of *I. saccata* Hall. f. (*Stuhlmann* 210) was probably destroyed, but I feel very confident about its reduction to *I. dasysperma*. There is some variation in the inflorescence (flowers solitary or in cymes), in the size of the flowers and in the development of the pouches at the base of the outer sepals, but there is no reason to distinguish more than one species.

Skan (l.c.) mentions *Calonyction trichospermum* var. *diversifolium* as a synonym of *I. dasysperma*, but van Ooststr. (op. cit., p. 578) retains *Ipomoea trichosperma* Bl. as a distinct species, occurring in Java, Celebes and the lesser Sunda Islands.

For the differences between *I. cairica*, *I. heptaphylla* and *I. dasysperma* see under *I. heptaphylla*.

38. *Ipomoea cairica* (L.) Sweet, Hort. Britt. Ed. 1 (1827), p. 287; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 148; Hutch. and Dalz., Fl. W. Trop. Afr. 2 (1931), p. 216; Ooststr. in Blumea 3 (1940), p. 542, and in Steenis, Fl. Males., Ser. I, 4.4 (1953), p. 479; Brenan in Mem. New York Bot. Garden 9 (1954), p. 8. *Convolvulus cairicus* L., Syst. Ed. 10 (1759), p. 922. *Ipomoea palmata* Forsk., Fl. Aeg.-Arab. (1775), p. 43; Choisy in DC., Prodr. 9 (1845), p. 386; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 66; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 178.

Type: Most probably the specimen in the Linnean herbarium listed as "*I. cairensis*", which agrees with the conception of this species by all authors.

Glabrous *twiner* with tuberous root. *Stems* smooth or tuberculate, high climbing or occasionally prostrate. *Leaves* ovate to orbicular in outline, herbaceous, 3–10 cm. in diam., deeply palmately dissected into 5–7 lanceolate, elliptic, ovate-elliptic, ovate-lanceolate or somewhat oblanceolate segments, obtuse or acute, mucronulate, narrowed at the base; basal lobes often bilobed in 5-lobed leaves; petioles 2–6 cm. long, usually pseudostipulate by small leaves of developing or suppressed axillary shoots; pseudostipules resembling the leaves but smaller. *Peduncles* 1- to few-flowered; 0.5–7 cm. long; bracteoles minute; pedicels 12–20 mm. long. *Sepals* subequal or the outer ones a little shorter, thick, green with pellucid dots and with pale, scarious margins, often minutely tuberculate outside, 4–6.5 mm. long; outer ones ovate, obtuse to subacute, mucronulate, inner ones broader, obtuse, mucronulate. *Corolla* broadly funnel-shaped, with the tube contracted near the base at the place of insertion of the stamens, mauve, paler outside and with darker magenta centre (rarely entirely white), 3–5 cm. long and 4–6 cm. in diam. *Capsule* subglobose, glabrous, 8–12 mm. in diam. *Seeds* 5–6 mm. long, densely and shortly tomentose and with white, up to 9 mm. long silky hairs along the edges.

Africa, tropical Asia, naturalised elsewhere.

Recorded from the *Cape Province* (Uitenhage, Pt. Elizabeth, East London, Komgha, Kentani, Port St. Johns); *Natal* (Durban, Pinetown, Pietermaritzburg, Inanda, Mtunzini, Nongoma and several other localities in Zululand); *Transvaal* (Barberton, Lydenburg, Zoutpansberg; cultivated elsewhere, e.g. in Pretoria distr.). In addition Portuguese East Africa, Southern Rhodesia, Angola, etc. Although South West Africa is mentioned among the localities in Fl. Trop. Afr., I have not seen a single specimen from that area. Frequently cultivated (in S. Africa as “Messina creeper”) and some localities may refer to cultivated or naturalised specimens.

I. cairica has often been confused with “*I. pulchella* Roth.” (= *I. heptaphylla*) which has smaller flowers, but can easily be distinguished from related species by the characters given in the key. See also under *I. heptaphylla*.

39. *I. hochstetteri* House in Ann. New York Acad. Sci. 18 (1908), p. 223; A. Meeuse in R. A. Dyer, Flow. Pl. Afr. 30 (1955), pl. 1189. *I. quinquefolia* Hochst. ex Hall. f. in Engl. Bot. Jb. 18 (1893), p. 147, and in Bull. Herb. Boiss. 6 (1898), p. 545 (as var. *albiflora* Hall. f.); Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 66, excl. var. *pubescens* Baker; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 177, non L. (1753). *I. quinquefolia* Hochst. ex Hall. f. var. *purpurea* Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 546; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 66; Baker and Rendle, op. cit., p. 178. *I. kwebensis* N.E.Br. in Kew Bull. 1909. p. 123.

Type: Hallier (1893) quotes “*Ipomoea quinquefolia* Hochst. mss. in Herb. Boiss.”, so that the specimen on which Hochstetter had written this name can only be the specimen *Schimper* 321 in herb. Geneva and this must be the type. (Hallier, l.c., only cited one additional specimen, *Stuedner* 954, in Herb. Berlin, which was destroyed.)

Annual, glabrous, herbaceous *climber*, occasionally prostrate when no support is available. *Stems* several from the base, terete, smooth or finely striate, occasionally somewhat muriculate, up to several metres long. *Leaves* digitately 5-lobed, 4–10 (–12) cm. in diam.; lobes oblong or elliptic to ovate-lanceolate or lanceolate, attenuated at both ends, obtuse to acuminate, mucronate, the base much narrowed and subpetioluled, bright green, herbaceous and somewhat succulent drying papery, entire or one or both of the basal ones with a lateral lobule up to 2.5 cm. long and leaf apparently 6–7-lobed; central lobe up to 7 by 3 cm., lateral ones gradually smaller, petioles pseudostipulate at the base by young leaves of developing axillary shoots, often somewhat muriculate, up to 7 cm. long. *Inflorescences* cymosely 3–6-flowered or occasionally

by reduction 1-flowered; peduncles usually 2–5 cm. long, sometimes shorter, rarely longer; bracteoles minute, subulate, deciduous; pedicels stoutish, subclavate, 0.5–3 cm. long. *Calyx* densely and finely muriculate, 7–8 mm. long; sepals erect, sub-equal, ovate-oblong or lanceolate, acute and with a fine mucro; inner ones with hyaline edges. *Corolla* purplish mauve or white, funnel-shaped, 20–25 mm. long and about 25 mm. in diam., the limb spreading, slightly 5-lobed; midpetaline areas well-defined, smooth. *Capsule* tightly enclosed by the persistent calyx, globose, very shortly apiculate, muriculate when young, less distinctly so when ripe, 8–9 mm. in diam. *Seeds* dark brown, velvety pubescent and often with very long, soft silky hairs on the edges.

From Abyssinia to S.W. Africa, Transvaal and Natal. According to Mr. de Winter also in India.

S.W. AFRICA.—Grootfontein: *Schoenfelder* S 570 (PRE), prob. Grootfontein: *Schoenfelder* S 848 (PRE); Namutoni-Sandup: Barnard 216 (SAM). Okahandja: *Dinter* 131 (SAM); Otjisaza-road: *Dinter* 2585 (SAM). Otjiwarongo, Waterberg: *Bradfield* 405 (PRE).

CAPE PROVINCE.—Nr. Mafeking (Vryburg): *Bolus* 6460 (BOL).

TRANSSVAAL.—Pretoria, subsponaneous or spontaneous in garden of Div. of Botany: *Meeuse* 9074, 9075, 9076; Roodeplaat Exp. Farm: *Vermeulen* s.n.; nr. Hammanskraal: *Codd* 2740, *Meeuse* 9512; nr. Pienaars River Station: *Codd* 4040. Warmbaths, Warmbaths: *Meeuse* 9077, 9078 (PRE). Waterberg, Naboomspruit, Mosdene: *Galpin* M 238. Potgietersrust, nr. Grass Valley: *Meeuse* 9562 (all in PRE). Pietersburg: *Rogers* 14136 (BOL); Chunies Poort: *Codd & Dyer* 7756 (PRE). Zoutpansberg, between Louis Trichardt and Pietersburg: *Schweickerdt and Verdoorn* 665 (PRE); Wylies Poort: *Rodin* 4229 (PRE). Letaba, The Gorge: *v. d. Schijff* 3025 (PRE). Pilgrims Rest, Satara: *v. d. Schijff* 2254 (PRE). Nelspruit, Skukuza: *v. d. Schijff* 2737 (PRE).

NATAL.—“Thorns”: *Wood* 4428 (NH, BOL: one of the original numbers quoted by Hallier under this var. *purpurea*). Tugela Burns: *Evans* H. no. 19958 (NH).

BECHUANALAND.—Mochudi: *Harbor* in Herb. *Rogers* no. 6519 (BOL); prob. Mochudi: *Rogers* 6381 (BOL).

S. RHODESIA.—Bulawayo: *Rogers* 5753 (BOL); *Martineau* 337 (SRGH). Hartley: *Hornby* 3137 (SRGH).

CULTIVATED SPECIMEN.—In Nat. Bot. Gardens Kirstenbosch ex Potgietersrust, N.B.G. no. $\frac{321}{28}$ (BOL).

House renamed *Ipomoea quinquefolia* Hochst. ex Hall. f., on account of *I. quinquefolia* L.

The two “varieties” distinguished by Hallier in 1898 (var. *albiflora* and var. *purpurea*, respectively) cannot be maintained. White- and purple-flowered specimens are often found growing together, as well as prostrate and climbing plants. N. E. Brown, who raised the var. *purpurea* to specific rank under the name *I. kwebensis* stated: “(*I. kwebensis* differs from *I. quinquefolia* Hochst.) in that it is probably perennial with very long twining stems, nearly or quite glandless petioles and purple flowers. *I. quinquefolia* Hochst. has annual, short prostrate stems that show no tendency to twine, glandular-tubercular petioles, white flowers and has hitherto only been found in Abyssinia”. However, the twining plants are also annuals, not perennials, and can be white- or purple-flowered. Purple-flowered ones can be prostrate. Mr. de Winter, who saw an isotype of *I. hochstetteri* and various authentic specimens referred to the var. *purpurea* by Hallier or to *I. kwebensis* by N.E.Br., reported that they can hardly be different and I fully agree with him.

I. hochstetteri is much more common in S. Africa than *I. heptaphylla*.

I. quinquefolia var. *pubescens* Baker is *Merremia verecunda* Rendle (q.v.).

40. ***Ipomoea heptaphylla*** (Rottl. et Willd.) Voigt, Hort. Suburb. Calc. (1845), p. 360. *Convolvulus heptaphyllus* Rottl. et Willd. in Ges. Naturf. Fr., Neue Schr. 4 (1803), p. 196. ? *Ipomoea pulchella* Roth, Nov. Pl. Spec. (1821), p. 115; Choisy in DC., Prodr. 9 (1845), p. 386; Hall. f. in Bull. Herb. Boiss. 7 (1899), p. 55, and in Engl. Bot. Jb. 28 (1899), p. 48 (inclus. var. *arachnosperma* Hall. f.); Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 177; House in Ann. New York Acad. Sci. 18 (1908), p. 222; Ooststr. in Blumea 3 (1940), p. 544, in obs. and in Steen., Fl. Males. Ser. I. 4·4 (1953), p. 479, in nota.

Type: Rottler in herb. Willdenow no. 3721 (Berlin).

Herbaceous, glabrous, probably annual, *climber*. *Stems* very slender, subterete, up to at least 1 m. long. *Leaves* pseudostipulate by the leaves of developing or suppressed axillary shoots, herbaceous, drying thin, orbicular in outline, 2–6 cm. in diam., deeply palmately 5-lobed, the lowermost lobes usually with a small lobe on the outside; lobes elliptic to lanceolate, usually obtuse, minutely mucronate, narrowed and subpetioluled at the base, entire; petioles usually a little longer than the blade, sometimes somewhat muriculate; pseudostipules resembling the leaves but much smaller. *Peduncles* usually shorter than the leaves and often shorter than the petiole of the subtending leaf, very slender, almost filiform, terete, 1-flowered to cymosely 2–3-flowered; bracteoles minute: pedicels shorter and (much) thicker than the peduncle, somewhat subclavate. *Sepals* thinly coriaceous, ovate to orbicular, subequal with membranous edges, usually obtuse or rounded, sometimes muriculate near the base, 3–4 mm. long. *Corolla* funnel-shaped with subcylindric tube, and spreading limb, purplish mauve, 12–18 mm. long and as much in diam. *Capsule* subglobose or ovoid, 8–10 mm. long and 6–8 mm. in diam., glabrous. *Seeds* pubescent and usually also with long white hairs on the edges, 5–6 mm. long.

Tropical America and West Indies, tropical Africa. India.

TRANSVAAL.—Zoutpansberg, Messina: *Young* s.n. = Moss 14607 (J, PRE). Letaba, the Gorge: *Smuts & Gillett* 3535 (PRE).

PORTUGUESE E. AFRICA.—Sul do Save, Guija: *Myre* 31 (LM, PRE); nr. Sabi River, Meringua's Kraal: *Chase* 2548 (SRGH).

ANGOLA.—nr. Coroca Riv.: *Baum* 11 (COI).

S. RHODESIA.—Wankie, Dekka River: *Eyles* 7968 (SRGH).

TANGANYIKA.—Central Province, Lake Kimagai: *Hornby & Hornby* 811 (PRE).

Hallier (Bull. Herb. Boiss. 7) has indicated that the type is still extant. Hallier accepted its identity with *I. pulchella* Roth ex descriptione; this identity had already been suggested by Choisy. The name *Convolvulus heptaphyllus* Rottl. et Willd. is the oldest name and is also the first use of the specific epithet in *Convolvulus*.

Mr. de Winter reported that he had seen an original sheet at Kew annotated by Voigt. This sheet contains a mixture of *I. heptaphylla* and of *I. hochstetteri*, which is irrelevant as far as the combination *I. heptaphylla* (Rottl. et Willd.) Voigt is concerned, but may throw some doubt on the identity of *Ipomoea pulchella* Roth, because obviously both *I. heptaphylla* and *I. hochstetteri* occur in India and without a type specimen it is impossible to decide which form was described by Roth. If the plant described as *I. pulchella* by this author was the same as *I. heptaphylla* Voigt, it is merely a synonym, but if it was the same plant as *I. hochstetteri* the latter name has to be replaced by *I. pulchella* Roth. I prefer to regard *I. pulchella* as a synonym

of *I. heptaphylla* Voigt, as was done by Choisy, Hallier and others and retain the name *I. hochstetteri* for the other species. Both *I. heptaphylla* and *I. hochstetteri* are represented by types and, therefore, well defined, whereas *I. pulchella* Roth is dubious.

Although I have not seen the type specimen of *I. heptaphylla*, I saw the specimen *Baum* 11 referred to this species by Hallier. Other specimens referred to *I. pulchella* by Hallier and quoted in *Fl. Trop. Afr.* make it perfectly clear that *Convolvulus heptaphyllus* Rottl. et Willd. is the species with the filiform peduncles (see below).

The differences between *I. heptaphylla* and *I. hochstetteri* seem to be constant, but the best distinguishing character is the shape of the peduncle, which is very thin and filiform in *I. heptaphylla* and much stouter in *I. hochstetteri*. In addition, the corolla seems to be always mauvish-purple in *I. heptaphylla* (sometimes white in *I. hochstetteri*).

I. heptaphylla has, according to Van Oostroom, often been confused with *I. cairica*. The following table shows the differences between *I. heptaphylla*, *I. hochstetteri*, *I. cairica* and *I. dasysperma*:—

| | <i>I. heptaphylla.</i> | <i>I. hochstetteri.</i> | <i>I. cairica.</i> | <i>I. dasysperma.</i> |
|------------|---|--|--|--|
| Leaves.... | Palmately 5 (-7)-fid | Palmately 5 (-7)-fid | Palmately 5 (-7)-fid | Pedately (7-) 9-fid ("twice ternate"). |
| Calyx..... | Smooth or sometimes muriculate, sepals often obtuse, usually 3-4 mm. long | Usually muriculate; sepals usually acute, usually 5-6 mm. long | Often minutely muriculate; sepals obtuse to subacute, 4-6.5 mm. long | Smooth or rugose; sepals very obtuse or rounded outer ones saccate at the base, 8-10 mm. long. |
| Corolla... | Mauvish-purple 12-18 mm. long | White or mauvish-purple usually 20-25 mm. long | Mauve, 3-5 cm. long | Yellow with pale mauve tube, 3-7 cm. long. |
| Peduncles. | Very thin, filiform (especially at the base) | Fairly stout, considerably thicker than those of <i>I. heptaphylla</i> | | |

41. *I. alba* L., *Sp. Pl.* ed. 1 (1753), p. 161; Hall. f. in *Meded. Rijksherb.* Leiden 1 (1911), p. 25, and 46 (1922), p. 19; Ooststr. in *Blumea* 3 (1940), p. 547 and in Steenis, *Fl. Males.* Ser. I. 4, 4 (1953), p. 480. *Convolvulus aculeatus* L., *Sp. Pl.* ed. 1 (1753), p. 155. *Ipomoea bona-nox* L., *Sp. Pl.* ed. 2 (1762), p. 228. *Calonyction speciosum* Choisy in *Mém. Soc. Phys. Genève* 6 (1833), p. 441, t. I, f. 4, excl. var. β , and in DC., *Prodr.* 9 (1845), p. 345, excl. var. γ ex parte et var. δ ; Hall. f. in *Engl. Bot. Jb.* 18 (1893), p. 153; Baker & Rendle in *Dyer, Fl. Trop. Afr.* 4, 2 (1905), 117. *Calonyction bona-nox* (L.) Boj., *Hort. Maurit.* (1837), p. 227; Hall. f. in *Bull. Herb. Boiss.* 5 (1897), p. 379, 1028. *Calonyction aculeatum* (L.) House in *Bull. Torrey Bot. Cl.* 31 (1904), p. 590; Hutch. & Dalz., *Fl. W. Trop. Afr.* 2 (1931), p. 213.

Type: Linnaeus based *I. alba* on "Rheede, mal. II, 101, t. 49". Apparently not represented in the Linnean herbarium.

Glabrous (or rarely pubescent) *perennial twiner*. *Stems* herbaceous up to 4 mm. thick, laticiferous, terete, smooth or sometimes muriculate, up to 5 m. long. *Leaves* thin, herbaceous, ovate to orbicular in outline to oblong or ovate-oblong, entire or

3-lobed (often on the same plant), 6–20 cm. long and 5–16 cm. wide; margin entire, apex acuminate with acute or obtuse, mucronulate acumen, base cordate with broad or narrow rounded sinus and broadly rounded to angular basal auricles; petioles slender, 5–20 cm. long. *Inflorescence* 1- to several-flowered, cincinnate or dichasial: peduncle stout, terete, 1–24 cm. long; bracteoles small, deciduous; pedicels 7–15 mm. long, in fruit much thickened and clavate and up to 30 mm. long. *Sepals* coriaceous, elliptic, glabrous, unequal, 2 or 3 outer ones shorter, 5–10 mm. long, and with a long, thick, recurved or patent, 4–8 mm. long awn; inner ones 8–15 mm. long, mucronulate with a much shorter and thinner 2–3 mm. long apiculum; all often reflexed in fruit. *Corolla* opening at night, fragrant, hypocrateriform, white; the tube 7–12 cm. long, the limb 11–14 cm. in diam. when fully expanded. *Capsule* ovoid, mucronate, glabrous, 2.5–3 cm. long. *Seeds* brown or black, glabrous, smooth, 10–12 mm. long, 7–8 mm. wide.

Circumtropical, originally from tropical America [cf. Hallier (1922), p. 19]. In S. Africa cultivated and occasionally found as an escape (Queenstown, Coast of Natal).

42. *I. riparia* G. Don, Gen. Syst. 4 (Febr. 1838), p. 265; Choisy in DC., Prodr. 9 (1845), p. 153; Exell, Catal. Vasc. Pl. S. Thomé (1943), p. 251; Van Ooststr. in Van Steenis, Fl. Males., Ser. I. 4·4 (1953), p. 484; Brenan in Mem. New York Bot. Garden 9 (1954), p. 8. *I. lilacina* Bl., Bijdr. Fl. Ned. Ind. (1825), p. 716, non Schrank (1822); Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 187; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 215. *I. baclei* Choisy in Mém. Soc. Phys. Genève 8 (1838), p. 60, t. 2. *Pharbitis fragrans* Boj., Hort. Maurit. (1837), p. 227, nomen nudum, ex Choisy in DC., Prodr. 9 (1845), p. 341 (descr.) *I. fragrans* (Boj. ex Choisy) Boj. ex Choisy, op. cit. (1845), p. 341, in syn., et p. 393; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 153; Van Ooststr. in Blumea 3 (1940), p. 564. *I. parkeri* Choisy, op. cit. (1845), p. 381. *I. parkeri* Choisy var. *subsericea* Meissn. in Mart. Fl. Bras. 7 (1869), p. 284; Van Ooststr. in Pulle, Fl. Surinam 4 (1932), p. 92.

Type: Don s.n. in BM (fide Exell, l.c.).

A perennial twiner, mostly occurring in marshes, along rivers and in marshy forests. *Stems* terete, finely striate when dry, densely short-pilose with soft white hairs. *Leaves* broadly ovate to orbicular, acuminate at the apex with obtuse or acute mucronulate point, broadly cordate at the base, densely pilose beneath, much more sparsely so and ultimately glabrescent above, 5–12 cm. long and 4–10 cm. wide; nerves 7–9 on each side; petiole slender, 3–10 (–12) cm. long, pilose like the stems. *Peduncles* pilose like the stem but often glabrous or nearly so in the lower portion, terete, 2–12 cm. long, cymosely 1–few-flowered with very short cyme branches and consequently flowers subumbellate; pedicels pilose, mostly longer than the calyx, 7–14 mm. long; bracts ovate, minute. *Sepals* equal in length, 7–10 mm. long; the two outer ones elliptic-oblong, acute, shortly pilose; the inner ones broader, ovate-elliptic, less acute. *Corolla* funnel-shaped, mauve with darker centre, 4–5 cm. long; mid-petaline areas with sericeous hairs outside. *Capsule* globose, glabrous, about 12 mm. in diam.; valves brown outside, whitish inside. *Seeds* 6 mm. long, white-villous.

Distribution.—Tropical America (known as *I. parkeri* until Van Ooststroom established its identity with *I. lilacina* Bl.), tropical Africa, Madagascar, Malesia. Extending into the northern part of S.W. Africa (Okavango marshes) and Bechuanaland.

SOUTH WEST AFRICA.—Niangana, in reeds on the Okavango: *Dinter* 7205 (BOL, PRE); Okavango Reserve: *Maguire* 1653 (NBG).

BECHUANALAND PROT.—Okavango, among reeds: *Schoenfelder* S 176 (PRE); *Story* 4768 (PRE). Chobe River, Kasane: *Van Son* h. no. 28686 (PRE).

As regards the synonymy, the oldest name *I. lilacina* Bl. is illegitimate on account of *I. lilacina* Schrank. The names following in priority are *I. riparia* G. Don and *I. baclei* Choisy, both published in 1838, but Exell (l.c.) has pointed out that *I. riparia*, published in February 1838, is almost certainly older than Choisy's name, which was used for the first time by Choisy in a paper read for the Soc. Phys. at Geneva by the end of January 1838. This paper was, therefore, probably not published in the "Mémoires" of that society as early as February of the same year.

According to Van Oostroom (private communication) the African specimens are in every respect identical with the Asiatic ones.

I. riparia is a real marsh plant and is always reported on collectors' labels as growing "among reeds", "near edges of pools", "along rivers", "in marshes", etc.

43. *I. digitata* L., Syst. Nat. ed. 10 (1759), p. 924; Choisy in DC., Prodr. 9 (1845), p. 389; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 64; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 189; Hutch. & Dalz., Fl. W. Trop. Afr. 2 (1931), p. 216; Van Ooststr. in Blumea 3 (1940), p. 558, and in Van Steenis, Fl. Males., Ser. 1.4.4 (1953), p. 483. *Convolvulus paniculatus* L., Sp. Pl. Ed. 1 (1753), p. 156. *Ipomoea paniculata* (L) R. Br., Prodr. Fl. Nov. Holl. ed. 1 (1810), p. 486; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 149 and in Bull. Herb. Boiss. 5 (1897), p. 393, non *I. paniculata* Burm. f. (1768).

Type: (Not represented in the Linnean Herbarium).

Large glabrous perennial twiner, occasionally prostrate. Roots tuberous. *Stems* terete, glabrous, hollow, becoming woody. *Leaves* orbicular in outline, palmately dissected to or mostly beyond the middle (or, in the var. *eriosperma* ovate-cordate, entire or shallowly lobed) cordate or truncate at the base, 6–14 cm. long and 6–15 cm. wide, segments (3–) 5–7 (–9), lanceolate to ovate, entire, acuminate to obtuse, minutely mucronate; middle lobe 5–9 cm. long and 1.5–3 cm. wide, lateral lobes shorter; petioles smooth or muriculate 3–10 cm. long. *Peduncles* terete but often angular near the apex, cymosely branched near the apex, few-flowered, 2.5–20 cm. long; pedicels terete, 9–25 mm. long. *Sepals* equal or the outer ones shorter, all suborbicular or the outer ones narrower, oblong to broadly elliptic, obtuse, concave, much imbricate, coriaceous, 6–11 mm. long. *Corolla* funnel-shaped with spreading limb, mauve with darker mauve centre, 5–6 cm. long and 6–7 cm. in diam., glabrous. *Capsule* globose or ovoid, obtuse, glabrous, 8–10 mm. in diam., 12–14 mm. long. *Seeds* black, with long woolly-sericeous, easily detachable whitish hairs, 5–7 mm. long.

Circumtropical.

NATAL.—Durban, near Durban: *Krauss* 94 (BOL), *Wood* 10319 (NH, PRE). Lower Tugela, Kearsney: *Milner* H. no. 23403 (NH). Hlabisa: *Codd* 7005 (PRE). Ingwavuma: *Ward* 2025 (PRE).

In addition Angola, Portuguese East Africa and West and East tropical Africa (apparently not in Southern Rhodesia or Bechuanaland).

Ipomoea digitata L. var. *eriosperma* (P. Beauv.) Rendle in Dyer Fl. Trop. Afr. 4, 2 (1905), p. 190 (sphalm. "var. *eriocarpa*"); Ooststr., op. cit. (1953), p. 484.

This variety differs from typical *I. digitata* var. *digitata* in that the leaves are entire to shallowly lobed instead of palmately divided to or below the middle.

It has not been recorded from South Africa, but a specimen leg. *Myre et Carvalho* (no. 100) from Maputo, Sul do Save, Portuguese East Africa (PRE) was collected close to the Zululand border.

44. *I. albivenia* (Lindl.) Sweet, Hort. Brit., Ed. 2 (1830), p. 372; Choisy in DC., Prodr. 9 (1845), p. 379; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 151; Wood, Natal Pl. 1 (1899), p. 32, t. 38; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 59. *Convolvulus albivenius* Lindl. in Bot. Reg. 13 (1827), t. 1116. *Ipomoea gerrardi* Hook f. in Bot. Mag. (1867), t. 5651; Hall. f., l.c. and in Engl. Bot. Jb. 28 (1899), p. 51, in obs.

Type: As the description was made from a living specimen, the type actually is the plate in Bot. Reg. (t. 1116). However, there may be a herbarium specimen extant made of the same plant which could be taken as representing the type. The species in question is so distinct that there can be no doubt about its identity, in spite of Lindley's description of the calyx as being glabrous (it is, in fact, always somewhat hairy, at least near the base).

Perennial climber. Stems shrubby, when young herbaceous with white somewhat flosse tomentum, soon glabrous, older ones becoming woody, attaining 10 m. and over in length. *Leaves* broadly cordate or sub-orbicular-cordate to cordate-reniform, occasionally ovate or oblong, 3–10 (–17) cm. long and 3–10 (–16) cm. wide, rather firm in texture, shallowly and widely cordate to truncate at the base, rounded to cuspidate at the apex, entire to sinuately or somewhat crenate, when very young covered on both sides with a white floccose tomentum, both sides glabrescent but on the lower side the tomentum persists longest as a reticulate tomentum on the main nerves and veins, ultimately sometimes quite glabrous; petioles rather slender, white-tomentose, usually persistently so, 1–6 (–8) cm. long. *Peduncles* very short, 1-flowered, tomentose; bracteoles usually longer than the calyx, linear-spathulate or oblong-spathulate, membranous, brown, glabrous inside, thinly floccosely tomentose outside, early deciduous (not minute as stated in Fl. Cap.); pedicels short, tomentose. *Sepals* broadly oblong, ovate-orbicular, ovate, elliptic or obovate-oblong, obtuse, chartaceous, much imbricate, 11–15 mm. long, originally densely floccosely tomentose, glabrescent, retaining the pubescence longest at the base, in fruit ultimately spreading to reflexed. *Corolla* funnel-shaped, white, 6–9 cm. long and the limb 6–8 cm. in diam., glabrous. *Capsule* ellipsoid or somewhat ovoid, 16–22 mm. long and 12–16 mm. in diam., brown, with glabrous, coriaceous valves, apiculate. *Seeds* brown, 7–9 mm. long, densely covered with very long cottony white hairs, giving the dehisced capsule the appearance of a ripe cotton ball.

South Africa (Natal, Transvaal), Portuguese East Africa and the eastern part of Southern Rhodesia.

Recorded from *Natal and Zululand*: northern districts as far south as Weenen, Greytown and Mt. Edgecombe; *Transvaal*: Barberton, Lydenburg, Pietersburg, Potgietersrust and the districts N. and E. of these; sometimes locally abundant.

The name is often cited as "*I. albivenia* (Lindl.) G. Don., Gen. Syst. 4, p. 270", but the correct citation is the one given above.

Ipomoea gerrardi Hook. f. is a synonym. One of the differences given is that this plant is more hairy than *I. albivenia*, but the differences are very slight. In herbarium specimens the calyx of open flowers is very rarely glabrous and, in my opinion, the specimen figured in Bot. Reg. may have been slightly atypical because it was grown in a hothouse. Lindley obtained his seeds from Forster and quotes "Algoa Bay" as the locality. It is obvious that his should be "Delagoa Bay".

As a rule this plant is very distinct on account of the typical reticulate pubescence on the veins of the young leaves. The older leaves are glabrescent and this is a good distinguishing character against *I. verbascoidea* = *I. dammarana* (which has a persistent tomentum on the lower surface of the leaves), even if young leaves are lacking. Other related species are even more completely geographically separated from *I. albivenia* than *I. verbascoidea* and differ in some other respects. *I. marmorata* Britten & Rendle, *I. grandiflora* Lamk. and *I. lapidosa* Vatke have hypocrateriform corollas and glabrous sepals.

45. *I. verbascoidea* Choisy in DC., Prodr. 9 (1845), p. 356; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 151; Baker and Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 183. *I. dammarana* Rendle in Jl. Bot. 34 (1896), p. 36; Baker & Rendle; op. cit., p. 183. *I. conceiroi* Rendle in Jl. Bot. 46 (1908), p. 182. *I. seineri* Pilger in Engl. Bot. Jahrb. 41 (1908), p. 297; Dinter in Fedde, Repert. 18 (1922), p. 431, e descr.

Type: A specimen "ex Angola" in herb. Paris (photograph of type in PRE).

Suberect to climbing perennial shrub. *Stems* terete, woody, 1–2 m. long in suberect specimens, often longer in climbing ones, densely covered with a whitish, somewhat floccose tomentum as are the leaves, petioles, peduncles, bracts and sepals. *Leaves* firm, varying from suborbicular to cordate-oblong, acute or obtuse to apiculate, cordate or truncate at the base, entire, or somewhat sinuous or crenate, 4–15 cm. long and 3–17 cm. wide, upper surface thinly, lower surface densely tomentose, both usually somewhat glabrescent, but upper surface most, veins somewhat raised and reticulated; petiole 1.5–14 cm. long, bearing a gland on each side of the insertion of the blade. *Peduncles* 1– to few-flowered, usually under 3 cm. long; bracteoles linear-oblong to oblong or oblanceolate, 14–20 mm. long, brownish, almost membranous, tomentose outside; pedicels short. *Sepals* elliptic, chartaceous, very obtuse, equal, 12–16 mm. long. *Corolla* funnel-shaped, described as purple or rosy-purple (probably mauve), glabrous, 6–10 cm. long and the limb 5–7 cm. in diam. *Capsule* usually oblong-ovoid or ellipsoid, 20–25 mm. long, 10–15 mm. in diam., rarely globose, glabrous; valves coriaceous. *Seeds* brown, 6–8 mm. long, densely covered with long white or sometimes fulvous cottony hairs, giving the dehisced fruit the appearance of an open cotton boll.

South West Africa, Angola, Bechuanaland, Southern Rhodesia and Northern Rhodesia.

Recorded from S.W. Africa in many localities in the northern part as far south as Okahandja; in Bechuanaland, one record from N'gamiland.

A constant character is the white persistent tomentum on the lower surface of the leaves, the young ones having in addition a raised tomentum on the main veins. The closely related *I. albivenia* has glabrescent leaves and the calyx is usually not so completely tomentose as in *I. verbascoidea*.

The capsules of *I. verbascoidea* are usually not globose (as stated in Fl. Trop. Afr.), but oblong-ovoid, up to 2.5 cm. long and 1–1.5 cm. in diam. The seeds bear long woolly hairs which are white or sometimes fulvous.

The differences between *I. verbascoidea* and *I. dammarana* (of which I saw an isotype, Rand 273, in GRA, and a photograph of the type in PRE) do not hold and these two names are clearly synonymous. Several other described species (such as *I. grantii* Oliv.) are very close and may eventually prove to be synonyms. In any case the name *I. verbascoidea* is the oldest and must be maintained at least for the specimens occurring in Angola and South West Africa.

Ipomoea conceiroi Rendle, based on Gossweiler 2443 (flowers) and 4703 (fruits) is not distinct. The types are represented by duplicates in COI and by photographs

in PRE and these specimens fall within the range of variation of *I. verbascoidea*. The differences mentioned by Rendle (leaf-shape and ovoid, instead of subglobose, capsules break down altogether).

Ipomoea seineri (type destroyed) is reduced here to *I. verbascoidea*, because the description agrees very well. Dinter (l.c.) also suggested this identity.

46. *I. shirambensis* Baker in Kew Bull. 1894, p. 72; Hallier f. in Engl. Bot. Jb. 28 (1899), p. 49 (“*schirambensis*”); Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 186; Brenan in Mem. New York Bot. Garden 9 (1954), p. 8.

Type: Kirk 93 from Shiramba, Lower Zambesi in herb. Kew.

Tall perennial woody climber. *Stems* glabrous or sometimes pubescent when young, glabrous, firm and woody with greyish or yellowish bark and raised longitudinal ridges when old. *Leaves* deciduous, ovate to orbicular, entire, long-acuminate, cordate to truncate at the base, up to 9 cm. long and 7 cm. wide, densely pubescent to glabrous; petioles shorter than the blades, slender. Flowers appearing before the leaves on the naked branches, solitary or in 2–14-flowered congested, fascicle-like cymes; peduncles and cyme-branches very short; bracts minute; pedicels thickening upwards from a slender base, 10–25 cm. long. *Sepals* coriaceous, much imbricate, ovate, mucronate, 9–15 mm. long, outer ones usually the shortest, glabrous. *Corolla* funnel-shaped, white or pale mauve with mauve centre, 3.5–6 cm. long and the limb as much in diam., glabrous, midpetaline areas conspicuous. *Capsule* ovoid, glabrous, 15–17 mm. long and about 11 mm. in diam. *Seeds* about 6 mm. long, with very long spreading fulvous cottony hairs.

From the northern part of Portuguese East Africa westwards; apparently common in the western part of Southern Rhodesia and northern Bechuanaland, extends into Northern Rhodesia, Nyassaland, Tanganyika, Belgian Congo, Transvaal and probably Eastern Angola.

TRANSVAAL.—Zoutpansberg, 2 miles N.E. of Punda Maria: Codd & Dyer 4560 (PRE); Punda Maria: v. d. Schijff 970, 3025, 3189 (PRE).

BECHUANALAND.—Chobe: Miller B/1088 (PRE); Robertson & Elffers 91 (PRE, SRGH), N’gamiland: Curson 908 (PRE); nr. Ngoma: Codd 7581 (PRE); without precise locality: Pole-Evans 4603 (PRE).

MOÇAMBIQUE.—Sena: Lea 22 (PRE); Baroma, Sisitso: Chase 2648 (SRGH); Manica e Sofala, between Muatize and Tete: Barbosa & Carvalho 3249 (PRE); Mocuba: Faulkner “Kew 79” (COI); Niassa, Meconta: Torre 883 (COI); Nampula: Torre 657 (COI).

One Transvaal specimen was compared with the type by Miss Kies at Kew and was reported to be a good match of Kirk 93, and some other specimens (e.g., Pole Evans 4603) were named at Kew by Mr. de Winter.

47. *I. adenioides* Schinz in Verhandl. Bot. Ver. Brandenb. 30 (29th Sept. 1888), p. 270; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 51; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 195. *I. marlothii* Engl. in Engl. Bot. Jb. 10 (9th Oct. 1888), p. 244; *Rivea adenioides* (Schinz) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 156.

Type: Not designated, because Schinz mentioned three specimens (not seen). However, the species is so characteristic that it can easily be recognised from the description and I have seen specimens referred to this species by Hallier. The type of *I. marlothii* Engl., reduced to its synonymy by Hallier (*Marloth* 1250) is represented by an isotype in PRE.

Erect shrub up to about 1·20 m. high. *Young branches* covered with very short silky hairs, older ones glabrous, greyish or yellowish, canescent. *Leaves* at the ends of the young branches firm to subcoriaceous, varying from lanceolate or oblanceolate to elliptic, obovate to obovate-orbicular, usually cuneate at the base, obtuse to acute, often with a densely white-hairy mucro, entire, penninerved, 3–8 cm. long and 1–5 cm. wide; green, glabrescent above, densely silky beneath mainly on the veins, ultimately glabrescent; margin densely and shortly ciliate when viewed from upper surface; petioles much shorter than the leaves, sometimes very short, shortly silky-pubescent. *Peduncles* 1-flowered, short, densely silky-pubescent as are bracteoles, pedicels and calyx; bracteoles linear to linear-lanceolate, acute, 8–18 mm. long; pedicels very short. *Sepals* subequal, lanceolate, long-acute or acuminate, 15–18 mm. long, in fruit accrescent, up to 28 mm. long. *Corolla* hypocrateriform; tube narrowly cylindrical, 7–10 cm. long, greenish white outside, deep magenta inside, adpressed silky outside, glabrous inside; limb spreading, white, 4·5–6 cm. in diam., silky on the midpetaline areas outside. *Capsule* ovoid, thinly hairy to glabrous, 19–23 mm. long and 14–18 mm. in diam., valves coriaceous. *Seeds* about 1 cm. long, densely covered with very long, shiny, fulvous-brown hairs.

South West Africa, Bechuanaland, Transvaal, extending into the western part of Southern Rhodesia and possibly into Angola, also recorded from Somaliland.

Recorded from S.W. Africa (practically the whole area in sandveld where there are no real deserts, as far south as the Great Karasberg; apparently common in many places); Bechuanaland (N'gamiland); Transvaal: Zoutpansberg, Pietersburg, Lydenburg (one record only), Potgietersrust, Waterberg and Pretoria districts; S. Rhodesia: Wankie.

Hallier referred this plant to *Rivea* sect. *Poliothamnus*, but as is pointed out under *Turbina*, this section has to be referred to the genus *Turbina* Rafin. However, *Ipomoea adenioides* has dehiscent 4-valved capsules and long-pubescent seeds and belongs, therefore, in *Ipomoea* sect. *Eriosperrum*.

The flowers of *I. adenioides* are open only during the late afternoon and evening.

Excluded species of *Ipomoea*:—

Ipomoea angustifolia Jacq. = *Merremia tridentata* (L.) Hall. f. subsp. *angustifolia* (Jacq.) Ooststr.

I. argyreoides Choisy = *Turbina oenotheroides* (Linn. f.) A. Meeuse.

I. barrettii Rendle = *Turbina oenotheroides*.

I. bowieana (Rendle) Baker (= *Merremia bowieana* Rendle) = *Convolvulus capensis* Burm. f. ssp. *bowieanus* (Rendle) A. Meeuse.

I. curtoi Rendle = *Turbina curtoi* (Rendle) A. Meeuse.

I. holubii Baker = *Turbina holubii* (Baker) A. Meeuse.

I. lambtoniana Rendle = *Turbina oblongata* (E. Mey. ex Choisy) A. Meeuse.

I. malvaefolia (Rendle) Baker = *Merremia malvaefolia* Rendle.

I. oblongata E. Mey. ex Choisy = *Turbina oblongata* (E. Mey. ex Choisy) A. Meeuse.

I. oenotheroides (L.) Rafin. ex Hall. f. = *Turbina oenotheroides*.

I. pyramidalis Hall. f. = *Turbina pyramidalis* (Hall. f.) A. Meeuse.

I. quinquefolia Hochst. ex Hall. f., non L., quoad var. *pubescens* Baker = *Merremia verecunda* Rendle.

- I. rhodesiana* Rendle = *Turbina holubii*.
I. robertsiana Rendle = *Turbina robertsiana* (Rendle) A. Meeuse.
I. saundersiana Baker = *Operculina turpethum* (L.) S. Manso.
I. shirensis Oliv. = *Turbina shirensis* (Oliv.) A. Meeuse.
I. stenosphon Hall. f. = *Turbina stenosphon* (Hall. f.) A. Meeuse.
I. sublucens Rendle = *Turbina suffruticosa* (Burch.) A. Meeuse.
I. suffruticosa Burch. = *Turbina suffruticosa* (Burch.) A. Meeuse.
I. tetraptera Baker = *Merremia pterygocaulos* [(Steud. ex) Choisy] Hall. f.
I. uncinata Hutch. = *Turbina robertsiana*.
I. woodii N. E. Br. = *Stictocardia woodii* (N. E. Br.) Hall. f.

Doubtful record:—

Ipomoea stolonifera (Cyrill.) J. F. Gmel., Syst. Nat. Ed. 13, 2 (1791), p. 345. Thunberg described his *Convolvulus radicans* from a specimen which he reported to be collected in South Africa. In Fl. Capensis 4, 2, p. 52, this species is included as *I. carnosa* R. Br., but the only specimen quoted is Thunberg's specimen (the type of *C. radicans*).

Ipomoea stolonifera has never been collected in S. Africa again and most probably Thunberg's locality is erroneous. The nearest locality I know is Angola, so that this species is not included here.

15. STICTOCARDIA

Hall. f. in Engl. Bot. Jb. 18 (1893), p. 159; Hutch. and Dalz., Fl. W. Trop. Afr. 4 (1931), p. 218; Van Ooststr. in Blumea 5 (1943), p. 346, and in Van Steen., Fl. Males. Ser. I, 4·4 (1943), p. 491. *Argyreia* Sect. *Pomifera* C. B. Clarke in Hook. f., Fl. Br. Ind. 4 (1883), p. 184. *Argyreia* Baker and Rendle in Dyer, Fl. Trop. Afr., 4, 2 (1906), p. 200, type excluded. *Ipomoea* Auct., pro parte.

Type species: *Convolvulus tiliifolius* Desr. = *Stictocardia tiliifolia* (Desr.) Hall. f. (first species mentioned by Hallier and also the oldest species described).

Herbaceous or woody perennial twiners. *Leaves* entire, ovate to orbicular, usually rather large to large, almost invariably cordate at the base and with numerous minute glands on lower surface (appearing as black dots in dried specimens). *Flowers* axillary, pedunculate, solitary or in few- to many-flowered cymes; bracts small, deciduous. *Sepals* elliptic to orbicular, obtuse or rounded to emarginate, equal or subequal, often much imbricate, subcoriaceous, frequently with thinner margins, much accrescent in fruit. *Corolla* large, funnel-shaped with shallowly-lobed to subentire limb, usually purple, magenta or reddish; the midpetaline areas often somewhat hairy and with minute glands like the leaves. *Stamens* inserted near the base of the corolla-tube; pollen globose, spinulose. *Disc* annular, entire or somewhat 5-lobed. *Ovary* 4-celled, 4-ovuled, glabrous: style 1, filiform; stigma biglobular. *Fruit* completely enclosed by the accrescent calyx, globose; its dissipiments with 2 transverse wings at the surface of the fruits, woody; the wall between these wings thin, detaching irregularly from the dissipiments and their wings so that 4 openings are formed and the fruit becomes lantern-shaped. *Seeds* ultimately exposed by the 4 openings in the fruit, dark brown or black, pubescent.

6-7 (possibly more) species; one circumtropical, a few in Africa and a few in Asia and Malaysia.

This genus is very similar to *Ipomoea* in its vegetative and floral characters, but is quite distinct by its typical fruit and by the black dots (glands) on the lower leaf surface. The genus *Stictocardia* is very homogeneous and the species are very similar. One species in S. Africa.

Stictocardia woodii (N. E. Br.) Hall. f. in Bull. Herb. Boiss. 6 (1898), p. 548. *Ipomoea woodii* N. E. Br. in Kew Bull. 1894, p. 101; Baker and Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 60; Wood, Natal Pl. 6 (1912), t. 557.

Type: *Wood* 4146 and *Wood* 4864 are quoted by N. E. Brown. Both were taken from the same cultivated specimen in the Durban Botanical Garden, as were *Wood* 4806, 10065, 11579, 13064. They are for practical purposes all "type specimens".

Perennial with a large tuberous rootstock (Wood). *Stems* stout, the older portions lying on the ground and reaching a length of 7 m. or more, the younger portions creeping or climbing, finely pubescent, glabrescent. *Leaves* orbicular-cordate with broad, shallow basal sinus, up to 25 cm. long and wide, thinly hairy to quite glabrous, the apex obtuse to acuminate, minutely emarginate and mucronate: petiole 5-15 cm. long, stout, channelled above. *Inflorescences* cymosely 3-8-flowered or in upper portions of the stems 1-3-flowered; common peduncle 2-6 cm. long, stout; pedicels up to about 3 cm. long; bracteoles early deciduous, minute. *Calyx* somewhat inflated, glabrous; sepals subequal, strongly imbricate, concave, coriaceous, ovate-oblong, obtuse or rounded at the apex, the outer ones slightly larger than the inner ones. *Corolla* funnel-shaped, rosy-pink (Wood) but also reported to be yellow according to Hallier, 6.5-8 cm. long, the limb as much in diam., spreading, shallowly 5-lobed, the lobes rounded to emarginate; midpetaline areas very distinct, quite glabrous or bearded at the apex. *Stamens* somewhat unequal, included, shorter than the style. *Capsule* unknown.

Zululand and S. part of Portuguese East Africa, in lowland forests.

ZULULAND.—Ngoye: *Wood* 10354 (NH).

PORTUGUESE E. AFRICA.—Lourenço Marques (Delagoa Bay): *Junod*, according to Hallier (1898).

CULTIVATED SPECIMENS.—In Durban Bct. Garden, originally from Zululand: *Wood* 4146 (NH), 4806 (PRE, SAM), 10065, 11579, 13064 (NH).

This species is not quite identical with the four species mentioned in Fl. Trop. Afr. under *Argyreia* and Hallier stated that it is distinct from all the other African species he distinguished. It differs, among other things, from the other species in its glabrous calyx. Only a monographer of this difficult genus will be able to decide if *S. woodii* is to be upheld or not. For the time being it is treated as a separate taxon.

16. TURBINA

Rafin., Fl. Tellur. 4, 1836 (1838), p. 81; Ooststr. in Steen., Fl. Males. Ser. I, 4.4 (1953), p. 493. *Legendrea* Webb. et Berth., Hist. Nat. Iles Canar., Bot. 3, 2 (1844), p. 26, t. 137; Choisy in DC., Prodr. 9 (1845), p. 328; Van Ooststr. in Blumea 5 (1943), p. 355. *Rivea* Choisy emend. Hall. f. in Engl. Bot. Jb. 18 (1893), p. 155, pro parte, non *Rivea* Choisy 1833, nec *Rivea* Hall. f. in Engl. Bot. Jb. 16 (1893), p. 584. *Ipomoea* Auct. plur., pro parte.

Type species: *Convolvulus corymbosus* L. = *Turbina corymbosa* (L.) Rafin.

Amended generic description: Mostly woody or suffruticose, decumbent or ascending to scandent, rarely erect, almost invariably more or less pubescent or tomentose perennials, sometimes with large fusiform tuberous rootstock. *Leaves* often subcordate or cordate. *Flowers* solitary or in (sometimes subumbellate) cymes, or compound cymes arranged in a terminal panicle. Floral characters generally as in *Ipomoea*. *Sepals* equal or sometimes unequal, lanceolate to oblong or occasionally orbicular, in fruit usually slightly enlarged and more or less spreading or loosely enclosing the capsule. *Corolla* funnel-shaped, rarely hypocrateriform. *Pollen* spinulose. *Fruit* indehiscent, with hard, more or less woody or thin and leathery pericarp, usually apiculate by the persistent style-base, often only 1- or 2-seeded. *Seeds* often puberulous.

According to Van Oostroom (1953), there are at least two species in America, one of which (*T. corymbosa*) has been introduced in the Old World and occasionally become naturalized, but he expects that there are probably more species under *Ipomoea*. There are indeed at least eight species, found in Southern and Central Africa, which were described under *Ipomoea* and have to be transferred to this genus.

Van Oostroom discussed the delimitations of the genera *Argyreia* Lour., *Rivea* Choisy s.s. and *Turbina* (as *Legendrea*) in *Blumea* 5 (1943), p. 353-355. For details the reader is referred to this discussion. The essential points are:—

- (a) that Hallier (1893) extended the generic limits of *Rivea* Choisy (1833) to include many species which are partly referable to *Ipomoea* sect. *Eriospermum*, partly to *Argyreia*, partly to *Turbina*;
- (b) that the genus *Rivea* has to be brought back to its original limits as indicated by Choisy in 1833 [not as treated in DC., *Prodr.* 9 (1845)] and by Hallier in *Engl. Jb.* 16, p. 559-560, 504, and comprises two South-East Asian species only;
- (c) that *Turbina* (= *Legendrea*) had to be given generic rank again. The African representatives of Hallier's genus *Rivea* in its wider sense were suggested to belong to *Turbina* or to distinct genera closely related to *Turbina* (if not referable to *Ipomoea* sect. *Eriospermum*).

The inclusion of at least eight African species necessitates some amendments in the generic description of *Turbina*. This is not surprising because the larger the genus, the greater usually the variation in characters. The species described as *Ipomoea shirensis* Oliv. is very similar to the type species *Turbina corymbosa* and undoubtedly belongs in the same genus. The species *Ipomoea pyramidalis* Hall. and *I. curtoi* Rendle are obviously closely related to *Turbina shirensis*. There are also distinct relationships between *T. pyramidalis*, *T. shirensis* and *T. holubii*. *T. holubii* and *T. pyramidalis* are both erect or suberect, so that species of *Turbina* need not always be climbing shrubs. The last two species link up with *Ipomoea suffruticosa*, but the latter has a long-apiculate fruit. *Ipomoea robertsiana* is closely related to *T. suffruticosa*. Finally, the last-mentioned species is again closely related to *I. oenotheroides*, which is an erect shrub with narrow linear leaves, and to *Ipomoea oblongata*, a prostrate perennial. I cannot find any distinct discontinuity which would exclude any of these species, but they are all sharply distinguished from *Ipomoea* by their indehiscent fruits. It is true that as far as I know the fruit and seed of *I. pyramidalis* and *I. curtoi* have not yet been found, but these species are so similar to *T. shirensis* and *T. holubii* that they must belong to the same genus. The species described as *Ipomoea stenosphon* (= *Rivea stenosphon*) differs in its hypocrateriform corolla, but this cannot be a sufficient reason to separate it from the other ones included here in *Turbina* because in the related genus *Ipomoea* both funnel-shaped and hypocrateriform corollas occur. The vaguer generic characters make the distinction between *Turbina* and *Argyreia* less easy, although the consistency of the pericarp (pulpy, fleshy or thick and leathery in *Argyreia*, hard and woody or thin and leathery in *Turbina*), apart from the geographical separation, seems to be a satisfactory distinguishing character.

Erect, much branched shrub, usually shortly silvery-tomentose, rarely strigose; leaves linear or oblanceolate, sessile or occasionally shortly petiolate, narrowed at the base; flowers solitary on very short peduncles, rarely peduncles longer and/or 2-flowered; sepals lanceolate; seeds glabrous 1. *T. oenotheroides*.

Prostrate or climbing plants, or, if suberect to erect, leaves usually distinctly petiolate, rounded or subcordate at the base, or plant not silvery pubescent:

Flowers solitary or 2 together; sepals equal or sub-equal, lanceolate or ovate-lanceolate to oblong; prostrate to suberect plants, corolla funnel-shaped:

Vegetative parts (except upper surface of older leaves), peduncles and calyces densely and shortly silvery-tomentose, sometimes whitish-silky; leaves generally elliptic-oblong not distinctly recurved-mucronate at the apex (Griqualand West, Bechuanaland, S.W. Africa)..... 2. *T. suffruticosa*.

Vegetative parts, peduncles and calyces, variously hairy but not densely and shortly silvery-tomentose:

Leaves up to 35 mm. long, quite glabrous above, often with crisped margin, frequently with recurved mucronate apex, on the lower surface covered like the stems, peduncles and calyces with rather stiff, white, more or less spreading hairs; peduncles slender; seeds shortly velutinous (Transvaal)..... 3. *T. robertsiana*.

Leaves often much longer, usually more or less hairy above; pubescence on leaves and other parts usually yellowish or brownish, seeds glabrous (wide-spread)..... 4. *T. oblongata*.

Flowers either in cymes or panicles, or, if solitary, sepals distinctly unequal, obtuse, rounded or emarginate, or plants erect or climbing:

Corolla funnel-shaped, pale mauve with magenta centre; sepals broad, suborbicular, unequal, hairy, flowers solitary or in few-flowered cymes; erect to spreading much branched shrub (tips of twigs sometimes sinuous or twining)..... 5. *T. holubii*.

Corolla white or cream-coloured; sepals oblong or elliptic; flowers solitary (sometimes peduncles fascicled) or in panicles:

Corolla funnel-shaped, 2-3 cm. long; sepals equal, at first tomentose, later spreading and ultimately denuded; inflorescence a lax panicle with cymose branches, fruit subglobose, tomentose, not distinctly apiculate..... 6. *T. shirensis*.

Corolla hypocrateriform, its tube 7-13 cm. long; sepals unequal, the outer ones shorter, coriaceous, glabrous, much accrescent and loosely enclosing the glabrous ovoid distinctly apiculate fruit..... 7. *T. stenosphon*.

1. *Turbina oenotheroides* (Linn. f.) A. Meeuse, comb. nov. *Convolvulus oenotheroides* Linn. f., Suppl. (1781), p. 137. *Ipomoea oenotheroides* (Linn. f.) Rafin. [Fl. Tellur. 4 (1838), p. 74] ex Hall. f. in Engl. Bot. Jb. 18 (1893), p. 156, in syn. *I. cana* E. Mey. ex Drège, Zw. Pfl. geog. Doc. (1843), p. 45, 54, 195, nomen tantum. *I. argyreoides* Choisy in DC., Prodr. 9 (1845), p. 357; Rendle in J. Bot. 40 (1902), p. 191; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 49. *Rivea oenotheroides* (Linn. f.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 156. *Ipomoea barrettii* Rendle op. cit., p. 190; Baker & Wright, op. cit., p. 50.

Type: A specimen leg. *Sparrman* (according to Linn. f.), but no type specimen could be located in the Linnean Herbarium or in the Stockholm herbarium.* The identification of *Convolvulus oenotheroides* with *I. argyreoides* Choisy has been done by Hallier and he was followed in Fl. Cap. The description given by the younger Linnaeus

* Note during correction: Quite recently the Stockholm herbarium sent authentic specimens (leg. *Sparrman*). They agree with the type of *Ipomoea argyreoides*.

in his *Supplementum Plantarum* agrees very well with the type of *I. argyreoides*, except that the calyx is described as glabrous. However, the calyx is called "canis" and this obviously refers to the often very short canescent pubescence on the outer sepals. In addition there is a specimen in the Thunberg herbarium, which, was labelled "*Convolvulus oenotheroides*" by Thunberg and Thunberg must have obtained his identification from Linnaeus the younger. This specimen was examined by Hallier and by N. E. Brown who were both satisfied that it is the same as *Ipomoea argyreoides* Choisy. There is a note in the Kew Herbarium on a specimen Zeyher 1206 which says "Matches *Convolvulus oenotheroides* of Thunberg Herbarium". The identity of *Convolvulus oenotheroides*, therefore, seems to be definitely established.

Erect, suffruticose to shrubby perennial, 30–100 cm. high, usually much branched and forming a dense bush, with slender fusiform tuberous roots up to 1.25 m. long. *Stems* stout and woody at the base, covered, like the young parts, petioles, lower surface of leaves, peduncles, bracteoles, pedicels and calyces with a very short silvery adpressed pubescence (which is very rarely strigose consisting of somewhat longer, not silvery hairs), only glabrescent in the very old parts, subterete to somewhat angular, solid; ultimate twigs slender, often angular, sometimes virgate, sometimes sinuous. *Leaves* entire, usually linear to oblanceolate or lanceolate, 3–6 (–11) cm. long and 2–8 (–30) mm. wide; the base usually decurrent into the short (0–6 mm.), occasionally up to 18 mm. long) petiole; the apex acute or obtuse, mucronate. *Peduncles* 1-flowered, usually very short, under 15 mm. long, but occasionally up to 7 cm., rather slender, subterete or angular; bracteoles small, narrow, rather stiff, pedicels always short, under 1 cm. long. *Sepals* subequal, or the outer ones a little shorter, lanceolate, acute or subacute, 8–16 (–25) mm. long. *Corolla* bright magenta or magenta-pink, funnel-shaped, 3.5–7 cm. long and as much or more in diam., midpetaline areas densely covered with short adpressed silvery hairs, rarely very sparsely so. *Capsule* ovoid or ovoid-globose, abruptly apiculate and the acumen again crowned by the persistent style-base, dark-brown, glabrous, 15–20 mm. long and 10–15 mm. in diam., 1–3-seeded, pericarp leathery. *Seeds* dark brown to black, glabrous, very minutely areolate to almost smooth, about 9 mm. long.

Recorded from the following districts: *South West Africa* (Auas Mts., Lichtenstein, Kuisib Riv., Haris); *Cape* (Kenhardt, Phillipstown, De Aar, Kimberley, Graaff-Reinet, Somerset East, Cradock, Middelburg, Colesberg, Albert, Queenstown, Cathcart, Albany, Stockenström, Ft. Beaufort, Victoria East); *Orange Free State* (Fauresmith, Bloemfontein, Senekal, Heilbron, Vredfort, Kroonstad); *Natal* (Klip Rivier, Estcourt, Weenen); *Transvaal* (Bloemhof, Wolmaransstad, Klerksdorp, Potchefstroom, Vereninging, Heidelberg, Lichtenburg).

The type of *I. barrettii* Rendle was examined by Mr. de Winter who reported that it is very similar to specimens named *Ipomoea argyreoides* Choisy. There is a photograph of the type in PRE and I am of the opinion that it is indeed only a depauperate form of *Turbina oenotheroides*. The reduction of *I. barrettii* to the latter species had already been done by Hallier in Meded. Rijksherbarium Leiden no. 1 (1910), p. 25.

2. *Turbina suffruticosa* (Burch.) A. Meeuse, comb. nov. *Ipomoea suffruticosa* Burch., Trav. S. Afr. 2 (1824), p. 226; Choisy in DC., Prodr. 9 (1845), p. 357, exclus. syn.; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 51. *I. contorta* Engl. in Engl. Bot. Jb. 10 (1888), p. 244, non Choisy (1845). *Rivea suffruticosa* (Burch.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 156. *Ipomoea sublucens* Rendle in J. Bot. 39 (1901), p. 17; Baker & Wright, op. cit., p. 57.

Type: *Burchell* 1838 in herb. Kew.

Perennial with thick fusiform taproot. *Stems* several, suffruticose, prostrate to suberect, slender to stout, up to about 1 m. long; clothed with a fine silvery subtomentose pubescence which is also present on all young parts, petioles, peduncles, pedicels and calyces but is often sparser on the leaves. *Leaves* elliptic-oblong, ovate or lanceolate-oblong, rather acute with usually recurved mucronate apex to obtuse or slightly retuse, more or less densely hairy beneath, less densely to glabrescent and somewhat verrucose above, rounded to truncate or subcordate, rarely cuneate, at the base, 2–5 (–7) cm. long and 0.4–3 (–5) cm. wide; petioles from about 4 mm. up to 15 mm. long. *Peduncles* 1–5 cm. long, 1- or rarely 2-flowered, more or less distinctly widened and articulated against the short, 2–10 mm. long pedicel; bracteoles lanceolate, oblong-lanceolate or more or less oblanceolate, densely hairy on the outer surface, much less hairy on inner surface, more or less distinctly ciliate, usually acute and usually distinctly narrowed (subpetioled) at the base, 8–15 mm. long, 1–3 mm. wide. *Sepals* subequal, lanceolate or oblong, acuminate, acute, 14–17 mm. long, 4–8 mm. wide; the inner ones sometimes slightly shorter and less acute. *Corolla* funnel-shaped, described as rosy-purple (probably a bright magenta), 4–5 cm. long and as much or a little more in diam.; midpetaline areas with rather short adpressed hairs. *Fruit* globose or ovoid-ellipsoid, dark brown, glabrous, about 10 mm. long and 7–10 mm. in diam., abruptly apiculate and crowned by the persistent stylebase, (always?) 1-seeded. *Seed* minutely puberulous.

S. W. AFRICA.—Windhoek, N. outcrops of Auas Mts.: *Dinter* 1873 (SAM); 20 m. SSE of Windhoek: *de Winter* 2561 (PRE); Lichtenstein: *Dinter* 4307 (SAM).

CAPE PROVINCE.—Kuruman: *Le Grange* 15 (PRE). Hay, Postmasburg, Wildealsput: *Aucamp* h. no. 496 (KMG, also BOL, PRE); Hay: *Power* h. no. 7403 (KMG, also BOL, PRE). Vryburg, Armoedsvlakte: *Sharpe* h. no. 7389 (PRE). Barkly-W.: *Wilman* A59 (GRA); Boetsap: *Wilman* s.n. (BOL); Marloth 978 (PRE, GRA); Koopmansfontein: *Acocks* 17855 (PRE).

BECHUANALAND: *Bryant* s.n. (BOL).

This species sometimes resembles *T. oenotheroides* very much, because in some specimens the leaves are narrowed to the base (e.g. in the specimens *Power* s.n. and *Aucamp* s.n.). There can be no doubt, however, that the two species are quite distinct, because the leaves are always distinctly petioled in *T. suffruticosa*, and, in addition, the stems are usually prostrate and unbranched (erect, much branched in *I. oenotheroides*).

I have not seen the type, but the specimen *Marloth* 978, referred to this species by Hallier and in Fl. Cap., was taken to be representative.

3. *Turbina robertsiana* (*Rendle*) *A. Meeuse*, comb. nov. *Ipomoea robertsiana* Rendle in Jl. Bot. 39 (1901), p. 18; Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 50. *I. uncinata* Hutch., Botan. in South Afr. (1946), p. 337.

Type: *Greenstock* s.n. from Pilgrim's Rest, Transvaal, in BM.

Perennial, forming several to many prostrate, suffruticose stems from a more or less cylindrical or fusiform, 1–5 cm. thick rootstock. *Stems* either simple or with many short axillary branches, up to 120 cm. long, terete or conspicuously angular, solid, sparsely covered with rather stiff, white, more or less spreading hairs (the same pubescence is found on the petioles, lower surface and margins of the leaves, peduncles, bracts, pedicels and sepals). *Leaves* linear-lanceolate to ovate-lanceolate or ovate-oblong, 10–35 mm. long and 3–18 mm. wide, often with crisped margin and folded on the midrib, frequently with recurved, mucronate apex, narrowed to rounded at the base, quite glabrous above; petioles 1–8 mm., rarely up to 13 mm. long. *Peduncles* 1-flowered, slender, 5–30 (–40) mm. long, terete; bracts narrowly linear to almost

setaceous, 4–20 mm. long; pedicels very short to at most 3 mm. long. *Sepals* ovate-lanceolate to linear-lanceolate, acute to acuminate to aristate, 13–21 mm. long, subequal. *Corolla* funnel-shaped, magenta, 5–7 cm. long, usually sparsely hairy on the midpetaline areas, more rarely quite glabrous. *Fruit* laxly enclosed by the glabrescent, subcoriaceous, hardly accrescent sepals, subglobose, indehiscent, finely longitudinally striate, abruptly apiculate and often the apiculus again apiculate by the persistent style-base, glabrous, about 10 mm. long without the apiculus and about 10 mm. in diam., 1- or 2-celled and 1- or 2-seeded; pericarp leathery. *Seed* about 6 mm. long, densely and shortly velutinous with greyish-brown hairs.

TRANSVAAL.—Waterberg, Naboomspruit: *Galpin* M230 (PRE); nr. Naboomspruit: *Meeuse* 9448 (PRE); nr. Hermanusdoorns: *Codd* 8502 (PRE). Potgietersrust, Potgietersrust: *Leendertz* h. no. 6611 (PRE); *Eliovson* h. no. 27002 (J. PRE); S.E. of Moorddrift: *Meeuse* 9463 (PRE). Pietersburg, near Pietersburg: *Bolus* 10924 (BOL); *Hutchinson* 2285 (BOL, isotype of *Ipomoea uncinata* Hutch.); *Smuts* s.n. (PRE); *Bruce & Kies* 46 (PRE); *v.d. Merwe* 2283 (PRE); *Meeuse* 9154 (PRE); *Codd* 7932 (PRE); between Bandolierskop and Zoekmakaar: *Meeuse* 9154 a (PRE). Lydenburg, Sekukuni-land: *Barnard* 327 (PRE). Pilgrimsrest: *Greenstock* s.n. (fide Rendle and Fl. Cap.). Barberton: *Rogers* 14032 (GRA, PRE).

Mr. de Winter compared several specimens with the type of *Ipomoea robertsiana* Rendle (viz. *Galpin* M 230, *v.d. Merwe* 2283) and reported that they agree very well, except that the leaves are wider than in the type. *Leendertz* H. no. 6611 agrees with *Galpin* M 230, but has narrower leaves and must, therefore, be very similar to the type. However, *v.d. Merwe* 2283, which has wider leaves, is not essentially different from the isotype of *I. uncinata* (*Hutchinson* 2285). All the specimens cited above form a continuous series, from narrow-leaved ones to broader-leaved ones.

There are some variations in the characters of *T. robertsiana*, so that the descriptions given by Rendle and by Hutchinson do not fit the more extreme specimens. For example, the corolla was described by both authors as glabrous, whereas actually the corolla is almost invariably thinly hairy on the midpetaline areas, especially when still in bud. Even the flowers of Hutchinson's own type are hairy on the midpetaline areas in bud. The stems are not always unbranched as indicated by Hutchinson and not always terete as stated by Rendle, etc.

T. robertsiana is very similar in appearance to some forms of *Turbina oblongata*. *T. robertsiana* can be distinguished by a number of minor characters, such as white pubescence (often yellowish in *T. oblongata*), glabrous upper leaf surface, smaller, more herbaceous, often subuncinate and crisped leaves, more slender peduncles and velutinous seeds (glabrous in *T. oblongata*). It is also very similar to *Ipomoea crispa*, but the latter is hairy on the upper surface of the leaves and is, in addition, geographically, separated.

4. *Turbina oblongata* (E. Mey. ex Choisy) A. Meeuse, comb. nov. *Ipomoea oblongata* E. Mey. ex Choisy in DC., Prodr. 9 (1845), p. 368; Hall. f. in Engl. Bot. Jb. 18 (1893), p. 127; Rendle in J. Bot. 39 (1901), p. 16 (var. *hirsuta* Rendle); Baker & Wright in Dyer, Fl. Cap. 4, 2 (1904), p. 57. *I. oblongata* E. Mey. ex Drège, Zw. Pfl. geog. Doc. (1843), p. 46, 142, nomen tantum. *I. lambtoniana* Rendle, op. cit., p. 16; Baker & Rendle, op. cit., p. 61. *I. randii* Rendle op. cit., p. 18; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 146.

Type: Drège, "in graminosis inter Schalumna et Buffelsrivier alt. 1500 ped." (Choisy), i.e., King William's Town or East London distr. (in herb. Geneva). I have not seen the type or any isotypes, but I have studied several specimens referred to *I. oblongata* by Hallier and in Fl. Cap. In addition, there is only one species of *Ipomoea*

or *Turbina* found near the type locality which can be identified with this species, other, similar, ones occurring in that area (such as *Ipomoea crassipes* and *I. crispa*) being quite distinct.

Perennial, forming several to many annual prostrate or, when still young, suberect stems from a large, up to 1 m. long and 15 cm. thick fusiform tuberous root. *Stems* often suffruticose at the base, often firm, stout, angular and somewhat zig-zag, occasionally thinner, wiry and/or terete, usually, like the petioles, leaves, peduncles and calyces, thinly or occasionally densely pubescent with stiff, usually yellowish or brownish hairs, very rarely glabrous, 0.6–2 m. long. *Leaves* very variable in size and shape, usually oblong or elliptic, varying to ovate or linear, entire, with usually rounded, truncate or subcordate, occasionally broadly cuneate or cordate, obtuse or mucronate, sometimes emarginate, acute or broadly rounded apex, and usually ciliate to sometimes densely ciliate rimmed margin, 2–10 (–15) cm. long and (0.4–) 1.5–5 (–8) cm. wide; upper surface thinly covered with strigose usually yellowish hairs, lower surface as thinly or more densely so, occasionally almost sericeo-tomentose, rarely leaves quite glabrous but, if so, stems, peduncles and calyces also quite glabrous; petioles usually much shorter than the leaves but occasionally about as long. *Peduncles* usually 1-flowered, sometimes 2-flowered, rarely 3- or 4-flowered, terete, usually shorter than the leaves; bracteoles very variable but usually lanceolate, acute, hairy like the calyx, a little shorter than the sepals, sometimes broadly oblong; pedicels usually very short (and bracteoles more or less contiguous to the calyx), sometimes longer but rarely exceeding 6 mm. *Sepals* generally lanceolate to ovate-lanceolate, subequal (inner ones slightly wider) but more or less unequal in specimens with broader, oblong or ovate sepals in which the inner ones are narrower; usually acute to acuminate with very acute tips, rarely subobtusate; outer ones more or less densely covered with usually stiff yellowish hairs but in very hairy plants almost sericeo-tomentose and in thin hairy plants subglabrous, inner ones less hairy and often with membranous edges (12–) 16–22 (–25) mm. long. *Corolla* magenta, funnel-shaped, 3.5–7 cm. long and about as much in diam., midpetaline areas usually thinly covered with silky adpressed hairs, sometimes nearly, but very rarely quite glabrous, occasionally densely silky. *Fruits* only rarely produced, subglobose, glabrous, dark brown, abruptly apiculate and the apiculus again crowned by the persistent style-base, loosely enclosed by the somewhat spreading, slightly accrescent (in length and width) and coriaceous sepals, 12–15 mm. in diam., 1–4-seeded; pericarp leathery. *Seeds* glabrous, grey, finely punctate to smooth, about 7 mm. long.

From the eastern Cape to the Orange Free State and Transvaal to South West Africa, Bechuanaland, Southern Rhodesia, also in north-west Natal and Portuguese East Africa.

Recorded from: *Eastern Cape Province* (Alexandria, Albany, King William's Town, East London, Stutterheim, Cathcart, Queenstown, Kentani, Umtata, Mquanduli, McLearn, Mount Currie, Herschel, Aliwal North, Albert); *Griqualand-West* (Kimberley, Vryburg, Mafeking); *Orange Free State* (Rouxville, Bloemfontein, Winburg, Senekal, Bethlehem, Kroonstad, Heilbron); *Transvaal* (practically all districts); *Swaziland* (Mbabane); *Bechuanaland* (Kanye); *South West Africa* (Okahandja, Otjiwarongo, Otavi, Grootfontein); *Natal* (Utrecht, Pietermaritzburg); *Portuguese East Africa* (Sul do Save).

Some interesting specimens are the following: *Ecklon & Zeyher* 8·12 from Klipplaatrivier near Shiloh (Queenstown), quoted by Hallier (GRA, SAM); Shiloh: *Baur* 853 (SAM) = prob. *Baur* s.n. (in GRA, PRE), quoted in Fl. Cap.; *Zeyher* 1208 (BOL) and *Burke* 179 (SAM), both from Magaliesberg (Transvaal), isotypes of the var. *hirsuta* Rendle; *Wilms* 2152 (PRE) from Pietermaritzburg quoted under var. *hirsuta* in Fl. Cap.; *Wood* 3466 (NH), from Little Tugela River, quoted in Fl. Cap.; *Rand* 271 (GRA) from Bulawayo (isotype of *I. randii* Rendle).

Interesting extreme forms are, among other ones, the following: With subcordate to distinctly cordate leaves: *Corby* 555 (SRGH), from Marandellas, S. Rhodesia (this specimen has also leafy bracts and few-flowered inflorescences), *v.d. Merwe* s.n. from Carolina (Tvl.) in PRE (with leafy bracts and dense inflorescences); with leafy bracts: *Galpin* 14390 from Pilgrim's Rest (PRE). Subglabrous to thinly hairy forms: Barberton: *Galpin* 731 (PRE, BOL, GRA), *Codd* 7794 (PRE), *Coningham* 28 (PRE); Nelspruit: *Codd & de Winter* 5109 (PRE), *v.d. Schijff* 2406 (PRE); Witbank: *Repton* 887 (PRE); Belfast: *Smuts & Gillett* 2211 (PRE). With narrow, linear leaves: *Galpin* 731, *Repton* 887, *Smuts & Gillett* 2211. With softer, strigose-subtomentose pubescence: *Bradfield* 220; *Liebenberg* 2497 (PRE), from Belfast; *Galpin* 14390.

After having seen many specimens, I have come to the conclusion that this species has a very wide range and is extremely variable. It has, accordingly, been described several times and the extreme forms are indeed rather different in pubescence, leaf-shape, shape of petals, length of petioles and peduncles, and in the number of flowers per peduncle. However, all these various forms are united by intermediate specimens. They cannot even be grouped into distinct varieties.

Ipomoea randii, of which I saw a photograph of the type (PRE) and an isotype (in GRA) and the type of which was compared with several specimens by Mr. de Winter, is indistinguishable from specimens referable to the "var. *hirsuta*" of Fl. Cap.

On account of the considerable variation, forms of *T. oblongata* resemble several other species: those with long petioles and long peduncles resemble *I. pellita* (which has more flowers per peduncle and usually longer and strictly linear, very bristly bracts and sepals); those with several-flowered inflorescences show some resemblance to *I. atherstonei*; small-leaved forms are very much like *I. crispa* and *Turbina robertsiana* in appearance, but can always be distinguished by the characters given in the key to the species of *Ipomoea* and *Turbina* (see under *Ipomoea*).

T. oblongata, though flowering freely, rarely seems to produce ripe capsules. In the Transvaal area most flowers are eaten or damaged by beetles and the genitalia are eaten away before the fruit has had time to set. A careful search in a large area near Pretoria resulted in one mature capsule on hundreds of plants.

5. *Turbina holubii* (Baker) A. Meeuse, comb. nov. *Ipomoea holubii* Baker in Kew Bull. 1894, p. 72; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 188. *I. rhodesiana* Rendle in Jl. Bot. 39 (1901), p. 57; Baker & Rendle, op. cit., p. 188. *Rivea* (sect. *Poliiothamnus*) *holubii* (Baker) Hall. f. in Meded. Rijksherb. Leiden I (1910), p. 25. *Ipomoea awasmontana* Dinter m.s. on *Dinter* 4307 in BM.

Type: Not designated, because Baker mentions two specimens, *Holub* 572 and 969 from S. Rhodesia (herb. Kew).

Shrub, many-stemmed from the base, and much branched up to 2.50 m. high. *Stems* covered with a light grey bark, slender, sinuous, erect, decumbent or climbing at the tips. *Innovations* sericeo-tomentose; young stems more or less densely greyish-pubescent, sometimes reddish. *Leaves* deciduous, ovate-cordate to orbicular-cordate, sometimes oblong-cordate, entire, often folded along the midrib, usually with gradually deflexed, obtuse or subacute, rarely acuminate, often mucronate apex, usually widely and shallowly cordate, sometimes obtuse, truncate, or rounded, rarely subacute at the base, more or less sericeous to tomentose on both surfaces, more densely so and more silvery so beneath, sometimes fulvo-sericeous above and on the prominent, conspicuous curving lateral veins beneath, very rarely almost glabrous (*Chase* 730), 1-6 cm. long and 0.75-4 cm. wide, rarely up to 8 by 5, very rarely up to 12 by 7 cm.;

petioles rather slender, ascending, pubescent like the stem, 4–15 (–25) mm. long. *Inflorescences* 1–3 (–5)-flowered, axillary, sometimes forming a sort of leafy panicle at the ends of the branches; peduncles slender, sometimes nearly obsolete, only a few mm. long, but usually 2.5–6 (–9) cm. long, hairy like stems and petioles as are the elliptic or spatulate to linear-oblong, herbaceous, rather small (2.5–3 mm.) to foliaceous (up to 15 by 6 mm. long) bracteoles and the 8–30 mm. long pedicels; bracteoles often numerous and forming a sort of involucre at the base of the subumbellate cyme and in this case one of them much larger, occasionally resembling a leaf and up to 4 by 2 cm. *Calyx* (6–) 8–12 mm. long, usually greyish-pubescent to tomentose (at least the outer sepals), sometimes only hairy at the base and sepals conspicuously ciliate; sepals firmly herbaceous, unequal, broadly elliptic to obovate or orbicular or obovate-spathulate, much imbricate, obtuse and mucronate or apiculate, the two inner ones conspicuously larger than the outer ones, in fruit all accrescent, becoming subcoriaceous-chartaceous, glabrescent, brown, up to about 16 mm. long, ultimately spreading to almost reflexed. *Corolla* funnel-shaped, pale mauve or pinkish with magenta centre, 4–5 cm. long with a horizontally spreading limb up to about 6 cm. in diam.; midpetaline areas thinly strigose with rather long adpressed hairs outside. *Stamens* very unequal. *Ovary* glabrous. *Fruit* with thinly leathery pericarp, ellipsoid, apiculate, 8–10 mm. long, and 3–5 mm. in diam., usually 1-celled and with a single seed. *Seed* ellipsoid, pale yellowish brown or light brown, glabrous, very finely areolate, about 7 mm. long and 3 mm. in diam.

S. W. Africa, (Bechuanaland?), S. Rhodesia, N. Rhodesia; also recorded from the Waterberg and Pietersburg districts of the Transvaal.

TRANSVAAL.—Waterberg, nr. Oslo: *Codd* 4002 (PRE); nr. Ellisras: *Codd* 8492 (PRE); 15 miles N.W. of Hermanusdoorns: *Meeuse* 9654 (PRE). Pietersburg, near Ganspoort: *Codd & Dyer* 7745 (PRE, L).

S. W. AFRICA.—Otavi: *Dinter* 917 (SAM). Guchab: *Dinter* 1608 (PRE, SAM). Rehoboth-Aub: *Dinter* 2246 (SAM). near Windhoek: *de Winter* 2352 (PRE). Awas Mts.: *Boss* s.n. (PRE). Tigerschlucht: *Boss* s.n. (PRE). Grootfontein: *Schoenfelder* S56 (PRE). Nosib: *Schoenfelder* 965 (PRE).

S. RHODESIA.—Bulalima-Mangwe, Greystones: *Feiertag* s.n. (SRGH, PRE). Bulawayo: *Rand* 141 (photograph of isotypes of *Ipomoea rhodesiana* Rendle in PRE ex BM); Bulawayo and Matopos: *Rogers* 5647 (PRE, NH); *Kolbe* 4078 (BOL). Sinoia: *Hopkins* B 1473 (SRGH). Penhalonga: *Chase* 730 (SRGH). Gwaai: *Davies* 251 (SRGH), *Allen* 244 (SRGH, PRE). Fort Victoria: *Rodin* 4254 (PRE, SRGH). Salisbury: *Eyles* 3485 (BOL), 8940 (SRGH). Filabusi, Patrick's Dam: *Davies* D 20' (SRGH). Miami, K34 Expt. Farm: *Wild* 1804 (SRGH). Hillside: *Martineau* 866 (SRGH). Marandellas, Skipton: *Collins* 133 (SRGH, PRE). Umtali: *Hopkins* H. no. 7450 (SRGH). Mazoe, Umvukwe: *Wild* 3910 (SRGH, PRE). Victoria Falls, S. bank: *Rogers* 13034 (PRE, GRA); without precise locality *Brain* no. ?8914 (SRGH).

N. RHODESIA.—Livingstone: *Grant* 4504 (PRE, BOL).

There is considerable variation in the shape of the leaves (from distinctly cordate to sub-cordate or rounded, broadly ovate to orbicular, sometimes cordate-oblong), in the inflorescences (flowers solitary or in few-flowered cymes; peduncles short or long, pedicels 8–30 mm. long, bracts small, linear-oblong and about 3 mm. long or foliaceous, large, up to 30 mm. long and 20 mm. wide) and the pubescence (the plants can be densely silky, sometimes shortly tomentose, or much more glabrous and the same applies to the sepals). The variation in the leaf shape, inflorescence and bracts is often present in a single specimen, so that I do not hesitate to include *I. rhodesiana* Rendle.

Hallier, although he did not know the fruit or seed of this species, already noticed the relationships between *I. holubii*, *I. pyramidalis* and *I. suffruticosa* and placed them all in his section *Poliothamnus* of *Rivea*. The fruiting specimens I saw confirmed the relationships and that is why I also include *I. pyramidalis* in *Turbina*.

Some specimens I have seen were compared at Kew and apart from variation in the pubescence agree with the types of *I. holubii* and *I. rhodesiana*. After having seen many specimens I came to the conclusion that the pubescence is not a constant character and, therefore, include all the above-cited specimens.

6. *Turbina shirensis* (Oliv.) A. Meeuse, comb. nov. *Ipomoea shirensis* Oliv. in Hook., Ic. Plant., Ser. III, 5 (1884), p. 58, t. 1474; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 189. *Rivea* (Sect. *Legendrea*) *shirensis* (sphalm. "*shirensis*") (Oliv.) Hall. f. in Engl. Bot. Jb. 18 (1893), p. 157 and Jb. Hamburg. Wissensch. Anst. 16, Beih. 3 (1898), p. 14. *Porana subrotundifolia* de Wild., Et. Fl. Katanga I (1902-1903), p. 111, t. 5, figs. 8-18.

Type: Not designated, because Oliver mentions two specimens: *Buchanan* 262 and *Kirk* s.n. from Nyasaland (herb. Kew), but as Oliver used the name "*shirensis*" and the Buchanan specimen came from the Shire highlands, the specimen *Buchanan* 262 must be taken as the lecto-type.

"Tall, robust climbing shrub, covering bushes and small trees" (v.d. Schijff. Faulkner). *Stems* woody, terete, covered with a short lax whitish tomentum of very short adpressed hairs, more densely so when young. *Leaves* broadly cordate to orbicular-ovate or cordate-ovate, entire, obtuse to acuminate or shortly and abruptly cuspidate at the apex, often with terminal mucro, 3-14 cm long and wide; the basal sinus wide and shallow to leaf-base almost truncate, upper surface green-drying brown, thinly pubescent with short hairs above, more densely so when young, densely white or greyish shortly-tomentose or silky-tomentose beneath; petioles rather slender, 1.5-8 cm. long, densely tomentose. *Inflorescences* cymose, axillary in the axils of the upper leaves and forming a lax terminal panicle, peduncles patent or erecto-patent, rather slender, densely tomentose like the young stems and petioles, few- to many-flowered, 3-9 cm. long; bracteoles thinly papery or almost membranous, oblong-oblancheolate, oblong-obovate or somewhat narrowly oblong-spathulate, much narrowed and subpetioled at the base, 7-12 mm. long, pale yellowish brown when dry, hairy outside, glabrous inside, very early deciduous and rarely preserved; cyme-branches short, usually under 2 cm. long, pedicels usually under 1 cm. long, both densely tomentose. *Sepals* thin, almost papery, subequal, oblong or obovate-oblong, obtuse, densely sericeo-tomentose outside, 9-11 mm. long, at first erect, much imbricate, later accrescent, glabrescent and much spreading, ultimately papery, brittle, brown and often purplish outside, pale-straw-coloured inside, 13-15 mm. long. *Corolla* white (not lilac as stated in Fl. Trop. Afr.), widely funnel-shaped, 15-20 mm. long; midpetaline areas sharply defined, densely silky. *Capsule* broadly ellipsoid or somewhat obovoid, rounded-truncate to depressed at the apex, very densely greyish sericeo-tomentose, 55-71 mm. long and 5-6.5 mm. in diam., one-seeded; pericarp hard, woody. *Seed* light brown or fawnish, subglobose-4-angled, about 4 mm. long and 3.5-4 mm. in diam., very shortly velutinous or puberulous.

N. Transvaal, S. Rhodesia, Portuguese E. Africa, Nyasaland, Belgian Congo, N. Rhodesia.

TRANSVAAL.—Sebasa, Kruger National Park: *Codd* 5978, v.d. *Schijff* 586, 647 (PRE), v.d. *Schijff* & *Marais* 3723 (PRE).

PORTUGUESE EAST AFRICA.—Near Transvaal border near confluence of Limpopo, Nuanetsi and Pafuri rivers: *Smuts* 2396, s.n. (PRE). Quelimane, Mocuba, Lugela: *Faulkner* 96 (PRE); "Kew" 263 (PRE, SRGH). Niassa, Lalaua: *Torre* 1443 (COI).

S. RHODESIA.—Danga, Sabi-Lundi junction: *Chase* 2296 (SRGH). Lundi River: *Pole Evans* 4825 (PRE). Umtali: *Eyles* 8425; *Chase* 1709 (SRGH). Umvumvumwe Riv.: *Chase* 324 (SRGH). Belingwa: *Harvie* 6/51 (SRGH, PRE). Gwanda, Doddieburn Ranch: *Davison* s.n. (PRE).

NYASALAND.—Chikwakwa: *Gerstner* 7066 (PRE).

N. RHODESIA.—Without precise locality: *N.N.* in Govt. Herb. S. Rh. no. 3314 (PRE).

Some specimens (*Codd* 5978, *Faulkner* 96) were compared with the type at Kew, so that the identity of the cited specimens is definitely established.

7. ***Turbina stenosphon*** (*Hall. f.*) *A. Meeuse*, comb. nov. *Ipomoea stenosphon* *Hall. f.* in Sitz. ber. Akad. Wiss. Wien, Mathem.-Naturw. Cl., 107 (1898), Abt. I, p. 50; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 192. *Rivea stenosphon* (*Hall. f.*) *Hall. f.* in J1. Hamb. Wiss. Anstalt. 16 (1898), Beih. 3, p. 15.

Type: *Pospischil* s.n. from Taweta, foot of Kilimanjaro, Tanganyika in W (not seen).

A tall climbing or rambling shrub, up to 15 m. long (*Gerstner*). *Stems* terete, glabrous, some often sterile, slender, whip-like (as are the young sprouts); older parts of stems woody with a yellowish-grey separable bark; flowering branches usually more robust, straight and erect, densely leafy especially towards the apex and frequently with rugose bark. *Leaves* cordate, cordate-orbicular or cordate-ovate, emarginate, acute or more or less acuminate, mucronate, with a distinct and rather wide basal sinus, glabrous or more or less pubescent, mainly on the nerves beneath, entire or sometimes more or less subrepand, 3–11 cm. long and 2·5–7·5 cm. wide; lateral nerves 8–11 on either side of the flattened and (underneath) narrowly winged midrib; reticulate nervation conspicuous beneath; lower surface, at least of the majority of the leaves of each specimen, dotted with numerous black, small circular glands; petiole slender, 2–9·5 cm. long, nearly as long as the corresponding leaf, sometimes glandular on each side a little below the blade. *Peduncles* usually on very short lateral branchlets up to about 5 mm. long, very short or obsolete, 0–3 mm. long, articulated against the solitary or 2–5-fascicled pedicels, the latter terete, very slender, sulcate when dry, thickened at the base and widening into the calyx, glabrous, 2–5 cm. long; bracts very early deciduous, more or less membranous, yellowish-brown, oblong-lanceolate, 2–3 mm. long, glabrous, acute or subacute. *Calyx* subcylindric, 14–17 mm. long, glabrous, thinly coriaceous; sepals elliptic, oblong or more or less subspathulate-oblong, obtuse or emarginate, sometimes subtruncate, much imbricate, with membranous subpellucid margins; the outer ones distinctly and sometimes much shorter, all in fruit becoming much enlarged, more or less brittle and finely and distinctly nerved, the outer ones becoming about 2 cm. long and about 1·5 cm. wide, the inner ones up to about 4 cm., long and about 2 cm. wide, all laxly enveloping the fruit to somewhat spreading. *Corolla* white, cream or pale yellow to greenish-yellow, hypocrateriform; the tube very slender (8–) 10–12 (–15) cm. long and 2–4 mm. in diam., subcylindrical or very slightly widening towards the limb; the latter more or less spreading, 3–4 cm. across when fully expanded, about 2 cm. long when flattened or collapsed, with woolly hairs near the apices of the midpetaline areas outside. *Stamens* and *style* long vexerted. *Ovary* glabrous, 4-celled. *Capsule* narrowly conical, dirty brown, 2–2·5 cm. long and 0–1·5 mm. in diam., cuspidate by the thick, awn-shaped, persistent, 12–15 mm. long style-base; pericarp thin, not splitting into valves, 1 (–3)-celled by abortion; septa, if present, thinly membranous, not separating from the pericarp. *Seed(s)* oblong, 11–15 mm. long and 5–6 mm. wide, brownish, velvety, with longer ochraceous hairs around the hilum.

E. Africa, S. Rhodesia, N. Transvaal, S. W. Africa(?), Belgian Congo.

TRANSVAAL.—Zoutpansberg, Louis Trichardt: *Gerstner* 5919 (PRE); Msekwa's Poort: *Gerstner* 5897 (PRE); Wylie's Poort: *Gerstner* 5776 (PRE).

S. RHODESIA.—Matopos: *Eyles* 58 (SRGH); *Rogers* 6900 (J). Fort Usher: *Hopkins* s.n. H. no. 9903 (SRGH). Victoria: *Monro* 1037 (SRGH). Umtali: *Chase* 1373, 4286 (SRGH).

NYASALAND.—20 miles S. of Lilongwe: *Pole Evans & Erens* 612 (PRE).

TANGANYIKA.—Kymbila: *Stolz* 1422, 1426 (L). Usagara, Mlali: *Stuhlmann* 198 (L). Pangusi: *Stuhlmann* 427 (L).

BELGIAN CONGO.—Kasai Province: *Quarré* 5460 (PRE).

?S. W. AFRICA.—Kaokoveld, Gauko (Kaoko) Otavi: *Hall* 448 (NBG).

CULTIVATED SPECIMEN.—Seed collected near Matopos (leg. *Steytler*), flowered in National Botanic Gardens, Kirstenbosch, in (BOL).

Apart from the excellent description of this very characteristic species, which is sufficient for recognition, I saw duplicates of the specimens *Stuhlmann* 198 and 427, referred to this species and annotated by Hallier himself (in L).

The leaves in this species can be densely hairy to glabrous.

The specimen *P. Quarré* 5460 consists of a twig with a few ripe fruits without leaves or flowers and is possibly referable to a closely related species (*Turbina curtoi?*), but the fruiting calyx, fruit and seed agree in every respect with those of some of the other specimens, so that it is tentatively referred to *T. stenosphon*.

The specimen *Hall* 448 has very young fruits, no corollas and glabrous, somewhat coriaceous leaves. Without complete flowers it is impossible to decide if this plant represents a different species or is only an ecotype with glabrous, rather thick leaves. The calyx and young fruit are exactly as in *T. stenosphon* and that is why the plant is tentatively referred to this species.

Apart from the above-mentioned species, the following have to be transferred to *Turbina*:—

Turbina pyramidalis (*Hall. f.*) *A. Meeuse*, comb. nov. *Ipomoea pyramidalis* Hall. f. in Engl. Bot. Jb. 18 (1893), p. 152; Hiern, Cat. Welw. Afr. Pl. I, 3 (1898), p. 741; Baker & Rendle in Dyer, Fl. Trop. Afr. 4, 2 (1905), p. 193. *Ipomoea megalochlamys* Baker in Kew Bull. 1894, p. 72. *Rivea* (Sect. *Poliothamnus*) *pyramidalis* (Hall. f.) Hall. f. in Meded. Rijksherb. Leiden no. 1 (1910), p. 25.

Of this species which, as far as I know, is still only known from the original Welwitsch gatherings 6113 and 6113b, I saw an isotype (*Welwitsch* 6113) in COI. There is no doubt that this species is closely related to *T. shirensis* and *T. holubii*, although the fruits are still unknown.

Turbina curtoi (*Rendle*) *A. Meeuse*, comb. nov. *Ipomoea curtoi* Rendle in Jl. Bot. 46 (1908), p. 182.

Of this species, apparently only known from the type gathering, I examined a photograph of the type (in PRE) and an isotype (*Gossweiler* 4275, in COI). As Rendle pointed out already, this species is very closely related to *Turbina shirensis* (but it is distinct in that it has an umbellate inflorescence and glabrous sepals), and it is, therefore, indubitably a species of *Turbina*.

Index.

| | PAGE |
|--|---|
| Aniseia Choisy..... | 729, 730 |
| <i>A. biflora</i> (L.) Choisy..... | 723 |
| <i>A. calycina</i> (Roxb.) Choisy..... | 728, 729, 730 |
| <i>A. calystegioides</i> Choisy..... | 730 |
| <i>A. hackeliana</i> Schinz..... | 726 |
| Argyreia Choisy..... | 712, 772, 773, 774, 775 |
| <i>Asterochlaena</i> Corda..... | 709 |
| <i>Asterochlaena</i> Garcke..... | 709 |
| <i>Astrochlaena</i> Hall f..... | 709 |
| <i>A. floccosa</i> Hall. f..... | 709 |
| <i>A. lachnosperma</i> (Choisy) Hall. f..... | 709, 710 |
| <i>A. malvacea</i> (Klotzsch) Hall. f..... | 709, 710 |
| <i>A. rotundata</i> Pilger..... | 709, 711 |
| <i>Astripomoea</i> A. Meeuse..... | 644, 709 |
| <i>A. lachnosperma</i> (Choisy) A. Meeuse..... | 709, 710 |
| <i>A. malvacea</i> (Klotzsch) A. Meeuse..... | 709, 710 |
| <i>A. rotundata</i> (Pilger) A. Meeuse..... | 709, 711 |
| Batatas (Choisy) Griseb. (sect. of <i>Ipomoea</i>)..... | 713 |
| <i>Batatas edulis</i> (Thunb.) Choisy..... | 746 |
| <i>Bonamia</i> Thouars..... | 643, 662, 664 |
| <i>B. capensis</i> (E. Mey. ex Choisy) Burt-Davy..... | 663 |
| <i>B. madagascariensis</i> Poir..... | 664 |
| <i>B. poranoides</i> Hall f..... | 665 |
| <i>B. schizantha</i> (Hall. f.) A. Meeuse..... | 665 |
| <i>B. suffruticosa</i> (Schinz) Burt-Davy..... | 663, 664 |
| <i>Bonamyia</i> Neck..... | 664 |
| <i>Breweria</i> R. Br..... | 662, 664 |
| <i>B. baccharoides</i> Baker..... | 663, 664 |
| <i>B. capensis</i> (E. Mey. ex Choisy) Baker..... | 663 |
| <i>B. malvacea</i> Klotzsch..... | 710 |
| <i>B. sessiliflora</i> Baker..... | 663, 664 |
| <i>B. suffruticosa</i> Schinz..... | 663, 664 |
| <i>Calonyction</i> Choisy..... | 711, 712 |
| <i>Calonyction</i> (Choisy) Griseb. (sect. of <i>Ipomoea</i>)..... | 712, 713 |
| <i>C. aculeatum</i> (L.) House..... | 765 |
| <i>C. bona-nox</i> Boj..... | 765 |
| <i>C. speciosum</i> Choisy..... | 765 |
| <i>C. trichospermum</i> var. <i>diversifolium</i> | 761 |
| <i>Calycanthemum</i> Klotzsch (sect. of <i>Ipomoea</i>)..... | 713, 733, 748 |
| <i>Calycanthemum leucanthemum</i> Klotzsch..... | 722 |
| <i>Calystegia</i> R. Br..... | 643, 696 |
| <i>C. sepium</i> (L.) R. Br..... | 697 |
| <i>C. soldanella</i> (L.) R. Br. ex R. et S..... | 697, 698 |
| <i>Cephalanthae</i> (Choisy) Hall. f. (subsect. of <i>Ipomoea</i>)..... | 713, 733 |
| <i>Chrorisanthae</i> Hall. f. (subsect. of <i>Ipomoea</i>)..... | 713 |
| <i>Convolvulus</i> L..... | 643, 666, 694 |
| <i>C. aculeatus</i> L..... | 765 |
| <i>C. albivenius</i> Lindl..... | 768 |
| <i>C. alceifolius</i> Lam..... | 692 |
| <i>C. althaeoides</i> Thunb..... | 690, 692 |
| <i>C. angolensis</i> Baker..... | 683, 684 |
| <i>C. argillicola</i> Pilger..... | 667, 670 |
| <i>C. arvensis</i> L..... | 666, 667, 686, 695 |
| <i>C. aschersonii</i> Engl..... | 668, 677, 678, 679, 680, 684, 695 |
| <i>C. batatas</i> L..... | 746 |
| <i>C. bicolor</i> Desr..... | 698, 736 |
| <i>C. bicolor</i> Vahl..... | 698, 736 |
| <i>C. bidentatus</i> Bernh..... | 667, 684, 685, 686, 695 |
| <i>C. biflorus</i> L..... | 623 |
| <i>C. boedeckerianus</i> Peter..... | 666, 667, 668, 671, 673, 674, 675, 676, 679 |
| <i>C. bullerianus</i> Rendle..... | 666, 687, 689 |
| <i>C. brasiliensis</i> L..... | 754 |
| <i>C. burmannii</i> Choisy..... | 696 |

Convolvulus L.

| | PAGE |
|---|---|
| <i>C. cairicus</i> L..... | 761 |
| <i>C. calycinus</i> E. Mey. ex Choisy..... | 687, 688, 689 |
| <i>C. calycinus</i> H.B.K..... | 687, 689 |
| <i>C. calycinus</i> Roxb..... | 687, 689, 728, 729, 730 |
| <i>C. capensis</i> Burm. f..... | 666, 669, 670, 676, 686, 691, 692-693, 694, 771 |
| <i>C. capensis</i> Burm. f. var. <i>plicatus</i> (Desr.) Baker..... | 690, 691, 692, 693 |
| <i>C. copticus</i> L..... | 760 |
| <i>C. cordifolius</i> Thunb..... | 684, 685 |
| <i>C. corymbosus</i> L..... | 773 |
| <i>C. crispus</i> Thunb..... | 751 |
| <i>C. dichrous</i> R. et S..... | 736 |
| <i>C. dinteri</i> Pilger..... | 667, 673, 684 |
| <i>C. dregeanus</i> Choisy..... | 666, 667, 671, 695 |
| <i>C. falckia</i> Thunb..... | 692 |
| <i>C. falckia</i> Jacq..... | 666, 692, 693 |
| <i>C. farinosus</i> L..... | 668, 679, 684, 685 |
| <i>C. filiformis</i> Desr..... | 692 |
| <i>C. filiformis</i> Thunb..... | 666, 692, 693, 695 |
| <i>C. galpinii</i> C. H. Wright..... | 669, 687, 696 |
| <i>C. hardwickii</i> Spreng..... | 728, 730 |
| <i>C. hastatus</i> Desr..... | 685, 686 |
| <i>C. hastatus</i> Forsk..... | 685, 686 |
| <i>C. hastatus</i> Thunb..... | 679, 685, 686 |
| <i>C. heptaphyllus</i> | 764, 765 |
| <i>C. hirtellus</i> Hall. f..... | 682, 684 |
| <i>C. hispidus</i> Vahl..... | 722 |
| <i>C. huillensis</i> (Baker) Rendle..... | 683, 684 |
| <i>C. inconspicuus</i> Hall. f..... | 666, 691, 693, 694 |
| <i>C. kentrocaulos</i> Steud..... | 704, 705 |
| <i>C. liniformis</i> Rendle..... | 666, 671 |
| <i>C. longipedunculatus</i> Dinter ms..... | 706 |
| <i>C. massonii</i> Dietr..... | 696 |
| <i>C. mauretanicus</i> L..... | 667 |
| <i>C. mucronatus</i> Engl..... | 663, 664 |
| <i>C. multifidus</i> Hall. f..... | 673, 691 |
| <i>C. multifidus</i> Thunb..... | 668, 673, 675, 676, 691 |
| <i>C. namaquensis</i> Schltr. ms..... | 682 |
| <i>C. natalensis</i> Bernh..... | 667, 669, 670, 687-689, 691, 694 |
| <i>C. nil</i> L..... | 733 |
| <i>C. obscurus</i> L..... | 746 |
| <i>C. ocellatus</i> Hook..... | 666, 667, 669, 670, 675, 676, 684 |
| <i>C. ocellatus</i> var. <i>ocellatus</i> | 672 |
| <i>C. ocellatus</i> var. <i>ornatus</i> (Engl.) A. Meeuse..... | 672, 673 |
| <i>C. oenotheroides</i> Linn. f..... | 775, 776 |
| <i>C. oenotherae</i> Vatke..... | 727 |
| <i>C. ornatus</i> Engl..... | 666, 673, 675 |
| <i>C. paniculatus</i> L..... | 767 |
| <i>C. pedatus</i> Roxb..... | 760 |
| <i>C. penicellatus</i> Hall. f..... | 677 |
| <i>C. penicellatus</i> A. Rich..... | 684, 685 |
| <i>C. pes-caprae</i> L..... | 754 |
| <i>C. petraeus</i> Lee ex Choisy..... | 696 |
| <i>C. phyllosepalus</i> Hall. f..... | 681, 684 |
| <i>C. pilosus</i> Rottl..... | 736 |
| <i>C. pilosus</i> Roxb..... | 736 |
| <i>C. plantagineus</i> Choisy..... | 755 |
| <i>C. plicatus</i> Desr..... | 690, 691, 692, 693, 694 |
| <i>C. pterygocaulos</i> Steud..... | 702 |
| <i>C. purpureus</i> L..... | 734 |
| <i>C. radicans</i> Thunb..... | 772 |
| <i>C. randii</i> Randle..... | 672 |
| <i>C. reptans</i> L..... | 753, 754 |
| <i>C. rhynchophyllus</i> Baker ex Engl..... | 678, 679 |
| <i>C. sagittatus</i> Thunb. and vars..... | 667, 668, 669, 673, 677, 678, 679-683, 684, 686 |
| <i>C. septum</i> L..... | 697 |
| <i>C. sinensis</i> Desr..... | 728 |
| <i>C. soldanella</i> L..... | 697, 698 |

Convulvulus L.

PAGE

| | |
|---|-----------------------------------|
| <i>C. steudneri</i> Engl..... | 683 |
| <i>C. sublobatus</i> Linn. f..... | 698 |
| <i>C. thompsonii</i> Baker..... | 680 |
| <i>C. thunbergii</i> Hall. f..... | 675 |
| <i>C. thunbergii</i> R. et S..... | 667, 669, 670, 689, 690, 691, 694 |
| <i>C. tiliifolius</i> Desr..... | 772 |
| <i>C. transvaalensis</i> Schltr..... | 666, 687, 689 |
| <i>C. trilobus</i> Thunb..... | 738, 739 |
| <i>C. ulosepalus</i> Hall. f..... | 667, 668, 678, 679, 684, 685 |
| <i>C. wightii</i> Wall..... | 737 |
| Cuscuta L. | 641, 642, 643, 644 |
| <i>C. abyssinica</i> | 655 |
| <i>C. africana</i> Willd..... | 646, 652, 653, 655 |
| <i>C. africana</i> var. <i>capensis</i> Baker..... | 652 |
| <i>C. alpestris</i> Fourc..... | 652 |
| <i>C. americana</i> Thunb. non L..... | 652 |
| <i>C. angulata</i> Engelm..... | 646, 655 |
| <i>C. appendiculata</i> Engelm..... | 645, 649, 650 |
| <i>C. appendiculata</i> var. <i>macroflora</i> Yunck..... | 649 |
| <i>C. australis</i> R. Br..... | 645, 647, 648 |
| <i>C. balansae</i> Boiss. et Reutt..... | 655 |
| <i>C. balansae</i> var. <i>mossamedensis</i> (Welw.) Yunck..... | 655 |
| <i>C. bifurcata</i> Yunck..... | 645, 648 |
| <i>C. brevistyla</i> A. Braun..... | 655 |
| <i>C. campestris</i> Yunck..... | 644, 645, 647, 648, 657 |
| <i>C. capensis</i> Choisy..... | 652 |
| <i>C. cassytoides</i> Nees ex Engelm..... | 645, 651 |
| <i>C. cordofana</i> (Engelm.) Yunck..... | 646 |
| <i>C. cucullata</i> Yunck..... | 652 |
| <i>C. epithimum</i> Murr. ex L..... | 644, 647, 656 |
| <i>C. epitribulum</i> Schinz..... | 650 |
| <i>C. europaea</i> L..... | 644 |
| <i>C. gerrardii</i> Baker..... | 646, 652 |
| <i>C. hyalina</i> Roth..... | 646, 650 |
| <i>C. hyalina</i> var. <i>nubiana</i> | 646 |
| <i>C. kilimanjari</i> Oliv..... | 645, 650 |
| <i>C. madagascarensis</i> Yunck..... | 655, 656 |
| <i>C. madagascarensis</i> var. <i>schlechteri</i> Yunck..... | 656 |
| <i>C. medicaginis</i> C. H. Wright..... | 648 |
| <i>C. natalensis</i> Baker..... | 646, 653 |
| <i>C. nitida</i> E. Mey. ex Choisy..... | 646, 654, 655 |
| <i>C. obtusiflora</i> H. B. et K..... | 646, 650 |
| <i>C. planiflora</i> Ten..... | 655 |
| <i>C. planiflora</i> var. <i>madagascarensis</i> (Yunck) A. Meeuse..... | 646, 656 |
| <i>C. planiflora</i> var. <i>mossamedensis</i> Welw. ex Hiern..... | 647, 655 |
| <i>C. planiflora</i> var. <i>planiflora</i> | 655 |
| <i>C. suaveolens</i> Ser..... | 644, 646, 648 |
| <i>C. timorensis</i> Decne..... | 651 |
| <i>C. trifolii</i> Babingt..... | 656 |
| <i>Dasychaetia</i> Hall. f. (sect. of <i>Ipomoea</i>)..... | 713, 733 |
| <i>Dichondra</i> J. G. et R. Forst..... | 643, 657 |
| <i>D. repens</i> J. G. et R. Forst..... | 657 |
| Evolvulus L. | 643, 661 |
| <i>E. alsinoides</i> (L.) L..... | 661 |
| <i>E. alsinoides</i> var. <i>linifolius</i> Baker..... | 662 |
| <i>E. alsinoides</i> var. <i>glaber</i> | 662 |
| <i>E. capensis</i> E. Mey. ex Choisy..... | 663 |
| <i>E. hederaceus</i> Burm. f..... | 700 |
| <i>E. mummularius</i> L..... | 641, 661 |
| Falckia see <i>Falkia</i> . | |
| Falkia Linn. f..... | 643, 658 |
| <i>F. abyssinica</i> Engl..... | 660 |
| <i>F. dichondroides</i> Baker..... | 659, 660 |
| <i>F. diffusa</i> (Choisy) Hall. f..... | 659, 660 |
| <i>F. oblonga</i> Bernh..... | 659, 660, 661 |
| <i>F. repens</i> Linn. f..... | 658, 648, 659, 660, 661 |
| <i>F. villosa</i> Hall. f..... | 659 |

| | |
|---|--|
| Hewittia W. et A..... | 643, 698 |
| <i>H. bicolor</i> (Vahl) Wight..... | 698 |
| <i>H. sublobata</i> (Linn. f.) O. Ktze..... | 698, 736 |
| Ipomoea L. | 644, 700, 701, 708, 711, 772, 773, 774 |
| <i>I. adenioides</i> Schinz..... | 712, 720, 770, 771 |
| <i>I. adumbrata</i> Rendle et Britten..... | 730 |
| <i>I. aitoni</i> Choisy..... | 738 |
| <i>I. alba</i> L..... | 720, 765 |
| <i>I. albivenia</i> (Lindl.) Sweet..... | 719, 768 |
| <i>I. angulata</i> E. Mey. ex Drège..... | 738 |
| <i>I. angustifolia</i> Jacq..... | 706, 771 |
| <i>I. angustisecta</i> Engl..... | 758, 759 |
| <i>I. aquatica</i> Forsk..... | 716, 753, 754 |
| <i>I. arachnoidea</i> Boj..... | 737 |
| <i>I. arachnoidea</i> Choisy..... | 738 |
| <i>I. arachnosperma</i> Welw..... | 714-5, 736, 737-9 |
| <i>I. argyreoides</i> Choisy..... | 771, 775-6 |
| <i>I. aspericaulis</i> Baker..... | 756 |
| <i>I. asperifolia</i> Hall, f..... | 732-3 |
| <i>I. atherstonei</i> Baker..... | 718, 732, 741, 780 |
| <i>I. auxocalyx</i> Pilger..... | 728 |
| <i>I. awasmontana</i> Dinter ms..... | 780 |
| <i>I. baclei</i> Choisy..... | 766-7 |
| <i>I. barrettii</i> Randle..... | 771, 775-6 |
| <i>I. batatas</i> (L.) Lam..... | 715, 720, 746 |
| <i>I. bathycolpos</i> Hall, f..... | 716, 749, 750 |
| <i>I. bellecomans</i> Rendle..... | 730, 731 |
| <i>I. biflora</i> (L.) Pers..... | 723 |
| <i>I. biloba</i> Forsk..... | 754 |
| <i>I. bipinnipartita</i> Engl..... | 705 |
| <i>I. blepharophylla</i> Hall, f..... | 733 |
| <i>I. blepharosepala</i> Hochst. ex A. Rich..... | 729 |
| <i>I. bolusiana</i> Schinz..... | 715, 720, 756, 757, 758 |
| <i>I. bona-nox</i> L..... | 765 |
| <i>I. bowieana</i> (Rendle) Baker..... | 692, 693, 771 |
| <i>I. cairica</i> (L.) Sweet..... | 720, 761, 765 |
| <i>I. calcarata</i> N. E. Br..... | 760 |
| <i>I. calophylla</i> Fenzl..... | 736, 737 |
| <i>I. calycina</i> Benth. ex C. B. Clarke..... | 728, 729 |
| <i>I. calycnia</i> Meissn..... | 728, 729 |
| <i>I. cana</i> E. Mey. ex Drège..... | 775 |
| <i>I. calystegioides</i> (Choisy) Hall, f..... | 730 |
| <i>I. cardiosepala</i> Hochst. ex Fl. Cap..... | 729, 730 |
| <i>I. cardiosepala</i> Meissn..... | 729, 730 |
| <i>I. carnosia</i> R. Br..... | 772 |
| <i>I. ceciliae</i> N. E. Br..... | 727, 728 |
| <i>I. chloroneura</i> Hall, f..... | 714, 739 |
| <i>I. clappertonii</i> R. Br..... | 753 |
| <i>I. commatophylla</i> A. Rich..... | 728 |
| <i>I. conceiroi</i> Rendle..... | 769 |
| <i>I. congesta</i> R. Br..... | 717, 734, 735, 738 |
| <i>I. contorta</i> Choisy..... | 751 |
| <i>I. contorta</i> Engl..... | 776 |
| <i>I. convolvuloides</i> Hall, f..... | 748, 749 |
| <i>I. convolvuloides</i> Schinz..... | 706, 749 |
| <i>I. coptica</i> (L.) Roth..... | 720, 760 |
| <i>I. coccinosperma</i> Hochst. ex Choisy..... | 714, 721, 722 |
| <i>I. crassipes</i> Hook..... | 715, 717, 718, 730, 732, 733, 749, 779 |
| <i>I. crispa</i> (Thunb.) Hall, f..... | 719, 751, 752, 778, 779, 780 |
| <i>I. curtoi</i> Rendle..... | 771, 774, 784 |
| <i>L. cynanchifolia</i> C. B. Clarke..... | 723, 724, 725 |
| <i>I. cynanchifolia</i> Meissn..... | 723 |
| <i>I. dammarana</i> Rendle..... | 769 |
| <i>I. dasysperma</i> Jacq..... | 720, 760, 761, 765 |
| <i>I. demissa</i> Hall, f..... | 747, 748 |
| <i>I. dichroa</i> (R. et S.) Hochst. ex Choisy..... | 736 |
| <i>I. digitata</i> L..... | 719, 720, 767 |

Ipomoea L.

PAGE

| | |
|--|-------------------------|
| <i>I. dinteri</i> Schulze-Menz..... | 733 |
| <i>I. dissecta</i> Willd..... | 760 |
| <i>I. eenii</i> Rendle..... | 743 |
| <i>I. eriocarpa</i> R. Br..... | 714, 721, 725 |
| <i>I. ficifolia</i> Lindl..... | 715, 738, 739 |
| <i>I. fragilis</i> Choisy..... | 747 |
| <i>I. fragrans</i> Boj..... | 766 |
| <i>I. geminiflora</i> Welw..... | 721, 724, 725 |
| <i>I. gerrardi</i> Hook. f..... | 768 |
| <i>I. gerrardiana</i> Rendle..... | 734 |
| <i>I. gracilisepala</i> Rendle..... | 714, 725, 726 |
| <i>I. gracilisepala</i> var. <i>lyciifolia</i> (Merxm.) A. Meeuse..... | 726 |
| <i>I. greenstockii</i> Rendle..... | 730, 731, 749 |
| <i>I. hackeliana</i> (Schinz) Hall. f..... | 713, 726 |
| <i>I. hardwickii</i> (Spreng.) Hemsl..... | 728 |
| <i>I. hederacea</i> Jacq..... | 733, 734 |
| <i>I. hederacea</i> Auct. non Jacq..... | 733 |
| <i>I. hellebarda</i> Schweinf. ex Hall. f..... | 742, 753 |
| <i>I. heptaphylla</i> (Rottl. et Willd.) Voigt..... | 720, 761, 762, 764, 765 |
| <i>I. heterophylla</i> R. Br. non Ortega..... | 728 |
| <i>I. hewittiioides</i> Hall. f..... | 731, 732 |
| <i>I. hispida</i> (Vahl.) R. et S..... | 721 |
| <i>I. hispida</i> Zucc..... | 721 |
| <i>I. hochstetteri</i> House..... | 720, 762, 764, 765 |
| <i>I. holosericea</i> E. Mey. ex Drège..... | 738 |
| <i>I. holubii</i> Baker..... | 771, 780, 782 |
| <i>I. huillensis</i> Baker..... | 683 |
| <i>I. hystrix</i> Hall. f..... | 756 |
| <i>I. inamoena</i> Pilger..... | 756, 757 |
| <i>I. involuocrata</i> P. Beauv..... | 713, 744, 745 |
| <i>I. kentrocaulos</i> Clarke..... | 764, 765 |
| <i>I. kwebensis</i> N. E. Br..... | 762, 763 |
| <i>I. lachnosperma</i> Choisy..... | 709, 710 |
| <i>I. lambtoniana</i> Rendle..... | 771, 778 |
| <i>I. lapathifolia</i> Hall. f..... | 720, 752, 753 |
| <i>I. learii</i> Paxt..... | 735 |
| <i>I. leucanthemum</i> (Klotzsch) Hall. f..... | 714, 722 |
| <i>I. linosepala</i> Hall. f..... | 726 |
| <i>I. lineariloba</i> Chiov..... | 727 |
| <i>I. lilacina</i> Bl..... | 766, 767 |
| <i>I. longipes</i> Garcke..... | 747 |
| <i>I. longipes</i> Engl..... | 747, 748 |
| <i>I. lugardii</i> N. E. Br..... | 742, 743 |
| <i>I. lyciifolia</i> Merxm..... | 726 |
| <i>I. magnusiana</i> Schinz..... | 720, 742-743 |
| <i>I. malvaefolia</i> (Rendle) Baker..... | 706, 771 |
| <i>I. marlothii</i> Engl..... | 770 |
| <i>I. maxima</i> (L. f.) Don. ex Sweet..... | 754 |
| <i>I. megalochlamys</i> Baker..... | 684 |
| <i>I. mesenteroides</i> Hall. f..... | 758, 759 |
| <i>I. natans</i> Dinter et Suesseng..... | 753 |
| <i>I. nil</i> (L.) Roth..... | 717, 733, 734, 736 |
| <i>I. oblongata</i> E. Mey. ex Choisy..... | 771, 774, 778 |
| <i>I. obscura</i> (L.) Ker..... | 716, 746-747, 748 |
| <i>I. odontosepala</i> Baker..... | 760 |
| <i>I. oenotherae</i> (Vatke) Hall. f..... | 715, 720, 727, 728 |
| <i>I. oenotheroides</i> (Linn. f.) Rafin. ex Hall. f..... | 771, 774, 775 |
| <i>I. ommaneyi</i> Rendle..... | 718, 732, 740, 741, 742 |
| <i>I. operosa</i> C. H. Wright..... | 745 |
| <i>I. otjikangensis</i> Dinter et Pilger..... | 742, 743 |
| <i>I. ovata</i> E. Mey. ex Rendle..... | 732 |
| <i>I. pachypus</i> Pilger..... | 727, 728 |
| <i>I. palmata</i> Forsk..... | 761 |
| <i>I. paniculata</i> (L.) R. Br..... | 767 |
| <i>I. papilio</i> Hall. f..... | 716, 717, 750, 751 |
| <i>I. parkeri</i> Choisy..... | 766 |

Ipomoea L.

| | PAGE |
|---|------------------------------|
| <i>I. pellita</i> Hall. f..... | 696, 718, 732, 752, 780 |
| <i>I. pentaphylla</i> (L.) Jacq..... | 737 |
| <i>I. pes-caprae</i> (L.) Sweet..... | 714, 754, 755 |
| <i>I. pes-trigrifida</i> L..... | 711, 720, 744 |
| <i>I. petunoides</i> Baker..... | 727, 728 |
| <i>I. pileata</i> Roxb..... | 713, 745 |
| <i>I. pilosa</i> Cav..... | 736, 737 |
| <i>I. pilosa</i> Houtt..... | 736 |
| <i>I. pilosa</i> (Roxb.) Sweet..... | 736, 737 |
| <i>I. pinnata</i> Hochst. ex Choisy..... | 707 |
| <i>I. plantaginea</i> (Choisy) Hall. f..... | 696, 755, 756 |
| <i>I. plebeia</i> R. Br..... | 714, 722, 723, 725 |
| <i>I. plebeia</i> var. <i>africana</i> A. Meeuse..... | 723 |
| <i>I. polymorpha</i> R. et S..... | 728 |
| <i>I. praetermissa</i> Rendle..... | 758, 759 |
| <i>I. pterygocaulos</i> (Steud. ex) Choisy..... | 702 |
| <i>I. pulchella</i> Roth..... | 762, 764, 765 |
| <i>I. purpurea</i> (L.) Roth..... | 717, 733, 734, 735, 736 |
| <i>I. pyramidalis</i> Hall. f..... | 771, 782, 784 |
| <i>I. quinquefolia</i> Hochst..... | 762, 763 |
| <i>I. quinquefolia</i> (L.) Griseb..... | 762, 763 |
| <i>I. quinquefolia</i> var. <i>pubescens</i> Baker..... | 703, 764, 771 |
| <i>I. quinquefolia</i> var. <i>purpurea</i> Hall. f..... | 762 |
| <i>I. randii</i> Rendle..... | 778 |
| <i>I. reptans</i> Poir..... | 753, 754 |
| <i>I. rhodesiana</i> Rendle..... | 772, 780, 781 |
| <i>I. riparia</i> G. Don..... | 717, 766, 767 |
| <i>I. robertsiana</i> Rendle..... | 772, 774, 777, 778 |
| <i>I. rubro-coerulea</i> Hook..... | 759 |
| <i>I. saccata</i> Hall. f..... | 760, 761 |
| <i>I. sagittaeifolia</i> Burm. f..... | 753, 754 |
| <i>I. sagittaeifolia</i> Hochr..... | 753, 754 |
| <i>I. sarmentacea</i> Rendle..... | 730, 731 |
| <i>I. saundersiana</i> Baker..... | 708, 772 |
| <i>I. seineri</i> Pilger..... | 769, 770 |
| <i>I. semisecta</i> Merxm..... | 756, 757 |
| <i>I. shirambensis</i> Baker..... | 719, 770 |
| <i>I. shirensis</i> Oliv..... | 771, 774, 782 |
| <i>I. simplex</i> Hook..... | 758, 759 |
| <i>I. simplex</i> Thunb..... | 696, 715, 755, 756, 758, 759 |
| <i>I. sinensis</i> (Desr.) Choisy..... | 689, 714, 723, 729, 730 |
| <i>I. sinensis</i> var. <i>blepharosepala</i> (A. Rich.) Verdc..... | 724 |
| <i>I. stenosphon</i> Hall. f..... | 772, 774, 783 |
| <i>I. stolonifera</i> (Cyrill.) J. F. Gmel..... | 772 |
| <i>I. sublucens</i> Rendle..... | 776 |
| <i>I. suffruticosa</i> Burch..... | 772, 774, 776, 782 |
| <i>I. tenuirostris</i> Choisy..... | 725 |
| <i>I. tenuis</i> E. Mey. ex Drège..... | 747 |
| <i>I. tetraptera</i> Baker..... | 702, 772 |
| <i>I. transvaalensis</i> A. Meeuse..... | 716, 718, 748, 749 |
| <i>I. trichosperma</i> Bl..... | 761 |
| <i>I. tricolor</i> Cav..... | 716, 759 |
| <i>I. triloba</i> L..... | 739 |
| <i>I. tuberosa</i> A. Rich. non L..... | 705 |
| <i>I. uncinata</i> Hutch..... | 772, 777, 778 |
| <i>I. undulata</i> Baker..... | 751, 752 |
| <i>I. verbascoidea</i> Choisy..... | 719, 769, 770 |
| <i>I. verecunda</i> (Rendle) N. E. Br..... | 703 |
| <i>I. verticillata</i> Forsk..... | 724, 725 |
| <i>I. violacea</i> L..... | 759 |
| <i>I. vitifolia</i> E. Mey. ex Drège..... | 738 |
| <i>I. welwitschii</i> Vatke..... | 715, 718, 720, 756, 758, 759 |
| <i>I. wightii</i> (Wall) Choisy..... | 714, 737, 738, 739 |
| <i>I. woodii</i> N. E. Br..... | 772, 773 |
| <i>I. xiphosepala</i> Baker..... | 725, 726 |
| <i>I. zambesiaca</i> Baker..... | 752 |

| | PAGE |
|--|------------------------------|
| Jacquemontia Choisy..... | 643, 699 |
| <i>J. capitata</i> (Desr.) G. Don..... | 700 |
| <i>J. ferruginea</i> (Steud.) Choisy..... | 699 |
| <i>J. tamnifolia</i> (L.) Griseb..... | 700 |
| <i>J. thomensis</i> Henriq..... | 721 |
| <i>Legendrea</i> Webb, et Berth..... | 773, 774 |
| <i>Leiocalyx</i> Hall. f. (sect. of <i>Ipomoea</i>)..... | 712, 713 |
| Merremia Dennst. ex Hall. f..... | 643, 694, 700, 701, 708, 712 |
| <i>M. aegyptia</i> (L.) Urb..... | 737 |
| <i>M. angustifolia</i> (Jacq.) Hall. f..... | 706 |
| <i>M. bipinnipartita</i> (Engl.) Hall. f..... | 702, 705 |
| <i>M. bowieana</i> Rendle..... | 666, 692, 693, 695, 771 |
| <i>M. caespitosa</i> (Roxb.) Hall. f..... | 754 |
| <i>M. convolvulacea</i> Dennst..... | 700 |
| <i>M. hederacea</i> (Burm. f.) Hall. f..... | 700 |
| <i>M. hirta</i> (L.) Merr..... | 754 |
| <i>M. kentrocaulos</i> (C. B. Clarke) Rendle..... | 701, 704, 705 |
| <i>M. malvaefolia</i> Rendle..... | 702, 771 |
| <i>M. palmata</i> Hall. f..... | 701, 704 |
| <i>M. pinnata</i> (Hochst. ex Choisy) Hall. f..... | 701, 707 |
| <i>M. pterygocaulos</i> (Choisy) Hall. f..... | 701, 702, 772 |
| <i>M. quercifolia</i> Hall. f..... | 701 |
| <i>M. tetraptera</i> (Baker) Hall. f..... | 702 |
| <i>M. tridentata</i> (L.) Hall. f. ssp. <i>angustifolia</i> (Jacq.) Ooststr..... | 686, 702, 706, 749, 771 |
| <i>M. tuberosa</i> (L.) Rendle..... | 705, 708 |
| <i>M. umbellata</i> (L.) Hall. f..... | 736, 737 |
| <i>M. verecunda</i> Rendle..... | 701, 703, 764, 771 |
| Metaporana N. E. Br..... | 664-5 |
| <i>M. angolensis</i> N. E. Br..... | 665 |
| <i>M. densiflora</i> (Hall. f.) N. E. Br..... | 665 |
| Operculina S. Manso..... | 643, 705, 708, 712 |
| <i>O. kentrocaulos</i> Hall. f..... | 704-5 |
| <i>O. turpethum</i> (L.) S. Manso..... | 701, 708, 772 |
| Pharbitis Choisy..... | 711-2 |
| Pharbitis (Choisy) Griseb. (Sect. of <i>Ipomoea</i>)..... | 713, 733 |
| <i>P. fragrans</i> Boj. ex Choisy..... | 766 |
| Polyothamnus (sect. of <i>Rivea</i> sensu Hall. f.)..... | 771, 782 |
| Porana Burm. f..... | 665 |
| <i>P. densiflora</i> Hall. f..... | 665 |
| <i>P. subrotundifolia</i> De Wild..... | 782 |
| Quamoclit Moench..... | 712 |
| Rivea Choisy..... | 711-2, 773 |
| <i>R. adenioides</i> (Schinz) Hall. f..... | 712, 770 |
| <i>R. holubii</i> (Baker) Hall. f..... | 780 |
| <i>R. oenotheroides</i> (Linn. f.) Hall. f..... | 775 |
| <i>R. pyramidalis</i> (Hall. f.) Hall. f..... | 784 |
| <i>R. shirensis</i> ("schirensis") (Oliv.) Hall. f..... | 782 |
| <i>R. stenosphon</i> (Hall. f.) Hall. f..... | 783 |
| <i>R. suffruticosa</i> (Burch.) Hall. f..... | 776 |
| Schrebera schinoides L..... | 652-3 |
| Seddera Hochst..... | 643, 662 |
| <i>S. capensis</i> (E. Mey. ex Choisy) Hall. f..... | 662, 663 |
| <i>S. mucronata</i> (Engl.) Hall. f..... | 663 |
| <i>S. schizantha</i> Hall. f..... | 665-6 |
| <i>S. suffruticosa</i> (Schinz) Hall. f..... | 663, 664 |
| <i>S. virgata</i> Hochst. et Steud..... | 662 |
| <i>S. welwitschii</i> Hall. f..... | 663-4 |
| <i>S. welwitschii</i> var. <i>bakeri</i> Hiern..... | 664 |
| <i>Shutereia</i> Choisy..... | 698 |
| <i>S. bicolor</i> (Vahl) Choisy..... | 698 |
| <i>S. sublobata</i> (Linn. f.) House..... | 698 |
| <i>Shuteria</i> W. et A..... | 698 |
| <i>Skinneria</i> Choisy non Forst..... | 701 |
| <i>Spiranthera</i> Boj. non St. Hil..... | 701 |
| Streptandra Hall. f. (Sect. of <i>Merremia</i>)..... | 701 |

| | |
|---|--|
| Stictocardia Hall. f..... | 644, 712-3, 772 |
| <i>S. tiliifolia</i> (Desr.) Hall. f..... | 772 |
| <i>S. woodii</i> (N. E. Br.) Hall. f..... | 772, 773 |
| Turbina Rafin..... | 644, 712-3, 715, 719, 771, 773, 774-5 |
| <i>T. corymbosa</i> (L. Rafin.....) | 773-4 |
| <i>T. curtoi</i> (Rendle) A. Meeuse..... | 771, 774-5, 784 |
| <i>T. holubii</i> (Baker) A. Meeuse..... | 717-9, 771, 774-5, 780, 782 |
| <i>T. oblongata</i> (E. Mey. ex Choisy) A. Meeuse..... | 715, 717-8, 732-3, 741-2, 752, 771, 774-5, 778 |
| <i>T. oenotheroides</i> (Linn. f.) A. Meeuse..... | 696, 771, 774, 775, 776-7 |
| <i>T. pyramidalis</i> (Hall. f.) A. Meeuse..... | 771, 774-5, 784 |
| <i>T. robertsiana</i> (Rendle) A. Meeuse..... | 715, 719, 772, 775, 777, 780 |
| <i>T. shirensis</i> (Oliv.) A. Meeuse..... | 720, 772, 774-5, 782, 784 |
| <i>T. stenosphon</i> (Hall. f.) A. Meeuse..... | 720, 772, 774-5, 783 |
| <i>T. suffruticosa</i> (Burch.) A. Meeuse..... | 772, 774-5, 776 |
| <i>Volvulopsis</i> Roberty..... | 641 |
| <i>Volvulus</i> Medik..... | 696 |
| <i>Xanthips</i> (Criseb.) Hall. f. (Sect. of <i>Merremia</i>)..... | 701 |