

The Oleaceae of Southern Africa.

By

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The area covered in this revision is the Union of South Africa, Swaziland, South West Africa, and the region of the Bechuanaland Protectorate which lies between South West Africa and the Transvaal. To date, collecting in South West Africa and the Protectorate has not been extensive and so the citations from these regions may give a wrong impression—the family may be better represented there than it appears to be.

All the material of Oleaceae from the following herbaria was sent on loan for examination and most of the specimens seen have been cited (the symbols used in the citations follow the names): Bolus Herbarium (BOL); South African Museum (SAM); Kirstenbosch (NBG); Albany Museum (GRA); Natal Herbarium (NH); Witwatersrand University (J); Forest Department (FD); Ryksherbarium, Leiden (L); and the Natal University Herbarium, Pietermaritzburg (PMB). A number of specimens specially asked for were sent from the Royal Botanic Gardens, Kew (K).

In the citations of the specimens, if a specimen is in the National Herbarium, Pretoria (PRE), no symbol follows it; if not at Pretoria but in one or more of the other South African Herbaria, the symbol of ONE of them is added—e.g. Pillans 5271 (BOL), even if it is also in the Kirstenbosch herbarium; if the specimen is in the Kew or Leiden herbarium or both these overseas herbaria their symbols are added in every case together with one of the South African herbaria (including Pretoria in this instance) if it is also in that herbarium—e.g. Burchell 8236 (K, L, GRA) or Grenfell 869 (K, PRE). In view of the large number of specimens examined this economy in the use of symbols, instead of cutting out some citations, seems to be justified.

Among the abbreviations used in the citations of literature the only one that may not be easily recognised is F.T.E.A. for the "Flora of Tropical East Africa".

The decision as to the correct authority for certain species needs some explanation. Harvey's species *Menodora juncea* was published in Harvey's *Genera Plantarum*, 2nd edition, four years after his death, edited by J. D. Hooker. It has been suggested that the name should be attributed to "Hook. f." rather than to Harvey. Article 58 of the International Code of Botanical Nomenclature provides that if the publishing author supplied the description his name should be retained rather than that of the one who proposed the name but did not publish it. In this case, however, all the description there is of *Menodora juncea* is Harvey's, based on the material in his herbarium and therefore, in my opinion, Harvey is the correct author of the species.

In like manner the descriptions of *Jasminum breviflorum*, *J. gerrardi* and *Olea enervis*, published several years after Harvey's death by Wright in the *Flora Capensis*, were essentially Harvey's and therefore if abbreviating the authority "Harvey in Wright" Harvey's name should be retained in preference to the publishing author who did not supply the original description.

In the case of *Jasminum streptopus*, the authority given in the *Index Kewensis* and the *Flora Capensis*, is "E. Mey. ex DC.", but Meyer described this species in his "Commentariorum" in 1837 and is therefore the author without qualification. This applies also to *J. angulare* var. *glabratum* E. Mey. and a few more of his varieties in this genus.

I am much indebted to the Directors of the herbaria mentioned above, not only for the loan of the specimens but, in many cases, for assistance and advice from them and members of their staffs. I am also indebted to the Directors of the herbaria at Berlin-Dahlem, Geneva and Paris for photographs of type specimens.

FAMILY CHARACTERS.

Trees, shrubs, climbers or occasionally low herbaceous woody-based plants. *Leaves* opposite (rarely alternate in the low sub-herbaceous plants), exstipulate, simple or compound, acarodomatia sometimes present on underside of leaves in axils of veins. *Inflorescence* cymous usually paniculate or occasionally only one flower developing, or flowers appearing fascicled. *Flowers* regular, hermaphrodite or occasionally unisexual, sometimes with heterostylous arrangement. *Calyx* shortly or deeply 2-15-lobed. *Corolla* gamopetalous, 4 or more lobed, sometimes lobed almost to the base. *Stamens* normally 2, epipetalous. *Ovary* superior, bilocular with 2 to 4 ovules in each loculus. *Fruit* dry or fleshy, dehiscent or indehiscent.

Key to Genera.

- Fruit a woody capsule; corolla salver-shaped, tube well developed, lobes spreading, with a group of swollen brown to purplish hairs at the base of the lobes. . . . 1. *Schrebera*.
- Fruit a drupe, berry or membranous capsule, never a woody capsule; corolla-lobes without a group of swollen brown to purplish hairs at their base:
- Fruit a drupe or berry; trees, shrubs or climbers:
- Corolla-tube long and slender; lobes narrow; fruit a berry, 2-lobed, one usually aborting; climbers or bushy shrubs. 2. *Jasminum*.
- Corolla-tube short to almost none:
- Leaves without acarodomatia; calyx toothed or shallowly lobed; corolla-tube short but distinct, lobes only slightly longer than broad; inflorescence terminal or axillary, very many flowered; ovules pendulous, seed albuminous. 3. *Olea*.
- Leaves on flowering branches usually with acarodomatia; calyx deeply lobed; corolla-tube very short, usually slit to base between alternate lobes, lobes usually appearing distinctly longer than broad* because of deeply infolded margins; apex cucullate; inflorescence axillary often on old wood, few-flowered; ovules attached ventrally; seeds exalbuminous, cotyledons thick. 4. *Linociera*.
- Fruit a membranous capsule; low virgate shrublet or herbaceous plant with woody base; corolla yellow. 5. *Menodora*.

* Except in *L. latipetala* in trop. Africa.

1. SCHREBERA.

Roxb., Pl. Coromandel 2: 1, t. 101 (1798) nomen conservandum; Harv. ex Wright in Fl. Cap. 4, 1: 482 (1907); Phill. Gen. S.A. Fl. Plants Ed. 2: 571 (1951); *Nathusia* Hochst. in Flora (1841).

Trees or shrubs (sometimes sub-scandent?). *Leaves* opposite, compound (simple in some species outside S. Africa), rachis usually winged. *Inflorescence* a paniculate cyme. *Flowers* heterostylous. *Calyx* campanulate, loosely enveloping the corolla, truncate or irregularly and obscurely lobed. *Corolla* salver-shaped, white, sometimes tinged with pink or puce; tube well developed, cylindrical; segments 6 or more, spreading to reflexed, each with a group of swollen brown to purplish hairs at the base. *Stamens* 2, inserted on the corolla either in the throat with the anthers exerted or a little below the throat with the anthers included; filaments short, anthers large, introrse.

Ovary bilocular, small, truncate or obscurely bi-lobed at apex; ovules 4 in each loculus; style filiform; stigma included or exerted, subcapitate or oblong in outline. *Capsule* bi-valved, woody with loculicidal dehiscence; seeds produced into a long solitary subapical wing.

Type species: *S. Swietenioides* Roxb., Burma.

The genus *Schrebera* is found in Africa and India, mostly in the tropics. The two species that extend into S. Africa have compound leaves. There is not a single record of a simple-leaved species from inside the Union, the nearest being *S. trichoclada* Welw., found quite frequently in the Zambesi basin with one record as far south as Lundi, S. Rhodesia. In P.E.A. the southernmost record is on the north bank of the Save River.

Key to Species.

- Branchlets glabrous or occasionally puberulous; leaves glabrous; branches of inflorescence and calyx persistently puberulous, never tomentulose nor quite smooth; cymes not very compact..... 1. *S. alata*.
 Branchlets grey or silvery tomentulose; leaves pubescent or glabrescent; branches of inflorescence and calyx tomentulose, the calyx sometimes becoming quite smooth (never puberulous); cymes compact..... 2. *S. argyrotricha*.

1. *Schrebera alata* (Hochst.) Welw. in Trans. Linn. Soc. Bot. 27: 41 (1869); Turrill in F.T.E.A. (1952); *Nathusia alata* Hochst. in Flora 24. 1: 25 and 2: 672 (1841); *Schrebera saundersiae* Harv. in Thes. Cap. 2: 40, tab. 163 (1859); Wright in Fl. Cap. 4, 1: 483 (1907); *Schrebera latialata* Gilg in Bot. Jb. 30: 73 (1901).

Tree (said to occur occasionally as a sub-scandent shrub in Natal), found in the marginal flora of forests and the coastal bush in Natal, sometimes small, more or less 12 feet tall with slender stem and branches, or about 25 feet tall with stem 1 foot in diameter, bark greyish or light brown in colour. *Branchlets* glabrous or puberulous, not tomentulose. *Leaves* glabrous, 5–13 cm. long, 5-foliolate, sometimes 3-foliolate; leaflets varying considerably in size, texture and shape, the lateral elliptic to broadly elliptic or oblong, unequally cuneate at the base, about 3–7 cm. long and 1–4 cm. broad, the terminal usually a little larger than the other leaflets, more obovate oblong, sometimes elliptic, subsessile or cuneate into a petiolule up to 1 cm. long; petiole and rhachis winged, wing variable, narrow or broad, auricled at base or not. *Inflorescence* puberulous, about 6 to 11 cm. long, the lateral branches slender, usually over 2 cm. long; bracts deciduous variable in size, some 5 mm. long and 2 mm. broad, often narrower, rarely broader. *Calyx* more or less tubular-turbinate, persistently puberulous outside sometimes densely so, almost velvety, pubescent in upper portion within, more or less truncate and slit or variously lobed, persisting in fruit. *Flowers* sweetly scented, white suffused with pink or puce at different stages, tube cylindrical about 1.4 cm. long, glabrous or variously puberulous in parts outside, often pubescent with rather long hairs near the base within; lobes suborbicular, about 5 mm. long, crenate on margins, spreading, with a cluster of glandular reddish-brown hairs near the base on inner face. *Stamens* 2, heterostylus, inserted near the apex of the corolla and then exerted or in other specimens below the apex and then included. *Ovary* 2-celled, about 1.5 mm. long, somewhat flattened and puberulous on top, obscurely 2-lobed; ovules 4 in each cell, pendulous; style about 1.5 cm. long, glabrous or sometimes sparsely pubescent with short patent gland-tipped hairs, long exerted in flowers with stamens included and vice versa; stigma about 1.5 mm. long, obscurely 2-lobed. *Capsule* green when young (turning black on drying) becoming light brown at maturity, puberulous except at base within calyx, obovate-oblong, slightly laterally flattened at right angles to the septum, parallel to the wall of division with a ridge along the septum. *Seeds* 8 mm. long with an oblong 1.1 cm. × 6 mm. subterminal wing (degree to which wing runs down one side varies, also width).

FIG. 1.

Type: Schimper 245, Abyssinia. Types of synonyms: *S. saundersiae* Harv., *Gerrard* 1153, Durban; *S. latialata* Gilg, *Medley Wobd* 5201, Durban.

TRANSVAAL.—Soutpansberg: Entabini, Maviewa Kop, *Poynton* 78 (F.D.); Sibasa, *Junod* in Tvl. Mus. 21199; nr. Sibasa, Tshaulau, *Codd* 6913 (leafy branch, 3-foliolate); *van Warmelo* s.n. (3 sheets). Pilgrims Rest: Kowyns Pass, *Codd & Verdoorn* 7604; *Story* 4000; Mariepskop, *van Son* in Tvl. Mus. 30712; *Fitzsimons & Van Dam* in Tvl. Mus. 26,537; *Keet* in F.D. Herb. 5916; *Forester* in F.D. Herb. 8119. Lydenburg: Magalieskop, *Kotze* in F.D. Herb. 2816. Barberton: Summit Rimers Creek Gorge, *Galpin* 1115.



FIG. 1.—*Schrebera alata* (Hochst.) Welw. from Graskop, Transvaal. Branchlets glabrous but branches of the inflorescence and calyces puberulous; wings on petiole and rhachis not obvious on drawing; *a*, dehiscent capsule; *b*, seeds.

NATAL.—Ingwavuma: *Codd* 7034. Ubombo: *Gerstner* 4551 (leafy specimen, wings broad). Eshowe: *Lawn* 863 (NH). Mapumulo: Nonoti, *Medley Wood* 10366. Inanda: Tongaat, *McKen* 17 (NH); Inanda, *Medley Wood* 819 (NH). Durban: *Gerrard* 1153 (type no. of *S. saundersiae* Harv.); *Medley Wood* 11839; *Medley Wood* 12016 (NH); Berea, *Medley Wood* 5201 (type no. of *S. latialata* Gilg); *Medley Wood* 11042 (L). Umlazi: Umlaas, *Maurice & Evans* 329 (mixed sheet, centre *S. argyrotricha*) (NH). Camperdown: between Drummond & Inchanga, *Butcher* in NH. 17694.

Also found northwards to Angola and Abyssinia.

Morphological variation in this genus makes the definition of its species very difficult and as it becomes better known in Africa the tendency is to return to a broad view of the species. Turrill in "Flora of Tropical East Africa", 1952, takes this broad view and sinks under *S. alata* (Hochst.) Welw. the following East African species: *S. obliquifoliolata* Gilg, *S. merkeri* Lingelsh. and *S. nyassae* Lingelsh. Under this treatment *S. saundersiae* Harv. from Natal must be sunk under it too and in fact, as far back as 1869 when Welwitsch made the combination "*Schrebera alata*" for *Nathusia alata* Hochst., he was of the opinion that *S. saundersiae* Harv. was conspecific with Hochstetter's Abyssinian plant and his own specimens from Angola, and cited all these specimens under the name *Schrebera alata* (Hochst.) Welw. Gilg, however, resuscitated it and described several new species, most of which are now again sunk. With its capacity to vary in size, shape, and texture of leaves and the degree to which the rachis is winged one may find specimens from neighbouring trees appearing very different, sometimes more so than a specimen from Abyssinia and one from Natal.

Among Gilg's species is *Schrebera latialata*, the type being a Medley Wood specimen from Berea, Durban, that is from the same area as *S. saundersiae* Harv. The characters which distinguish Gilg's species, for instance the broad wings on the petiole, have been proved to vary from season to season, probably according to the rains and the amount of shade the plant gets, and it can therefore not be upheld and goes, with *S. saundersiae*, into the synonymy of *S. alata*.

The species is distinguished from *S. argyrotricha* Gilg mainly by the glabrous or glabrescent branchlets (not densely tomentulose); glabrous leaves; branches of the inflorescence and calyx being evenly puberulous; and the rather open, not compact, cymes. In some cases it may be difficult to distinguish between these species and the suggestion that the differences are not specific may present itself. But the difference in the pubescence is not merely one of degree but a different type of pubescence. In *S. alata* the new growth is glabrous or puberulous, never silvery tomentulose, and the branches of the inflorescence are puberulous and the calyx densely and persistently so, whereas in *S. argyrotricha* the branches of the inflorescence are silvery tomentulose while the calyx sometimes becomes quite smooth, especially in the upper half. In this latter species one often finds a smooth calyx and silvery pubescent pedicel while in *S. alata* this is never the case, the pedicel and calyx being evenly puberulous. *S. alata* is usually a bigger tree with rather larger leaves and more open inflorescence. It is found only in forest or on the fringes of forests in mountainous country and in the south in the coastal bush of Natal.

2. *Schrebera argyrotricha* Gilg in Bot. Jb. 30: 74 (1901); Wright in Fl. Cap. 4, 1: 483 (1907); *S. gilgiana* Lingelsh. in Pflanzenr. 72: 108 (1920); *S. mazoensis* Sp. Moore in J. Bot. Lond. 45: 48 (1907).

Small trees (or shrubs) in dry bushveld, often with a short main stem about 3 feet long, and several long erect smooth branches, but sometimes trees about 18 feet tall; young branchlets grey or silvery tomentulose. Leaves 3-5-foliolate, 4-10 cm. long, grey green in effect owing to the pale ashy pubescence which is persistent in western area plants, while those from eastern regions are glabrescent; leaflets variable in shape and size, the lateral from 1.5-7.5 cm. long and .8-3.5 cm. broad, usually very broadly elliptic-oblong, the terminal subsessile, slightly larger, more or less obovate

and shortly cuneate at the base, upper surfaces slightly darker than the lower, both surfaces pubescent or (in eastern regions) glabrous; petiole and rhachis narrowly to broadly winged, variously auricled at or near the base or without auricles. *Inflorescence* tomentulose, 2–7 cm. long, cymes compact; bracts deciduous, variable in size, lower up to 1 cm. long, 9 mm. broad, upper usually 5 mm. long and 3 mm. broad, innermost narrower, more or less spatulate. *Calyx* silvery pubescent to glabrescent outside, smooth at least in top half, minutely puberulous on upper portion within, tubular-turbinate, truncate, slit or shallowly lobed, persistent in fruit. *Corolla* sweetly scented, white suffused with pink or puce at different stages; tube cylindrical, smooth outside and with a few long hairs about the centre within, about 1 cm. long; lobes often 7, spreading abruptly to slightly reflexed, about 4–5 mm. long and 3.5–4.5 mm. broad, irregularly crenate on the margins with a cluster of glandular reddish brown hairs near the base on inner face. *Stamens* 2, heterostylus, inserted near the apex of the tube and then exerted or, in other specimens, below the apex and then included. *Ovary* 2-celled, about 1.5 mm. long, subtruncate and obscurely 2-lobed at the apex, very shortly pubescent on top; style about 1 cm. long, usually glabrous; stigma long exerted in flowers with stamens included and vice versa, bifid, lobes about 1.5 mm. long, adhering to each other. *Capsule* green and pubescent when young (turning black on drying), light brown at maturity, oblong obovoid slightly laterally flattened, with a ridge along the septum. *Seeds* about 7 mm. long, with a subterminal, oblong wing about 9 mm. long and 6 mm. wide, sometimes narrower (wing varies in width and degree in which it runs down one side).

FIG. 2.

Type: Wilms 201, Lydenburg. Types of synonyms: *S. mazoensis* Sp. Moore, Eyles 202, S. Rhodesia; *S. gilgiana* Lingelsh., syntypes, Marloth 3403, S. Rhodesia, Rehmann 5950, Transvaal, Landauer 150, Natal.

TRANSVAAL.—Soutpansberg: Machava, Acocks 8861; Elim, Botha 2 (two gatherings) and in F.D. Herb. 10735. Pietersburg: Blaauwberg Smuts and Pole Evans 919 (small leaves, 3-foliolate); Bremekamp and Schweickerdt 113, (leaves small); Codd 8676 (leaves large, 3–5-foliolate); Codd and Dyer 9178 and 9120 (small leaves). Letaba: Houtbos, Rehmann 5950, syntype of *S. gilgiana* (Bol); Modjadjies Reserve, Krige 206. Waterberg: Palala Heights, Meeuse 9638; near Naboomspruit, Vischgat, Galpin 8855; Nylstroom hills, Mogg s.n. and in Moss Herb. Wits. 26475; near Warmbaths, Smuts s.n.; Codd 2961; Marais 268; 269; Verdoorn 2400; 2401; 2402 (coppice shoots); 2403 (after flowering). Pilgrims Rest: Graskop, Lothian Reserve, Joubert in F.D. Herb. 8720; near Leydsdorp, Stapelton in F.D. Herb. 8462. Lydenburg: Waterfall (type locality), du Plessis 1; 2; 3; Marais 63; 64; 66; Verdoorn and Codd 7614; 7615; 7618; Penge Mine, Codd and Dyer 7755; Buffelsvlei, Story 4076. Nelspruit: near Pretorius Kop, Codd 6053; Codd and de Winter 4883; Acocks 16620; v. d. Schyff 169; Shabin, v. d. Schyff 1469 (glabrous); Klokwene, v. d. Schyff 181; Skukuza, Cholmondeley s.n.; near Nelspruit, Mogg s.n.; Plaston, Holt 303 (NH); Junction Nels and Corodile Riv., Liebenberg 2621. Barberton: Thorncroft 606 (NH); Williams in Tvl. Mus. 10447; Thorncroft 606 (NH); Roses Creek, Mathews 144.

SWAZILAND.—Mohlangotsha Mtn., Mankiana, Miller S/267.

NATAL.—Nkandhla, Insuzi Gorge, Acocks 12730; Mapumula: Monoti, Medley Wood 8789 (NH).

Also occurs in S. Rhodesia and Portuguese East Africa (possibly also in Tanganyika for Turrill in F.T.E.A. cites a specimen which he names *S. mazoensis* from Kondoa, T.T.).



FIG. 2.—*Schrebera argyrotricha* Gilg., from the waterfall, Lydenburg. Branchlets and branches of the inflorescence tomentulose, calyces glabrescent in parts; *a*, dehiscent capsule; *b*, seeds.

Two ecotypes are found in this species, the specimens from the western and central areas being densely and persistently silvery tomentulose while those in the eastern regions have a tendency to glabrescence in parts. In these eastern specimens the calyces are often quite smooth while the pedicels and the rest of the inflorescence are silvery tomentulose; the leaves may be glabrous but new growth usually has the characteristic tomentulose pubescence. By a strange coincidence the two ecotypes, the western and eastern forms both occur at the type locality of *S. argyrotricha*, the Waterfall near Lydenburg. Through a personal visit to that locality the error of considering these forms as distinct species was avoided. The Waterberg and Rhodesian specimens with the conspicuous tomentulose twigs had been taken to be *S. mazoensis* while specimens with smooth calyces and less hairy leaves were named *S. argyrotricha*. On the visit to the Waterfall where Wilms collected the type specimen described as having a glabrescent calyx, specimens of *Schrebera* were found to be quite plentiful. Those growing in exposed positions were as densely and persistently tomentulose as the specimens in the Waterberg and *S. Rhodesia*, while others, sometimes only a few yards away, but growing in the shade of the cliff, had smooth calyces and more or less glabrous

leaves. Further examination of specimens from Rhodesia, Transvaal, Swaziland and Natal supported the view that they belong to one species but occur in the two forms described.

As in *S. alata* so in this species there is a great deal of variation in the size, texture and shape of the leaflets, in their number, 3 or 5, and the degree to which the rachis is winged and auricled. For this reason *S. gilgiana* Lingelsh. can hardly be maintained on the small size of the leaflets since the measurements fall within the range of size of our species. The 3 specimens cited come from 3 distant localities, Rhodesia, Transvaal and Natal but also well within the range of distribution of *S. argyrotricha*. To illustrate the unreliability of leaf size, two specimens in the National Herbarium from the Blaauwberg, collected at different times, both had small 3-foliolate leaves. In a recent expedition to that remote spot the botanist was asked to look out for this *Schrebera* and material was brought back with the normal sized leaflets and most of the leaves 5-foliolate.

Notes that may assist in distinguishing this species from *S. alata* are given under the latter species.

Among the tropical species *S. argyrotricha* is most like the description of *S. tomentella* (Welw.) Gilg which however has larger leaves, outside the range of variation in size of our species.

Another tropical species, *S. greenwayi* Turrill, is very like the eastern form of *S. argyrotricha*, having almost glabrous leaves and the calyx smooth in part in contrast to the pubescent pedicel but in this case the tomentum on the new growth may be considered to differ in some respect from that of our species.

2. JASMINUM.

Linn., Gen. Pl., ed. 5: 7 (1754); Harv. ex Wright in Fl. Cap. 4, 1: 479 (1906); Phill. Gen. S.A. Fl. Plants ed. 2: 571 (1951).

Climbing, scrambling or erect shrubs or shrublets. *Leaves* compound or reduced to one leaflet, digitately or pinnately 3 or more foliolate, usually opposite. *Inflorescence* consisting of a solitary flower or a few flowered simple or compound cyme, terminal on main and lateral branchlets, sometimes axillary as well. *Flowers* white or yellow, sometimes flushed with rose, sweetly scented. *Calyx-tube* campanulate, lobes 4-13, often long and subulate. *Corolla-tube* long and slender, lobes 4-11, imbricate, spreading abruptly. *Stamens* 2, inserted near the top of the tube, not exerted; filaments short. *Ovary* 2-locular with 2, rarely more, ovules in each loculus, attached near the base; usually only one ovule developing; style slender; stigma clavate or bi-lobed. *Fruit* a berry, deeply bi-lobed, usually one lobe aborting.

Type species: *J. officinale* L., India.

Under the common name "Jasmine" this genus is largely grown in gardens as an ornamental plant. At least two of our species are frequently found in cultivation, *J. multipartitum* and *J. angulare*.

Among a number of Indian species found in South African gardens there is one, identified here as *J. multiflorum* (Burm.) Andr.,* which seems to have become naturalised along the Umgeni River near Durban and possibly also in Barberton where it is frequently grown as a hedge. *J. multiflorum* is easily distinguished from the indigenous species by the ovate-cordate leaves which are mostly over 3.5 cm. long and 2.5 cm. broad and by the densely hirsute-tomentose twigs, pedicels and calyces including the long subulate calyx-lobes.

* *J. multiflorum* (Burm.) Andr. = *J. pubescens* Willd. and *J. hirsutum* Willd. pro. parte non *N. hirsuta* L. (see Andr. Bot. Rep. t. 496 and B.M. 1991).

Another tropical Asian species which is quite commonly cultivated and which, when dried and pressed, may be confused with a S. African species is *J. humile* L. It has angled stems like our *J. angulare* and the calyx lobes are similar; although the leaves in the S. African species, *J. angulare*, may be pinnate occasionally they are constantly, or more commonly so, in *J. humile*. The growing plant, when in flower, could not be confused with our plant because the flowers are yellow instead of white.

A specimen in the Albany Museum Schonland 945 named *J. angulare*, is rather *J. humile*, and must have been found in cultivation or it may have been an escape.

Key to Species.

Leaves compound, 3-5-7-foliolate:

- Leaves usually digitately 5-7-foliolate, sometimes 3-foliolate but then specimens from the Transvaal; leaflets more than twice as long as broad; shrublets about 1½ feet tall..... 1. *J. quinatum*.
- Leaves usually 3-foliolate, sometimes some pinnately 5-foliolate; shrubs, twiners or scramblers:
 - Leaves narrowly linear-lanceolate to linear-oblong, more than twice as long as broad, glabrous and without acarodomatia, only petioles pubescent..... 2. *J. tortuosum*.
 - Leaves ovate to oblong, seldom up to twice as long as broad:
 - Inflorescence fairly compact; petioles sub-erect; leaves (on pressed specimens) covering the base of the flowers, occasionally pinnately 5-foliolate..... 3. *J. angulare*.
 - Inflorescence of broad lax cymes, usually broader than long; petioles spreading; leaves (on pressed specimens) not covering the base of the flowers:
 - Inflorescence terminal and axillary only in upper leaves; acarodomatia, if present, in axils of lower veins only; leaflets usually under 5 cm. long; calyx small, under 2 mm. long..... 4. *J. fluminense*.
 - Inflorescence terminal and axillary; acarodomatia in axils of central and upper veins also; leaflets usually over 5 cm. long; calyx usually over 2 mm. long.... 5. *J. abyssinicum*.

Leaves unifoliolate:

- Calyx-lobes much shorter than the tube, very shallow or up to 1.5 mm. long, then thickened and conduplicate, apiculate, but never produced into a subulate upper portion; acarodomatia if present mostly in axils of basal or lower veins; petioles articulate in upper portion..... 6. *J. breviflorum*.
- Calyx-lobes almost as long as to much longer than the tube, subulate at least in upper half, if rather short then leaves with acarodomatia also in axils of upper veins:
 - Whole plant glabrous or inconspicuously puberulous in parts; no acarodomatia:
 - Glabrous plants with lanceolate-elliptic, glaucous leaves usually about 3 times as long as broad; petiole articulate in upper portion; inflorescence normally 3-flowered; restricted to south-western Cape..... 7. *J. glaucum*.
 - Twigs, at least, shortly densely and persistently puberulous; leaves rarely 3 times as long as broad; petiole articulate in lower half; flowers usually single on short pedicels..... 8. *J. multipartitum*.
 - Plants, at least in parts, conspicuously pubescent, either tomentulose or patently pubescent with straight or curled hairs:
 - Pedicels rather short and thick, usually about 5-7 mm. long, densely pubescent; calyx lobes up to 13, subulate, usually definitely longer than the tube; leaves without acarodomatia; twigs more or less tomentulose; petioles articulate, usually in lower half..... 9. *J. stenolobum*.

- Pedicels rather long and slender, sparsely pilose or glabrous; leaves usually with acarodomatia; petioles short, articulate near apex..... 10. *J. streptopus* (aggregate sp.).
- Leaves oblong-elliptic to ovate-oblong mostly 4-7 cm. long; inflorescence usually 3-5-flowered..... 10a. var. *streptopus*.
- Leaves on the whole smaller and ovate-acuminate, mostly 1.5-3.5 cm. long; inflorescence usually 1-flowered..... 10b. var. *transvaalense*.

1. *J. quinatum* Schinz in Vjschr. Naturf. Ges. Zürich. 55: 245 (1910). *J. tortuosum* Harv. ex Wright in Fl. Cap. 4: 482 (1907) partly, as to specimens from Kalahari, non Willd. *J. lupinifolium* Gilg & Schellb. in Bot. Jb. 51: 83 (1914).

Sub-shrubs with erect or straggling stems about 40 cm. long from a creeping rhizome. Twigs ridged or angled, glabrous or thinly to densely pubescent with straight or crisped hairs. Leaves digitately 5-foliolate, sometimes 3-, 4- or 7-foliolate; petiole flattened, 1.5-5 mm. long, rarely up to 12 mm. long; leaflets with the central the largest, 12-40 mm. long, and 2-9 mm. broad, rarely larger, the lateral smaller and the outermost still smaller, glabrous or sparsely to densely pubescent with straight or crisped hairs, linear-lanceolate, lanceolate to ovate-lanceolate, apiculate at the apex, cuneate at the base into a petiolule-like claw, claw varying in length, that of the central leaf usually the longest, up to 5 mm. long, rarely longer. Inflorescence terminal, sometimes also axillary in the upper pair of leaves, cymes 1- to 3-flowered, the terminal and axillary forming what appears to be a sub-corymbose inflorescence; peduncle 0 to 20 mm. long, glabrous or pubescent; pedicels 3-12 mm. long, of some lateral 1-flowered cymes from axils of upper leaves up to 20 mm. long, glabrous or pubescent. Calyx glabrous, tube about 2.5 mm. long, usually 6-toothed, teeth somewhat unequal, 1-2.5 mm. long, rarely up to 3 mm. long, triangular with margins folded inwards, sometimes conduplicate, apiculate, sinuses U-shaped. Corolla white, tube 18-22 mm. long, usually 6-lobed; lobes 10-12 mm. long and about 4 mm. broad. Stamens apiculate, included. Ovary quadrate, about 1.5 mm. long; style 2-lobed, lobes 3 mm. long, eventually exserted. Fruit twin berries, often only 1 developing, globose, about 5 mm. diam.

PLATE 1.

Type: *Schlechter* 3914, Corcodile Riv., Lydenburg. Type of synonym: *J. lupinifolium* Gilg & Schellenb., *Wilms* 924, Lydenburg.

TRANSVAAL.—Pretoria: Hennops River, *Leendertz* in Tvl. Mus. 8174; 8212; Koedoespoort, *Mogg* 11788. Carolina: *Rademacher* in Tvl. Mus. 7473; Waterval Boven, *Rogers* 22639 (NH); 18386 (Tvl. Mus. 2511); *Pole Evans* 2619; Waterval Onder, *Prosser* 1228 (K, PRE); Bergendal, *Galpin* 12365; Steynsdorp, *Dieperink* 30. Belfast: near Draaikraal, *Codd* 8053; Schoenmanskloof, *Young* A355. Lydenburg: *Wilms* 924, syntype of *J. lupinifolium* Gilg and Schellenb. (L); near Corcodile River, *Schlechter* 3914 (type number); Spekboom River, *Young* A455; A456; Secocoeni Land, *Gray* 4186; along Sabi Road, *Smuts and Gillett* 2494; near Lydenburg, *Codd* 5646; 6663; 6664 (hairy form); *Codd and Verdoorn* 7599; Rooidraai, *Liebenberg* 3489; Origstad Valley, *Walters* 10762. Pilgrims Rest: *Rogers* 24260 (GRA). Piet Retief: *Galpin* 9667.

Not known to occur outside the Transvaal.

This species has a superficial resemblance to *J. tortuosum* Willd. of the eastern Cape and Wright, in the Flora Capensis, cites *Wilms* 924 and *Rogers* 2511 from the Transvaal, under *J. tortuosum* whereas both these specimens are *J. quinatum*. The resemblance is in the long narrow leaflets without acarodomatia, but the species are easily distinguished in that the leaves of *J. quinatum* are mostly digitately 5-foliolate

and only occasionally with some leaves 3- or 7-foliolate. Then the habit of the latter is a low shrublet forming a fairly dense growth from a creeping rootstock whereas *J. tortuosum* is a high climber, the slender voluble branchlets probably accounting for the name. Also the area of distribution for these two species is distinct.

In the Botanische Jahrbücher, 1914, Gilg and Schellenberg described *Jasminum lupinifolium* on 3 gatherings of Wilms, among them Wilms 924 which, as mentioned above, was cited by Wright under *J. tortuosum* Willd. From the description, and from the examination of Wilms 924 as represented in the Ryksherbarium, Leiden, it is obvious that this species is the same as *J. quinatum* and being a later homonym must be sunk under *J. quinatum* Schinz. The epithet "lupinifolium" is very apt, for the leaves are reminiscent of those of lupins. Although more often five, the leaflets vary in number from three to seven, the central being the largest with the longest petiolule. They all stand more or less erect and are so crowded on the pressed specimens that it is difficult to distinguish them.

Like in other species in the genus, *J. quinatum* may occur in a completely glabrous, a conspicuously hairy or an intermediate form. It is found on mountain slopes, among rocks on hillsides, in the open, along sandy stream banks and on shaly slopes in open woodland.

2. *J. tortuosum* Willd. Enum. 1: 10 (1809); DC. Prodr. 8: 311 (1844) excl. vars.; Harv. ex. Wright in Fl. Cap. 4, 1: 482 (1907) pro parte; *J. flexile* Jacq. Schoenbr. 4: 46, t. 490 (1804) non Vahl.

Twiner or scrambler with branches angled in parts, the ultimate usually hirsute in parts, hairs white, crisped. Leaves 3-foliolate; petiole hirsute especially along the upper surface, about 5–10 mm., rarely 2 cm. long; blade glabrous and without acarodomatia, 1.7–4 cm. long and .5–1.4 cm. broad (rarely larger 4.5 × 2 cm.); acute or broadly rounded at apex, mucronate, cuneate at base into a petiolule, central petiolule the longest; midrib prominent below and running into the petiolule at the base. Inflorescence glabrous, terminal on the branches and on the lateral branchlets, and axillary in axils of the upper pair of leaves only, 3–5-flowered, peduncle 1–2.5 cm. long; pedicels 1–1.5 cm. long (rarely 2 cm. long). Calyx usually 5-lobed, sometimes 6, 2.5–5.5 mm. long; lobes from much shorter than the tube to about as long as the tube, 1–2.5 mm. long, triangular, acuminate, conduplicate, apiculate, sinuses U-shaped. Corolla white, usually 6-lobed, tube 1.5–2.7 cm. long; lobes up to 1.2 cm. long, 5 mm. broad. Fruit not seen.

PLATES 2 & 3.

Type: *Willdenow* in Berlin-Darlem Herbarium, Cape Province.

CAPE.—Mossel Bay: Grootplaats, *Muir* 2400. Oudtshoorn: Huis Riv. Pass, *Compton* 20327, rather broad leaves (NBG). Caledon: *Elbrecht* in Tvl. Mus. 19010. Somerset West: Gordons Bay, *Parker* 4305. Tulbagh?: *Drege* s.n. (L).

Not known to occur outside the Cape Province.

This species is not well represented and it is possible that the specimens cited are merely variants of *J. angulare*. They agree quite well with the type (see plate 2) and with Jacquin's figure, cited by DC. under *J. tortuosum* Willd., with the exception of *Compton* 20327 which has larger leaves, but agrees in the other characters, such as leaves glabrous, without acarodomatia, and usually more than twice as long as broad.

The 4 specimens from the Cape Province, cited by C. H. Wright in the *Flora Capensis* under *J. tortuosum*, have been examined and they are all *J. angulare*. The specimens cited from the Transvaal are *J. quinatum*, as mentioned in the notes under that species.

The Drege specimen in the Ryksherbarium, Leiden, cited here may be of the same Drege gathering as seen by De Candolle and identified with *J. tortuosum* Willd. (DC. Prodr. 8: 311). A photograph of the Leiden specimen is reproduced here, on the right-hand side of plate 3. As may be seen from a comparison of plates 2 and 3, it compares well with the type of the species.

3. *J. angulare* Vahl Symb. 3: 1 (1794); Willd. Sp. Pl. 38 (1797); Hooker in Bot. Mag. t. 6865 (1886); Harv. ex Wright in Fl. Cap. 4, 1: 481 (1907) excl. Burt Davy 360. *J. capense* Thb. Prod. 2 (1794–1800); Thb. Fl. Cap. Ed. 1: 4 (1807–13). *J. angulare* var. *glabratum* E. Mey. Comm. 1 fasc. 2: 14 (1837); DC. Prodr. 8: 311 (1844). *J. natalense* Gilg. and Schellenb. in Bot. Jb. 51: 86 (1914) in part, excluding Schlechter 11749 from Komati Poort.

Shrub, usually scrambling or climbing, sometimes climbing up to 20 feet high in trees. Ultimate branchlets 4–30 cm. long, angled (at least in parts), angles ridged, glabrous to variously pubescent from thinly so to tomentulous and densely pubescent with crisped hairs. Leaves 3-foliolate, or occasionally a few pinnately 5-foliolate; petioles usually ascending, rarely patently spreading, 0.4–2 cm. long, glabrous, thinly pubescent or tomentulose; leaflets glabrous, thinly pubescent or tomentulose on both surfaces, acarodomatia often present on under surface in axils of lower veins, usually broadly ovate, sometimes oblong, variable in shape, with apex acute, mucronate or rounded, the terminal 1.3–4.5 cm. long and 0.6–2.5 cm. broad, with a petiolule 3–2 cm. long, rarely lobed at the base, but when deeply lobed forming a pinnately 5-foliolate leaf; lateral leaflets usually distinctly smaller than the terminal with a petiolule 2–6 mm. long, sometimes longer. Inflorescence of 1 or 2 terminal, rather compact cymes (the leaves in pressed specimens usually concealing the base of the inflorescence), pedicels of lateral flowers about 1–2 cm. long, usually glabrous, sometimes thinly pubescent or rarely densely so. Calyx campanulate, usually glabrous, tube 2.5–3 mm. long, 7-toothed, teeth about 1.5 mm. long, varying in size. Corolla white, usually greenish outside (rarely pink, fide Galpin); tube 1.7–3.5 cm. long; lobes 5, about 1–1.5 cm. long, 6–7 mm. broad; stamens inserted in upper portion of tube, included filaments 2 mm. long, anthers 2.5 mm. long, distinctly apiculate, apicule 1 mm. long. Ovary brown, 1.5 mm. long, style ultimately exerted, 2-lobed, lobes about 5 mm. long. Fruit a globose berry, often in pairs, about 7 mm. diam.

PLATE 4.

Type: Drege s.n., Cape Province. Types of synonyms: *J. capense* Thb., Thunberg s.n., Zeeko Riv., Uitenhage; *J. natalense* Gilg & Schellenb., syntypes, Wood 940, Weenen, Kuntze s.n., Ladysmith, Bachmann 1029, and Beyrich 77, Pondoland (Schlechter 11749 is *J. fluminense*).

TRANSVAAL.—Volksrust: Jenkins in Tvl. Mus. 9300.

NATAL.—Utrecht: Wahl in Tvl. Mus. 15388, some leaves 5-foliolate. Newcastle: Charlestown, Medley Wood 5166, 1 leaf 5-foliolate. Dundee: Blesboklaagte, Codd 2412. Nqutu: Codd 7666. Bergville: Oliviers Hoek Pass, Medley Wood 3515 (K, NH); Upper Tugela, Gillett 1146. Klip River: Ladysmith, Acocks 9987, some leaves 5-foliolate. Estcourt: West 1844 (specimen with fruits, leaves very small); Acocks 9939, some leaves 5-foliolate; Colenso, Hutchinson 1861; Mooi River, Mogg 7218, 5-foliolate leaf. Nkandhla: Qudeni Gerstner 2629 (NH). Pietermaritzburg; Scottsville, Fisher 701 (superficially looks like *J. fluminense*); Umsindusi River, F.G.C. 669. Harding: Oliver 97 (NH). Umzinto: Dumisa, Campbelltown, Rudatis 1860 (L). Without precise locality in Natal: Gerrard & McKen 626 (NH); Tintern, Maurice & Evans 501 (NH); Cooper 1166 (K, BOL); Gerrard 280 (K).

O.F.S.—Without precise locality, Cooper 2704 (K).

CAPE.—Port St. Johns: *Hutchinson* 1778. Umzimkulu: Clydesdale, *Tyson* 2017. also at (K). Kentani: *Pegler* 1810, 1200, 605 (BOL); 2103 (BOL). Butterworth: *Hector* 993 (L). Queenstown: Gwatyn, *Galpin* 8267. Stockenström: Barker 2901 (NBG); Katberg, *Sole* 400. Komgha: *Flanagan*, 858; *Medley Wood* 5166 (SAM), East London: *Wood* 3390; *Smith* 3645; 3667; *Breyer* in Tvl. Mus. 16542; *Barker* 1415 (NBG); *Ratray* 184, rather small calyx (GRA); *Hilner* 139 (GRA); Vincent *Barker* 3512 (NBG). Stutterheim: *Rogers* 12703. Keiskama Hoek: *Story* 2500. Mkubiso Forest, *Stayner* 30 (GRA). King William's Town: *Tyson* 2150; 2887 (SAM); *Compton* 19345 (NBG); Kei Road, *Rogers* 3209 (GRA); Tamache Heights, *Leighton* 2645, 2830. Peddie: *Leighton* 2645 (BOL), near Keiskama River, *Galpin* 7691; Breakfast Vlei, *Taylor* 1715. Bedford: *Acocks* 17633; Hutton s.n. cited in Fl. Cap. under *J. tortuosum* (K); *Theron* 579. Victoria East: near Fort Hare, Alice, *Grand and Blenkiron* 2705; Hogsback, *Ratray* 356 (GRA). Albany: *Cooper* 2712 (K); *Rogers* 2782; Blaauwkrantz Bridge, *Galpin* 266; Fish River, *Marloth* 10869; Oaklands Park, *Galpin* 281; Botha's Hill, *Rogers* 3408 (SAM); Grahamstown, *Britten* 1560 (GRA). Port Alfred: *Tyson* in Govt. Herb. PRE. 12990; *Hutton* s.n. (GRA); Salisbury s.n. (GRA). Somerset East: *Zuurberg, Holland* 303; *Compton* 20276 (NBG); *Boschberg, MacOwan* 1946, 3 sheets cited in Fl. Cap. under *J. tortuosum* (SAM); Alexandria: *Copeman* 84. Uitenhage: Sunday Riv., *Gill* s.n. (K); *Aloes, Drege* 3146; *Prior* s.n. Zwartkops River, E. & Z. s.n.; 496 (BOL); 231, cited in Fl. Cap. (K, SAM); 3372 (SAM); *Addo, Drege* b (K, L); *Drege* B. b (L); *Wilman* Bol. Herb. 25407 (BOL); *Enon, Thode* A 2699; A 2698; *Drege* B. a., type gathering of var. *glabratum* E. Mey (K, L); between Enon and Zuurberg, *Drege* a, (K, L). Port Elizabeth: *West* 18 (K, GRA); St. George's Strand, *Long* 852; Redhouse, *Paterson* 240 (GRA); *I. L. Drege* 113 (GRA); *Long* 853 (GRA); Algoa Bay, *Cooper* 2702 (K); Kabeljous River, *Bolus* 1667, cited under *J. tortuosum* in Fl. Cap. (K, BOL). Ladismith: Suar Mts. *Liebenberg* 703. Without precise locality in Cape Province: *Castelnau* 462; E. & Z. s.n. (GRA); *Barber* 23 (GRA); E. & Z. 286 (L); *Ecklon* s.n. (L); E. & Z. s.n. (L); British Kaffraria, *Hutton* s.n., cited in Fl. Cap. under *J. tortuosum* (K).

Not known to occur outside South Africa.

J. angulare Vahl and *J. capense* Thb. are synonymous and since both were published during 1794, and more exact dates cannot be found for the publications, the author who first cites one of these as a synonym of the other must be followed (International Rules, Art. 67). Willdenow in 1797 cited *J. capense* as a synonym of *J. angulare*: therefore, of these two the latter, *J. angulare* Vahl, is the correct name.

With regard to the pubescence, in this species some of the plants are completely glabrous or appear glabrous with sparse pubescence in parts while others are conspicuously tomentulose. The examination of a range of material shows that the tomentulose specimens are not restricted to any particular region and that in some places both pubescent and glabrous forms occur near each other, such as two collections of Thode at Enon., A 2699 (glabrous) and A 2698 (tomentulose), and *Drege* B. b and b from Addo. It was found too that in some cases on the same specimen both glabrous and tomentulose twigs occurred. On this account a species or variety separated from *J. angulare* on the presence or absence of pubescence cannot be maintained. This applies to *J. natalense* Gilg & Schellb. and *J. angulare* var. *glabratum* E. Mey. Gilg and Schellenberg write of *J. angulare* var. *glabratum* E. Mey. (*vide* Bot. Jb. 51: 84, 1914) that since the type in Vahl's herbarium in Copenhagen is glabrous this variety must be dropped. Making no reference to Vahl's original description which gives the branchlets as villose, they then proceed to describe *J. natalense* (l.c. page 86) to take the distinctly pubescent specimens. Although the cited specimens from Natal and Pondoland have not been seen, judging from the description and several specimens from the same locality there can be no doubt that they are *J. angulare* in the broad sense as here defined. (The specimen cited from the Transvaal, *Schlechter* 11749, is *J. fluminense*).

J. angulare is characterised by the angled branchlets seen best in the glabrous specimens, the terminal rather compact cymes with fairly long pedicels to the lateral flowers, and the calyx usually 3 mm. or more long. The leaves are 3-foliolate with an occasional pinnately 5-foliolate leaf, and the leaflets are usually ovate with acarodomatia on the under surface in the axils of the lower veins. In the pinnately 5-foliolate leaves this species resembles the tropical african species, *J. goetzianum* Gilg, but in this latter species the leaves are normally pinnate and the inflorescence lateral as well as terminal. *J. angulare* has been collected among boulders on hill sides, near rivers, in scrub and scrub forest, and in coastal bush. The flowering time is from October to January.

4. *J. fluminense* Vell. Fl. Flumin. 10 (1825); op. cit. Atl. 1. t. 23 (1827); Dandy in Kew Bull. 1950, p. 368 (1951); Turrill in F.T.E.A. p. 19 (1952). *J. mauritianum* Boj. ex DC. Prod. 8: 310 (1844); Harv. ex Wright in Fl. Cap. 4, 1: 482 (1907). *J. schroeterianum* Schinz Verh. Bot. Brand. 30: 256 (1888).

Woody climber or scrambler, sometimes shrubby. Ultimate branchlets usually long, 10–20 cm. or more, densely shaggily pubescent to rather thinly tomentose sometimes partly glabrescent. Leaves 3-foliolate; petioles patently spreading with apex only upturned, 0.5–2.2 cm. long, usually densely pubescent, rarely partly glabrescent; leaflets densely to sparsely pubescent on both surfaces sometimes sub-glabrous, ovate, gradually narrowing to an acute or rounded apex, acarodomatia when present usually in axil of lower veins only, the terminal leaflets about 2.5 to 4.8 cm. long and 1.4–3 cm. broad on a petiolule 1 to 1.9 cm. long, lateral markedly smaller with petiolule 3–10 mm. long. Inflorescence terminal and axillary in the upper leaflets only, together forming a broad cymose panicle, branches of the inflorescence densely pubescent with crisped hairs; pedicels 1.5–6 mm. long, similarly pubescent. Calyx shortly campanulate, pubescent like the pedicels or sub-glabrescent, 1.5–2 mm. long with 5–6 teeth or lobes, up to 1 mm. long, often smaller or almost obsolete. Corolla white, fragrant, tube 1.5–2.5 cm. long, lobes 6–8, about 1.2 cm. long, 5 mm. broad. Stamens inserted in upper half; filaments about 1.5 mm. long; anthers 4.5 mm. long, acute at apex not reaching the mouth of the corolla tube. Style 2, lobed at apex, lobes subexserted. Fruit brown to shiny black when mature, globose, about 7 mm. in diameter, often twin berries developing.

PLATE 5.

Type: A specimen from Santa Cruz, Brazil, where it had been introduced and was already established in 1825. Types of synonyms: *J. mauritianum*, (specimen?), Mauritius; *J. schroeterianum* Schinz, Schinz s.n., South West Africa.

SOUTH WEST AFRICA.—Kaokoveld: Kunene River, Hall 460 (NBG). Ovamboland: Omupande, Rautenen 790 (K); Okavango, van Dam s.n. (NBG); Lugard 230 (GRA). Oshikango: Loeb 291. Caprivi Strip: Curson 1024. Ngamiland: Curson 806, 144, 343.

BECHUANALAND.—Maun: Van Son in Tvl. Mus. 28959; Kahako, Schoenfelder S138; near Kachikau, Erens 382.

TRANSVAAL.—Soutpansberg: Chipese, Verdoorn 2013; Lam and Meeuse 4894; Dongola, Dyer 4311; Waterpoort, Moss 5311 (J); Fogwells, Smuts and Gillett 3134; Mpefu, Smuts 2043; Maslangani, Breyer in Tvl. Mus. 16031; Elim, Obermeyer 29254; Messina, Rogers 18737; Griffin Mine, Breyer 15630. Pietersburg: Mokeetsi, Reynolds 113; Blaauwberg, Smuts and Pole Evans 940; Codd 8706; Chuniespoort, Maguire 22049. Piet Potgietersrust: Magalakwin River Drift, Hutchinson 2665. Letaba: Gravelotte, Galpin 13522; Selati Railway, Rogers in Tvl. Mus. 12985. Carolina: Waterval Onder, Rogers 422 (GRA). Pilgrims Rest: Newington, Pole Evans H. 18889. Nelspruit; Crocodilepoort, Dyke 5391, near Skukuza, Letty 46; Johnson 449 (NBG); v. d. schijff 847; Pretorius Kop, v. d. Schijff 4; 492; Codd

5085; 5655. Barberton: Kaapmuiden, *Mogg* s.n.; *Rogers* in Tvl. Mus. 24290; Boulder Siding, *Mogg* s.n.; Komatipoort, *Schlechter* 11749 (cited in original description under *J. natalense* Gilg and Schellenb.); *Leendertz* in Tvl. Mus. 2601; *Rogers* in Tvl. Mus. 2601; 19352; *Rogers* 22202; 2677 (GRA); Komati Falls, *Burt Davy* 360, cited in Fl. Cap. under *J. angulare*, (K); Lomati River, *Jenkins* in Tvl. Mus. 9919; Crocodile River Drift, *Bolus* 7848, cited in Fl. Cap. (BOL); Highlands Creek, *Moss* 10702.

SWAZILAND.—Mbabane: near Bremersdorp, *Compton* 19726 (NBG). Asoko: *Dohse* 210.

NATAL.—Ingwavuma: *Gerstner* 4002 (NH); *Codd* 2082; *Ward* 2003.

Also occurs northwards to Nigeria, Abyssinia and Eritrea, in Mauritius, the Seychelles and Arabia; naturalised in the West Indies and S. America.

Until quite recently this species was generally known in Africa, Asia and the Mascarenes as *J. mauritianum* Boj. In the Kew Bulletin 1950 (published 1951) Dandy pointed out that this name is antedated by *J. fluminense* which Velloso had described in 1825. His specimen was from Brazil where the tropical African species had established itself.

This species, which is so common and widely distributed in Africa, is recognised by the following combination of characters: petioles patently spreading with the apex only upturned; petiolules of lateral leaflets 3–10 mm. long, of terminal longer; acarodomatia, if present, in axils of basal or lower veins only; inflorescence terminal and in axils of upper leaves, often forming a broad, more or less flat-topped cymose panicle; pedicels comparatively short and the calyx tube small, under 2 mm. long, with short or almost obsolete teeth. On the whole the pubescence is fairly characteristic being rather dense and of crisped hairs covering even, or especially, the branches of the inflorescence, but this character can be misleading as some specimens, especially in the eastern regions, are glabrescent and occasionally a specimen of *J. angulare* is found with a similar pubescence.

These two species, *J. fluminense* and *J. angulare*, are closely related and are best distinguished from each other by the very small calyx of *J. fluminense*, usually not over 2 mm. long, its broad inflorescence borne clear of the leaves, and short pedicels. The distribution is distinct, *J. fluminense* being a tropical species reaching only as far south as the north-eastern Transvaal and northern Zululand (Ingwavuma) whereas *J. angulare* occurs commonly in the Cape and as far North as Volksrust in the Transvaal and Utrecht in Natal. Evidently Gilg and Schellenberg confused these species because, when describing *J. natalense* (the pubescent form of *J. angulare*, see note under that species) in the Jahrbucher 1914 they cited also *Schlechter* 11749 from Komati Poort which is definitely *J. fluminense*. In the same way Wright in the Flora Capensis cited *Burt Davy* 360 from Komatipoort under *J. angulare* and it too is *J. fluminense*.

Turrill in the Flora of Tropical East Africa, page 21 (1952), divides *J. fluminense* into subspecies and varieties. It has not been found possible in practise to uphold these. From the description, *J. schroeterianum* Schinz is also a synonym of *J. fluminense*. This is supported by a specimen named "*J. schroeterianum* = *J. mauritianum*", at Kew, *Rautanen* 790, which is obviously *J. fluminense* as here defined. With regard to the affinity of *J. fluminense* with another tropical species, *J. abyssinicum*, see the notes under this latter species.

In South Africa, *J. fluminense* is found along rivers or in watercourses in dry country, scrambling over small bushes or climbing in trees on wooded slopes in the lowveld.

5. *J. abyssinicum* (*Hochst.* ex) *DC.*, Prodr. 8: 311 (1844); *Bak.* in Fl. Trop. Afr. 4: 11 (1902); *Gilg & Schellenb.* in Bot. Jb. 51: 84 (1913); *Turrill* in F. T. E. A. 18 (1952). *J. wylliei* *N.E. Br.* in Kew Bull. 1909 p. 419.

Shrub, usually with profuse and high climbing branches, ultimate branchlets long, terete, ascending. *Leaves* 3-foliolate; petioles patently spreading with apex only ascending, 1.5–3.3 cm. long; petiolules of lateral leaflets 1–6 mm. long, of the terminal 10–20 mm. long; leaflets broadly ovate to orbicular-ovate, often shortly acuminate at the apex, the terminal usually 2.5–7.5 cm. long and 2–4.5 cm. broad, glabrous (in South African specimens), acarodomatia, when present, in axils of central and upper as well as basal veins on the lower surface. *Inflorescence* terminal and lateral in the axils of the leaves, cymose-paniculate, lax (in South African specimens), the branches minutely puberulous; pedicels varying in length on the same inflorescence, from 4 mm. (in terminal flowers) to 15 mm. (on lateral flowers), puberulous. *Calyx* campanulate, puberulous, about 3 mm. long, shortly 5–6-toothed; teeth .5–1 mm. long with wide sinuses between. *Corolla* white, suffused reddish purple without; tube about 2.2 cm. long; lobes 5–6, about 1 cm. long and 6 mm. broad. *Stamens* inserted in upper half of the corolla tube; filaments 1.5 mm. long; anthers included 5 mm. long, apiculate, apicule about 1 mm. long. *Ovary* sub-quadrate, about 1.5 mm. long and broad; style long, terete; stigma 2-lobed, lobes oblong subcylindrical in outline, about 4 mm. long. *Fruit* a twin berry, one often aborting, subglobose, about 1 cm. diam.

PLATE 6.

Type.—*Schimper* 169, Aduwa, Abyssinia. Type of synonym: *J. wyliei* N.E. Br., *Wylie* in Herb. Medley Wood 8860, Nkandhla, Natal.

TRANSVAAL.—Zoutpansberg: Entabini Forest near Louis Trichardt, *Galpin* 9679 (fruiting specimen). Pilgrimsrest: Marieps Kop, *Marsh* s.n.

NATAL.—Nkandhla, *Medley Wood* 8860 (type number of *J. wyliei* N.E. Br.).

Also occurs northwards to Abyssinia and Uganda.

Among the specimens in South African herbaria there are no less than 6 sheets of Medley Wood Herb. No. 8860, the type number of *J. wyliei* N.E. Br. These all agree with the description of *J. abyssinicum* as given by Turrill in his revision of the Oleaceae (Fl. Trop. East Africa, 1952) and compare with several specimens from tropical Africa so named in the National Herbarium. Following Turrill's identification of these tropical African specimens, *J. wyliei* N.E. Br. goes into synonymy. The gap in the distribution can probably be explained by the lack of any extensive collecting in the intervening high forests. This was to some extent proved to be so when, after being requested, an Officer of the Department of Forestry, searching for this species, found it in the forest at Marieps Kop in the north-eastern Transvaal. The material was sent to the National Herbarium in April, 1954 and the specimen is cited above. This material assisted in confirming the tentative identification of a fruiting specimen from a forest near Louis Trichardt, *Galpin* 9679, as belonging to the same species and so another link in the distribution is provided.

J. abyssinicum is usually found in high forest. It is closely related to *J. fluminense*, from which it can be distinguished principally by the slightly larger calyx and the axillary as well as terminal inflorescences. In the South African specimens it can also be distinguished by the usually rather larger leaves which are thinner in texture and glabrous, and the acarodomatia which, when present, occur in the axils of upper as well as basal veins. One or other of these features may occasionally be found in eastern forms of *J. fluminense*, but then the size of the calyx will be decisive, or the shape of the inflorescence, which is more or less flat-topped in *J. fluminense* and rather oval in outline in *J. abyssinicum* (compare plates 5 and 6).

6. *Jasminum breviflorum* Harv. in Wright in Fl. Cap. 4, 1: 480 (1906). *J. gerrardi* Harv. in Wright l.c. (glabrous variant).

Climber, usually rampant, occasionally shrubby. Twigs densely or sparsely pubescent with patent crisped hairs or short stiff hairs, glabrescent. Leaves simple, variable in shape and size, lanceolate-oblong, lanceolate-ovate, ovate to ovate-suborbicular, up to 4.5 cm. long and 2.5 cm. broad, usually smaller, pubescent on both surfaces, especially along the veins beneath, glabrescent in parts, sometimes glabrous; petiole short, up to 3 mm. long, pubescent, articulated at or above the middle, often at the apex, articulation not obvious. Inflorescence terminal on the twigs, usually 3-flowered and often also with solitary flowers in the axils of the upper pair of leaves; pedicels long, up to 1.5 cm. long, densely or thinly pubescent to glabrous. Calyx thinly pubescent, rarely densely, sometimes glabrescent; tube about 3 cm. long; lobes usually 5, very shallow (calyx appearing truncate), or up to 2 cm. long and thickened and conduplicate, usually with recurved apicule but not produced into a subulate erect apical portion. Corolla white, fragrant, tube 1.5–2 cm. long (in eastern Cape up to 3 cm. long); lobes about 7, usually 1–2 cm. long and 2.5–5 mm. broad. Stamens 2, inserted on the tube in upper half, included, filaments very short; anthers about 3.5 mm. long. Ovary about 1 mm. long, truncate, 2-celled with 1 ovule in each; style filiform 1.5 cm. long; stigma lobes 3.5 mm. long, exserted. Fruit a twin berry but usually only one developing, sub-globose, about the size of a large pea turning black when ripe; seed 1, exendospermous.

PLATE 7.

Type: *Burke* s.n., Magaliesberg, near Pretoria. Type of synonym: *J. gerrardi* Harv., *Gerrard* 1477, Nonoti Riv., Mapumula, Natal.

TRANSVAAL.—Waterberg: near Naboomspruit, *Galpin* 494 M.; near Nylstroom, *Repton* 3481; Bremekamp & Schweickerdt 2; Middelfontein Station, *Galpin* 13989; *Mogg* 17557; Warmbaths, *Leendertz* 6542; near Warmbaths, *Bolus* 12113; *Burt* Davy 2182; Thode A1729; N.E. of Thabazimbi, *Codd* 4793. Rustenburg: Nation 346 (BOL); Zwartruggens, *Sutton* 809; near Rustenburg, *Hutchinson* 2933; Buffelspoort, *Turner* 39; Assen, *van Nouhuys* in Tvl. Mus. 31046. Brits: Welgevonden, *Mogg* s.n., Beestkraal, *Jenkins* in Tvl. Mus. 6943. Pretoria: Magaliesberg, *Burke* s.n., holotype (K); Hartebeespoort Nek, *Prosser* 1578; Hamanskraal, *Repton* 3544.

NATAL.—Without precise locality, *Buchanan* 17 (SAM). Dundee: Vants Drift, *Codd* 1517? poor. Msinga: Tugela Ferry, *Galpin* 14789; *Dyer* 4381 poor. Babanango: between Babanango and Entonjaneni, Umhlatuzi Bridge, *Lawn* 2040 (NH). Greytown: Muden Valley, *Galpin* 14737. Eshowe: Nkwaleni Valley, *Lawn* 362 (NH). Mtunzini, near Mtunzini, *Lawn* 1631 (NH). Mapumula: Nonoti, *Gerrard* 1477, holotype (K); *Gerrard & McKen* 1477 (NH). Camperdown: *Rehmann* 7706 (K); *Acocks* 10855; Umlaas Drift, *Medley Wood* 1827, cited in Fl. Cap. under *J. streptopus* (NH). Maritzburg: *Rajah* 4 (NH); nr. Maritzburg on Durban Road, *Compton* 4417 (NBG). Umzinto: Dumisa, St. Mcihael, *Rudatis* 2123 (NH).

CAPE.—Tembuland, on the Kei River, *Bolus* 25405 (BOL). Butterworth: Kei Bridge, *Flanagan* 1204, 1205. Queenstown: Junction Farm, *Galpin* 8145; *Spence* in *Galpin* Herb. 8038. King William's Town: *Galpin* 5912; 5913 (GRA); *Sim* 2724; *Tyson* 2232. Peddie: Keiskamma River, *Sim* 6281; Kaffir Drift, *Compton* 17824 (NBG).

Also found in Portuguese East Africa and may occur in other territories north of South Africa.

Harvey's species, *J. gerrardii* and *J. breviflorum*, were published posthumously by C. H. Wright in the Flora Capensis at the same time, the former from Natal and the latter from the Transvaal. They were classed together on the simple leaves and the short to almost no calyx lobes, and distinguished from one another by the glabrous twigs and leaves of *J. gerrardii*, as opposed to the very pubescent ones of *J. breviflorum*. According to the description these features seemed to be supported by the shape of

the leaf which was described as "ovate-lanceolate, acute at each end", in the Natal species and "ovate, obtuse or acute" in the Transvaal species. An examination of a number of specimens from the Transvaal, Natal and the eastern Cape showed (1) that both leaf-shapes could be found among pubescent specimens as well as among glabrous specimens; (2) although the glabrous specimens mostly came from Natal, their habitat was not different from the pubescent form in that Province; and (3) that no constant supporting feature to that of pubescence could be found. It was also found that some specimens from the eastern Cape were pubescent in part only while on a Flanagan specimen one unattached branch is glabrous and the other pubescent. These species can therefore not both be upheld, not even with one as a sub-species or variety of the other. Since they were published at the same time and, as far as can be ascertained, neither has been sunk before, *J. gerrardii* is here sunk under *J. breviflorum*. The choice of the name to be retained, although it is second in order on the page in *Flora Capensis*, was made because the pubescent variant, *J. breviflorum*, is by far the more common and widely spread.

As the name implies, the flowers are shorter in this species than in most others, but it is not a reliable character since several specimens from the eastern Cape have long flowers. Whether this is a regional variation or whether there is hybridization with the long-flowered eastern Cape species, *J. angulare*, is not known. In spite of the variations, these specimens with the almost truncate to shortly lobed calyces form a recognisable group. The calyx-lobes when present are rather thickened and conduplicate and usually have a recurved apicule, but are never produced into an erect subulate apical portion. The petiole is short and articulate in the upper half.

From description the nearest relative in tropical Africa would be *J. stolzeanum* Knobl. and our species should be compared with it to ascertain the differences. If they are not distinct *J. breviflorum* Harv. in C.H. Wr. takes priority over *J. stolzeanum* Knobl. (1936).

7. *J. glaucum* (L.f.) Ait. Hort. Kew. ed. 1, 1: 9 (1789); Harvey ex Wright in Fl. Cap. 4, 1: 480 (1906), in part, excl. var. *parvifolium* E. Mey. and citations from eastern Cape, Natal and Transvaal. *Nyctanthes glauca* Linn. f. *Suppl.* 82 (1781); *J. ligustrifolium* Lam. *Encycl.* 3: 218 (1789); *J. glaucum* var. *lanceolatum* et var. *latifolium* E. Mey. *Comm.* 1, 2: 13 (1837); DC. in *Prod.* 8: 305 (1844); Harv. ex Wright in Fl. Cap. 4, 1: 481 (1906).

Shrubs rarely scandant, glabrous in all parts. *Leaves* simple, glaucous, usually about 3 times as long as broad, lanceolate, lanceolate-elliptic, lanceolate-ovate, slightly narrowed to a rounded mucronate apex, or acute, sometimes long acuminate, 3-6.5 cm. long, .7-2.5 cm. broad, narrowing gradually to the 3- (or more) nerved base and then abruptly narrowed into a petiolule like basal portion; petiole short, 1-5 mm. long but with the cuneate leaf-base appearing about 1 cm. long, articulate at the apex but articulation often appearing to be about midway depending on the length of the leaf-base. *Inflorescence* terminal on ultimate branchlets, occasionally also in axils of upper pair of leaves, normally 3-flowered; bracts setaceous, usually about 1 cm. long; pedicels 3-12 mm. long. *Calyx* with usually 5-7 subulate lobes; lobes as long as or longer than the tube, sinuses rounded. *Corolla* white, fragrant; tube usually 2-2.5 cm. long; lobes 6-8 in number, 1.7-2.5 cm. long, up to 5 mm. broad. *Fruit* black, a twin berry, one often aborted.

PLATE 8.

Type: *Thunberg*, Langekloof, Caledon*. Types of synonyms: *J. ligustrifolium* Lam. Cape of Good Hope, without precise locality; *J. glaucum* var. *lanceolatum* E. Mey. *Drege*, Olifants Riv., Van Rhynsdorp; var. *latifolium* E. Mey. *Drege*, Clanwilliam.

* Photograph of type in Uppsala herbarium seen since going to press.

CAPE.—Van Rhynsdorp: Ebenezer, *Drege* s.n., cited in Fl. Cap. under “var. lanceolatum E. Mey.”. Clanwilliam: *Drege* s.n. “var. latifolium” (L); 6 miles N.W. of Clanwilliam, *Leipoldt* s.n.; 4451 (BOL); 1 mile N. of Keerom, *Pillans* 8675; near Hex River; *Compton* 18837 (NBG); Pakhuis Pass *Middlemost* s.n. (NBG); beyond Pakhuis Village, *Compton* 4752 (NBG); near Olifantsriver, *Zeyher* s.n. (BOL); Krakadouw Poort, *Esterhuizen* 12269 (BOL). Piquetberg: Piqueniers Kloof, *Dickson* in herb. Bolus 5699 (BOL). Tulbagh (or Worcester?): Witsenberg, *E. & Z.* s.n. (77. 10); Tulbaghkloof, *Zeyher* 1149 (K, PRE). Worcester: Hex River, *Leighton* 2379 (BOL); *Pillans* 5271 (BOL). Paarl: Gt. Drakenstein Mts., *Esterhuizen* 9526; *Wasserfall* 721 (NBG). Caledon: Witwater, *Baur* 8742.

The distribution is limited to the south-western Cape.

It is obvious that this species as treated in the Flora Capensis is a mixture of *J. glaucum* and *J. multipartitum*. The specimens cited there from the south-western Cape, that is from the Tulbagh, Van Rhynsdorp and Clanwilliam districts, answer best to the original description of *J. glaucum* (L. f.) Ait. and form a group easily distinguished from the rest. The group is characterised by the wholly glabrous plants, the glaucous leaves which are usually about 3 times as long as broad, mostly lanceolate-oblong to lanceolate-ovate in shape, and the normally 3-flowered inflorescences.

Among the other specimens cited in the Flora Capensis, that is those from outside the winter rainfall area, Krauss 458 is the type number of *J. multipartitum* Hochst., the very next species described in that work, and *Cooper* 378 and *Galpin* 266 are also *J. multipartitum* Hochst. The other two specimens cited have not been seen, namely *Burchell* 3657 and *Wilms* 925, but, judging from the localities where they were collected they too are in all probability *J. multipartitum*.

The collector's notes, on the herbarium specimens examined, are very meagre; not one mentions the habit of the plant or the glaucous leaves. Thunberg, the collector of the type specimen, is quoted by Lindley in the Botanical Register t. 2013 (1837) as saying that it, meaning *J. glaucum*, is “as high as a man in Lange Kloof (Caledon) by the great stream called Zonder End and in the neighbourhood of the Brederiver”. The plate, however, does not convincingly depict *J. glaucum*. It seems rather to be one of the rare 3-flowered specimens of *J. multipartitum*.

8. *J. multipartitum* Hochst. in Flora 27, 2: 825 (1844); De Wildeman, Ic. Sel. Hort. Hen. 4 t. 134 (1903); Wood and Evans in Natal Plants 4, Pl. 328 (1906); Harv. ex Wright in Fl. Cap. 4, 1: 480 (1906); *J. glaucum* Harv. ex Wright l.c. pro parte, non Ait.; *J. glaucum* var. *parvifolium* E. Mey. Comm. 1, 2: 173 (1837); DC. Prodr. 8: 305 (1844).

Shrub 18 inches to 9 feet tall, sometimes scandent, twiggy. Twigs puberulous, usually short about 2 cm. long. Leaves simple, usually glabrous, suberect, shining, green, often drying blackish and brittle, very variable in size and shape, sometimes aborted or very small on the flowering twigs, oblong, ovate-oblong or ovate-lanceolate, 1.5–3.5 cm. long (usually about 2.5 cm. long) 4–28 mm. broad (usually about 9 mm. broad), rounded or sometimes acuminate and acute at apex, rounded at base and abruptly narrowed into a petiolule-like base; petiole glabrous or minutely puberulous, appearing articulated in the centre or above or below, 1–5 mm. long. Inflorescence terminal on short lateral twigs, usually 1-flowered, rarely 3-flowered; pedicels shorter than the calyx, 1–5 mm. long, glabrous or rarely minutely puberulous. Calyx glabrous or rarely minutely puberulous in parts; tube 2–3 mm. long; lobes 5–9, margins inrolled, appearing subulate with wide sinuses between them, 3–5 mm. long sometimes minutely puberulous at least on margins. Corolla white, pink flushed or lobes dorsally brick red, fragrant; tube 2–3 cm. long; lobes about 11, more or less 1.7 cm. long

and 4 mm. broad. *Stamens* inserted on tube in upper half, included; filaments 1.5 mm. long; anthers 3.5 mm. long, apiculate. *Ovary* 2 mm. long quadrate, truncate; style 2-lobed at apex, eventually exserted, lobes oblong about 2 mm. long. *Fruit* a twin berry joined at base only, but often only one-half developing, oblong to oblong-globose, slightly compressed, about 1-1.5 cm. long, 8-10 mm. broad and 4 mm. thick, green, shiny, turning black when ripe.

PLATE 9.

Type: *Krauss* 458, near the bay, Durban, Natal. Type of synonym: *J. glaucum* var. *parvifolium* E. Mey., *Drege*, Bothasberg, Albany.

TRANSVAAL.—Pietersburg: near Boyne, *Gerstner* 5345 (poor specimen). Potgietersrust: *Leendertz* 6595; 7406; Makapan Valley, B.M. in Moss Herb 22664 (J). Waterberg: Naauwpoort, *Galpin* 133133; Naboomspruit, *Galpin* 13988; near Nylstroom, *Story* 1540; Krantzberg, *Prosser* 1713; near Warmbaths, *Sidey* 1343; Marais 551, 552, 553; near Rooiberg, Sandspruit, *Forssman* 262. Lydenburg: Sekukuniland, *Barnard* 147; Parys, *Barnard* and *Mogg* 756. Pilgrimsrest; Bushbuckridge, *Forest Officer* 28; Branddraai, *Young* A641. Nelspruit: *Breyer* 18001; Pretorius Kop, *Codd* 6173; v. d. *Schijff*, 961; Shabin, v. d. *Schijff* 670; Clobe, v. d. *Schijff* 1171; Near Nelspruit, *Liebenberg* 2632; Plaston, *Holt* 92; White River, *Rogers* in Tvl. Mus. 20528; *Rogers* 2348 (GRA).

SWAZILAND.—*Stewart* 8851; Lebombos, 25 m. S. of Stegi, *Hornby* 2819.

NATAL.—Without precise locality, *Kate Saunders* in Bol. Herb. 25402 (BOL); *Medley Wood* 356 (BOL). Nongoma: Mkusi River Valley, 5 m. N.E. Mkuzi, *Codd* 2058. Hlabisa: St. Lucia, *Lansdell* in N.H. 37644 (NH); Lower Umfolosi: 11 m. S.W. of Empageni, *Codd* 1879. Nqutu: Amangi Valley, native for *F. Bayer* in NH. 21766 (NH). Babanango: Umhlatuzi Valley, Melmoth Road, *Lawn* 939; 1280, 1890 (NH). Mtunzini: *Lawn* 1777 (NH); Ginginhlova, *Galpin* 133129; *Lawn* 1199; 1200 (NH); Myrlyn, Inyoni, *Johnson* 478. Umvoti: Rietvlei, *Craigie Burn*, *Fry* in herb *Galpin* 2751. Weenen: *Pentz* 539; *West* 1157; Sandspruit, *Acocks* 10560. Estcourt: near Muden, *Repton* 1192; Research Station, *West* 418; Mooi River Valley, *Sutherland* s.n. Pietermaritzburg: *Killick and Marais* 1999; Table Mountain, *Bond* 1250 (NBG); Durban Road, *Barker* 442 (NBG); Albert Falls, *Comins* 498; Tugela River, *Gerrard* 264 (NH). Camperdown: Cato Ridge, *McClellan and Ogilvie* in NH. 27921 (NH). Durban: *Medley Wood* 94 (SAM); 12411; s.n.; *Marloth* 4176; woods near Durban Bay, *Krauss* 458, type number (K); Berea, *Medley Wood* 150 (GRA); Clairmont, *Medley Wood* 11195 (NH); "Claremont", *Schlechter* 2951; Umhlanga, *Medley Wood* 10520 (NH); Springfield, *Indian* in NH. 17818 (NH); Bellair, *Lansdell* in NH. 34288 (NH). Umzinto: Umkomaas, *Tyson* 2666 (SAM); Drift Halt, *Lansdell* in NH. 34710 (NH).

CAPE.—Pondoland, without more precise locality, *Bachmann* 1030 (K). Bizana: *Bruce* 441; Mount Ayliff, *Story* 567. Port St. Johns: *Edwards* in Moss Herb. 8427 (J); Umtata: Umtata River near falls, *Schonland* 3775 (GRA); Kentani: near Kentani, *Pegler* 1253 (NBG). Komgha: near Komgha, *Flanagan* 59; 479; Kei Mouth, *Compton* 17685 (NBG). Queenstown: Gwatyn, *Galpin* 8266. East London: *John Wood* 3372 (poor); King William's Town: Pirie Forest, Muden Dam, *Acocks* 9290; Buffalo River Valley, *Galpin* 5912; Keiskama Hoek, *Cooper* 378 (BOL). Stockenström: Katberg, *Sole* 401; Fort Armstrong, *Martin* 158 (NBG). Elands River, *Scully* 84 (SAM). Victoria East: near Kweza Siding, *Acocks* 1115; near Alice, *Gillett* 4588; *Hutch and Dyer* 1688; *Dyer* 1796 (GRA); *Barker* 1414 (NBG). Peddie: Kafir Drift, *Compton* 17819 (NBG). Albany: between Blaauwkrantz and Kowie Poort, *Burchell* 3657, cited under *J. glaucum* in Fl. Cap. (K). Koonap Heights, *Dyer* 724; Alicedale, *Cruden* 143 (GRA); Plutos Vale *Barker* 2810 (NBG); Blaauwkrantz Bridge, *Galpin* 266 (GRA); Blaauwkrantz, *Hutchinson* 1569; Fish River Heights,

Hutton s.n. (K) and in Bolus Herb. 2540 (BOL); Fish River Valley, *Lotsy and Goddyn* 6 (L); Fort Brown, *Lotsy and Goddyn* 727 (L). Bathurst: Trapps Valley, *Daly* 626 (GRA). Somerset East: Zuurberg, *Compton* 20256 (NBG). Uitenhage: near Uitenhage, *Prior* s.n.; Thode A678 (NH); *West* 19 (GRA); Enon, *Thode* A1108; A2697; A678; Sand Fontein, *Burke* s.n. (K).

Also occurs in Portuguese East Africa and possibly in Southern Rhodesia.

In South Africa this species has quite a wide distribution and it is often found cultivated in gardens. It occurs frequently in the Waterberg district of the Transvaal, and from there eastwards to Swaziland, Natal and eastern Cape as far as the Uitenhage district. It is characterised by the usually single flower on a rather short pedicel (under 1 cm. long) at the end of short slender lateral twigs which are characteristically shortly and densely puberulous. The leaves on these twigs are usually young or stunted, smaller than those on the sterile branches and they frequently dry black and brittle giving the herbarium specimens a characteristic appearance. The sweetly scented flowers have very white radiating corolla lobes which are dorsally, wine-coloured or maroon, the buds and corolla tube being the same maroon colour.

In the Flora Capensis this species is partly confused with *J. glaucum* Aiton (see notes under that species), and the type number of *J. multipartitum*, Krauss 458, is cited under the latter species; on the other hand Burchell 3657 (K) is wrongly cited under *J. glaucum*. When correctly delimited, these species are clearly distinct. Not so clear is the difference between some of the northern specimens of *J. multipartitum* and some of *J. stenolobum* Rolfe. The main difference between these species is the obvious pubescence of *J. stenolobum* and the less conspicuous but characteristic short dense pubescence of *J. multipartitum*. In some of the Transvaal specimens where the distribution of the two species overlap there may, when material is not adequate, be some difficulty in distinguishing these species (see notes under *J. stenolobum*).

Specimens from Rhodesia and Portuguese East Africa which, except for the inflorescences being more often 3-flowered, fit into *J. multipartitum* as treated here, fall into the broad concept of *J. meyeri-johannes* Engl. as given in the Flora of Tropical East Africa (1952). In my opinion they should be classified as *J. multipartitum* Hochst., which seems to be distinct from the tropical species, judging from some of the specimens seen. If not distinct, *J. multipartitum* is the older name and would have to stand.

9. *J. stenolobum* Rolfe in Oates, Matabele Land, ed. 2: 403 (1889) Baker in Fl. Trop. Afr. 4, 1: 4 (1902); Harv. ex Wright in Fl. Cap. 4, 1: 481 (1907); Gilg & Schellenb. Bot. Jb. 51: 91 (1913); Turrill in F.T.E.A.: 24 (1952).

A bushy or straggling shrub, sometimes scrambling or climbing. Branches terete, pubescent, glabrescent; ultimate twigs 1-5 cm. long, rarely longer, densely or persistently pubescent to tomentulose with spreading or reflexed hairs. Leaves very variable in size and shape, from ovate-lanceolate or elliptic to ovate or ovate-oblong, usually 1-4 cm. long and 0.4-1.8 cm. broad, pubescent on both surfaces, without acarodormatia; petioles pubescent, 3-8 mm. long articulated near the base (rarely higher up). Inflorescence terminal on the short ultimate twigs, usually 1-flowered (occasionally 2-3-flowered); pedicels pubescent, usually short, 1-7 mm. long, occasionally up to 1 cm. long. Calyx pubescent, pubescence variable, hairs short or long and curly; tube 2-3 mm. long; lobes 6-13, subulate with U-shaped sinuses, 2.5-6 mm. long. Corolla white (buds red, *vide* Comins), fragrant; tube 2-2.5 cm. long; lobes 7-12, 1.3-1.7 cm. long, 3-5 mm. broad. Stamens inserted in upper half of the tube, included, anthers up to 5 mm. long, apiculate. Ovary sub-quadrangle, compressed, about 2 × 1.5 mm.; style 2-lobed at apex. Fruit a twin berry (one sometimes aborting), narrowly oblong, black, those seen about 1 cm. long and 6 mm. broad.

Type: *Oates*, Matabeleland, without more precise locality.

BECHUANALAND PROTECTORATE.—Kazungula, *Miller* B155; B383. Chobe, *Miller* B1121. Ngamiland, *Curson* 209; 210; 219.

TRANSSVAAL.—Soutpansberg: N.W. of Soutpan, *Obermeyer, Schweickerdt and Verdoorn* 92; Wyllies Poort, *Pole Evans* 1783; Punda Maria, *Lang* in Tvl. Mus. 32108; 32139; Baiandbai, *Lang* in Tvl. Mus. 32264; Dzundweni Hill, *Codd and Dyer* 4601. Pietersburg: Leipsig, Blaauwberg, *Bremekamp and Schweickerdt* 60; Chunies Poort, *Pole Evans* H. 19446. P.P. Rust; *Crawley* s.n. (or in Tvl. Mus. 7159); Swerwerskraal, *Rowland* 119; 126. Waterberg: Nylstroom, *van Dam* in Tvl. Mus. 20750. Middelburg: Middelburg, *Rogers* 24864. Lydenburg: Ohrigstad-Branddraai Rd., *Young* A 608; A 609; Waterfall, *Codd and Verdoorn* 7611; Nelspruit: Sigaas, K.N.P., *van der Schijff* 1302. Barberton: *Rogers* 24879; *Thorncroft* 4964; Berea Ridge, *Galpin* 621.

NATAL.—Entonjaneni: N. of Nkweleni, *Codd* 1840. New Hanover: Albert Falls, *Comins* 497. Mzinto: Umpanpanyoni, *Rudatis* 2010.

Also occurs in Portuguese East Africa, the Rhodesias, Nyasaland and Tanganyika.

In South Africa *J. stenolobum* is most like *J. multipartitum* from which it is mainly distinguished by the conspicuous pubescence on the twigs, leaves and calyx. The pubescence is mostly rather dense, tomentulous, with spreading or recurved, often crisped, hairs which vary somewhat in density and length. *J. multipartitum* on the other hand appears to be glabrous but is persistently, minutely and densely, puberulous, at least on the twigs. Between these species it is not a matter of one being glabrous and the other not, but a matter of a different type of pubescence and that, in my opinion, justifies upholding the two species, which in many other respects are so very similar. Both bear solitary flowers (or occasionally more) at the apex of short lateral twigs, on comparatively short and stout pedicels. The calyx lobes are usually definitely longer than the tube, the petioles are conspicuously articulate, and the leaves have no acarodomatia in the axils of the veins below. The leaves of *J. multipartitum* are extremely soft, the young ones shiny in the sun whereas in *J. stenolobum* the leaves are usually so pubescent that they give a different impression. From collector's notes it is impossible to discover whether the flowers of *J. stenolobum* have the dorsal face of the lobes and the tube a maroon colour as in *J. multipartitum*.

The areas of distribution of the two species overlap in the Transvaal and Natal and from these regions, at certain stages of growth and when the specimen is inadequate, it may be difficult to decide to which of the two a specimen belongs, but on the whole they are very easily distinguished. It has not been found, to date, that *J. multipartitum* occurs in the Kalahari sand veld such as in Bechuanaland, Ngamiland, Matabeleland, the Soutpansberg region and so forth, where *J. stenolobum* is frequent, and in the same way the latter species has never been found in the eastern Cape where *J. multipartitum* abounds.

Outside South Africa, in the more tropical regions, *J. stenolobum* has a tendency to scramble or climb more freely and to bear more than one flower in an inflorescence.

The legend on a specimen from Cloma, Northern Rhodesia, reads: "Berries brown, produce state of coma when swallowed and inability to swallow".

10. *J. streptopus* *E. Mey.* aggregate species.

(a) var. *streptopus*.

(b) var. *transvaalense* (*Sp. Moore*) *Verdoorn* stat. nov.

Climbing or scrambling shrub; branchlets often slender, pubescent, hairs of different lengths, appressed or patent, straight or crisped. *Leaves* simple, rather thin, oblong-elliptic, ovate-oblong or ovate acuminate, 1.5–7 cm. long and .8–3 cm. broad, rounded or acute at the apex, mucronate, pubescent on both surfaces, especially along the midrib, forming a fringe on each side of it, usually with acarodomatia on the lower

surface in the axils of the lateral veins; petioles pubescent, short, 1–4 mm. long, rarely 5 mm. long, obscurely articulate near the apex and somewhat twisted. *Inflorescence* terminal on ultimate branchlets, 1–5-flowered, often 4-flowered. *Pedicels* thinly pubescent with crisped or patent hairs, glabrescent, usually 5–20 mm. long. *Calyx* pilose, glabrescent; tube 1–2.5 mm. long; lobes 4–7, subulate from a triangular base, subulate portion varying in length (with age of flower?), sometimes very short 1.5–7 mm. long. *Corolla* white, fragrant; tube slender 2–3 cm. long; lobes 6–8, about 1.6 cm. long and 3 mm. broad. *Fruit* a twin berry often one only developing, globose, brownish to black, about 7 mm. diam.

PLATES 11 and 12.

The species is characterised by a combination of the following features: Crisped pubescence on the twigs; rather short petioles articulated near the apex; acarodomatia on lower surface of leaves usually in axils of upper as well as basal veins; comparatively long slender pedicels; calyx lobes subulate from a triangular base, the subulate portion varying in length (very short or up to 7 mm. long), sometimes on the same specimen. The character which evidently gives the species its name, the slightly twisted petiole, is not restricted to *J. streptopus* but may be found to some extent in almost all the species.

The calyx lobes in this species call for some special mention. In the South African species already dealt with these lobes are either short and thick or clearly subulate. In *J. streptopus*, and some tropical species like it, there seems to be a combination of the two types of calyx lobes, the basal portion being fairly short and thick and produced at the apex into an erect subulate portion. This subulate portion varies considerably in length sometimes on the same species. It has been suggested that on young flowers the subulate portion is absent or short and elongates with the age of the flower. While this is borne out in some specimens it is not always the case and the variation seems to occur haphazardly.

The South African specimens of this species fall into two groups which are here given varietal rank and are described below. It is probable that some of the closely related species in tropical Africa are also no more than varieties of the species. Mention is made of two of these tropical species, one under each of the varieties below.

This is an example, as pointed out in the introduction, of the authority for an E. Meyer species being given as "E. Mey. ex DC." whereas E. Meyer described it in his "Commentariorum" in 1837.

(a) var. **streptopus**; *J. streptopus* E. Mey. Comm. 1, fasc. 2: 173 (1837); DC. Prod. 8: 307 (1844); Wood & Evans in Natal Plants 1, tab. 50 (1899); Harv. ex Wright in Fl. Cap. 4, 1: 481 (1907).

Type: *Drege*, "margin of woods near Port Natal".

NATAL.—Durban: *Medley Wood* 900 (NH); 10113 (NH); *Schlechter* 2967 (GRA); Berea, *Medley Wood* 3786 (NH); Stella Wood, *Lavoipierre* 95; 96; N.E. of Waterfall, *Dohse* 81. Inanda: *Medley Wood* 1191, cited in Fl. Cap.

Probably also occurs in Southern Rhodesia and Portuguese East Africa.

The typical variety (see plate 11) is characterised by the pubescent, oblong-elliptic to ovate-oblong leaves, mostly 4–7 cm. long and 1.6–3 cm. broad, and the 3–5-flowered, often 4-flowered, inflorescences, terminal on the ultimate branchlets. From the material examined it would seem that it is very localised for all the S. African specimens seen come from the Durban area. Outside South Africa a couple of specimens from Umtali and one from Portuguese East Africa may prove to be this variety. On the other hand they may belong to the closely related *J. pauciflorum* Bth. which differs in having the inflorescences in the axils of the lateral leaves as well as terminal. The above specimens may be merely portions of the plant where the lateral inflorescences are not present. On the other hand it is possible that the lateral inflorescence is not a specific character

and that *J. pauciflorum* is no more than another variety of *J. streptopus*, with the tendency for the inflorescence to be axillary as well as terminal. Further study of tropical specimens should settle this point and may show that a few more closely related species in those regions are no more than varieties of *J. streptopus*, which is the oldest described species in this group.

(b). var. **transvaalense** (*Sp. Moore*) *Verdoorn* stat. nov. *J. transvaalense* *Sp. Moore* in *J. Bot.*, Lond. 56: 10 (1918).

Type: *Rogers* 18108, Modjadjes, Letaba, Transvaal.

TRANSVAAL.—Soutpansberg: *Louis Trichardt*, *Breyer* 22718; 22719; Malta Gorge, *Junod* 4437; Elim, *Obermeyer* 29253; Makonda, *Westphal* in *Tvl. Mus.* 29114; Pepeti Falls, *Smuts and Gillett* 3233; 3180. Pietersburg: *Blauwberg*, *Codd & Dyer* 9128; 9168; Woodbush, *Bolus* 11117 (BOL); *Rehmann* 5952 (BOL); *Eliovson* in *Wits Herb.* 26953; The Downs, *Junod* 4158. Belfast: *Dullstroom*, *Galpin* 13297. Ermelo: *Mavieriestad*, *Pott* 4909. Letaba: *Selati Mission*, *Gerstner* 5510. Pilgrims Rest: *Sabie Hoek*, *Burt-Davy* 1519. Lothian, *Forest Officer* 22; *Bushbuck Ridge*, *Smuts and Gillett* 2351. *Piet Retief*: *Sidey* 2054; *Pole Evans* 16.

NATAL.—Eshowe: on margin forest, *Gerstner* 3886 (NH); Hlinza Forest edge, *Lawn* 1335 (NH); Emkazeni Forests, *Fernando* 10399 (NH). Camperdown: *Fairfield*, *Rudatis* 2042 (NH). Pietermaritzburg: *Townhill*, *F.G.C.* 339; *Howick*, *Shafton*, *Hutton* 1180 (GRA).

CAPE.—Bizana: *Acocks* 12230; *Emagushen*, *Tyson* 2815; 3150 (SAM).

This varietal form has not been collected outside South Africa, but in the tropical regions there are very closely related species.

J. streptopus var. *transvaalense* (see plate 12) is more widely spread than the typical variety. It is distinguished by the smaller, ovate-acuminate leaves, 1.5–3.5 cm. long and .8–1.4 cm. broad, and the inflorescences frequently being 1-flowered. Although these characters give the specimens a distinct appearance, they are not fixed and therefore cannot be considered to be specific. A few of the leaves often become large and take on the shape of the typical form while the inflorescence occasionally is more than 1-flowered. In the shape of the leaf and the 1-flowered inflorescence it resembles *J. swynnertonii* *Sp. Moore* from Portuguese East Africa, the Rhodesias and Tanganyika, but this latter species has slightly larger leaves with more prominent veins. It is doubtful whether *J. swynnertonii* (described in 1911) can be anything more than another variety of *J. streptopus*.

3. OLEA.

Linn., *Gen. Pl.*, ed. 5, 8 (1754); *Benth. & Hook.* in *Gen. Pl.* 2, 2: 679 (1876); *Harvey ex Wright* in *Fl. Cap.* 4, 1: 485 (1907); *Phillips Gen. S.A. Fl. Pl.* ed. 2: 572 (1951) pro parte.

Shrubs or trees, sometimes forest trees up to 100 feet tall. *Leaves* opposite, entire, lepidote scaly, sometimes minutely and sparsely so. *Inflorescence* trichotomous panicles, many flowered, axillary or terminal. *Calyx* persistent, cucullate, 4-toothed or shortly 4-lobed. *Corolla* united into a short tube, 4-lobed, lobes rather broad forming a sub-globose bud, ultimately reflexed with tips ascending, deciduous. *Stamens* 2, inserted on the corolla-tube, filaments short, anthers dorsifixed, relatively large with extrorse dehiscence. *Ovary* subglobose, narrowed into a short style, stigma terminal, bi-lobed; ovules 2, pendulous. *Fruit*, a drupe with a thin fleshy layer, endocarp rather hard with large seed cavity; seed usually solitary, endosperm present, cotyledons thin.

Type species: *Olea europaea* Linn., the cultivated Olive.

The description by Phillips in Genera of S.A. Flowering Plants was drawn up from both *Olea* and *Linociera* species in South Africa and therefore only partly applies to *Olea*. The reasons for keeping *Linociera* separate are given in the notes on that genus.

The leaves of *Olea* species never have acarodomatia in the axils of the veins below; the inflorescences are usually many to very densely many-flowered and the flowers are small, remaining in the bud stage rather long, with the buds subglobose, and, in all *Oleas* examined, the ovules were attached at the apex and endosperm was present in the seed.

Key to Species.

Inflorescence axillary as well as terminal:

Leaves usually densely covered with small scales below, linear-lanceolate to narrowly oblong-elliptic..... 1. *O. africana*.

Leaves fairly sparsely and very minutely scaly below appearing minutely pitted, lanceolate-elliptic to elliptic, usually broadest about the middle and from there tapering to base and apex; ultimate branchlets slender usually whitish, in parts obviously quadrate..... 2. *O. woodiana*.

Inflorescence terminal and axillary only in the two upper pairs of leaves:

Leaves linear-oblong, up to about 1 cm. broad, broadest in upper two-thirds, long cuneate to the base..... 3. *O. exasperata*.

Leaves of various shapes and sizes but never linear-oblong, usually more than 1 cm. broad..... 4. *O. capensis* (aggregate sp.).

Fruit subglobose to oblong-elliptic, up to 1 cm. long; shrubs or trees up to 50 feet tall; leaves crowded on herbarium specimens; inflorescence densely flowered:

Leaves very variable often rounded at apex; midrib prominent beneath from base to apex; branchlet dark grey to greyish brown; Cape coastal regions..... 4a. subsp. *capensis*.

Leaves usually broadly elliptic, shortly acuminate to base and apex; midrib prominent only in lower half beneath, disappearing in upper half; branchlets grey to whitish, leaves deciduous with prominent leaf-scars. Transvaal and Natal..... 4b. subsp. *enervis*.

Fruit large, oblong-elliptic about 1.5 cm. long; forest trees sometimes 90 feet tall; leaves elliptic, tapering to base and apex; petiole usually long and spreading and leaves not very crowded on herbarium specimens; inflorescence many flowered but not densely so..... 4c. subsp. *macrocarpa*.

1. *O. africana* Mill. Gard. Dict. Ed. 8, n. 4 (1768); Adamson in Flora of the Cape Peninsula p. 669 (1950). *O. chrysophylla* Lam. Tabl. Encycl. 1: 29 (1791) et Dict. 4: 544 (1794); Baker in Fl. Trop. Afr. 4, 1: 18 (1902); Chevalier in Rev. de Bot. Appl. no. 303-304 (1948); Turrill in F.T.E.A. "Oleaceae" p. 9 (1952); *O. europaea* Thb. Prod. Pl. Cap. 2 (1794) non Linn.; *O. similis* Burch. Trav. 1: 177 (1822); *O. europaea* var. *nubica* Bkr. in Fl. Trop. Afr. 4, 1: 18 (1902); *O. verrucosa* Link. Enumer. Pl. Hort. Berol. 1: 33 (1821); DC. Prodr. 8: 285 (1844); var. *brachybotrys* DC. l.c.; Harv. ex Wright in Fl. Cap. 4: 486 (1907), excl. syn. *O. woodiana* Knobl.

[According to Chevalier l.c., *O. somaliensis* Bkr., *O. ferruginea* Royle, *O. cuspidata* Wall. ex G. Don., *O. schimperi* Gandoger and *O. monticola* Gandoger (all unknown in South Africa) are also synonyms of *O. chrysophylla* and therefore of *O. africana*.]

Trees often 10 to 40 feet tall, sometimes stunted bushy growths; branchlets verrucose. *Leaves* with a tendency for the sides to curl downwards as well as marginal rim being reflexed, dark green above, paler beneath where it is densely covered, rarely fairly sparsely so, with small silvery, golden or pale green scales, linear-lanceolate or narrowly oblong elliptic, narrowed at base and apex (apex sometimes bluntly rounded), 1.9–8.5 cm. long and 0.7–1.5 cm. broad, rarely broader (see Clanwilliam and Barberton specimens), mucronate; midrib impressed above, prominent beneath; lateral veins obscure or faintly obvious, loops forming a more or less continuous line within the margin, petiole usually 3–10 mm. long. *Panicles* axillary, sometimes a short terminal panicle too, varying in size, usually shorter than the subtending leaf the branches verrucose and scaly; bracts deciduous. *Flowers* small, white. *Calyx* cupular, up to 1 mm. long, very shortly or obscurely 4-toothed. *Corolla* with a short tube, about 1 mm. long; lobes more or less connivent, eventually spreading to reflexed, about 2 mm. long, 1.5 mm. broad, margins narrowly infolded. *Stamens* inserted on the corolla, filaments under 1 mm. long, more or less terete, anther attached near the base, 1.5 mm. long, 1 mm. broad. *Ovary* sub-globose, narrowing into a short style; stigma 2-lobed, forming a conico-globosa head; ovules pendulous. *Drupe* green with whitish spots turning black or prune-coloured, sub-globose to oblong in outline, up to 1 cm. by 9 mm. on dry specimens.

FIG. 3 AND PLATE 13.

Type: no specimen preserved, but plant described came originally from the "Cape of Good Hope". Types of synonyms: *O. chrysophylla* Lam., *Sonnerat*, Reunion (*fide* Turrill); *O. europaea* Thb., *Thunberg*, Drakenstein near Cape Town; *O. similis* Burch., *Burchell*, Olyvenhout Bosch, near Cape Town; *O. verrucosa* Link., plant described came originally from the "Cape of Good Hope"; *O. europaea* var. *nubica* Bkr., *Schweinfurth* 249, near Suakin, Nubia.

TRANSVAAL.—Soutpansberg: Wyllies Poort, *Hutchinson* 2064 (BOL); *Gerstner* 5865. Pietersburg: Blaauwberg, *Smuts* and *Pole Evans* 899; *Codd* and *Dyer* 9135; *Houseman* in Col. Herb. PRE. 5328; Leipzig, *Tsheuschaner* in Tvl. Mus. Herb. 29509 (stunted); Letaba: Woodbush, *Hoffman* 18; The Downs, *Rogers* 20165. Potgietersrust: Makapansberg, *Rehman* 5395 (SAM). Waterberg: Naboomspruit, *Galpin* M. 208 (SAM). Marico: near Zeerust, *Marloth* 9535; *Thode* A1443; Wonderfontein, *Burt Davy* 7222; banks of Klein Marico, *Burt Davy* 7243. Lichtenburg: near Lichtenburg, *Kinges* 1513 and 1738. Ventersdorp: Goedgedacht, *Sutton* 620. Rustenburg: Swartruggens *Sutton* 851; 850; near Rustenburg, *Hutchinson* 2932; Boshoeck, *Rose-Innes* 57; Buffelspoort, *Turner* 5. Pretoria: Lotsy and Goddyn s.n. (L.); Aapies Poort, *Rehmann* 4052 (SAM); Magaliesberg, *Zeyher* 1133 (SAM); Fountains Valley, *Repton* 309a and 125; *Hutchinson* 2317; *Verdoorn* 421 and 605; Curtis Hill, *Pole Evans* 257. Brits: *Gun* 2; 3 (stunted). Krugersdorp: Hekpoort, *Cohen* 495; 1083; and 1240. Witbank: near Loskop Dam, *Mogg* 17285. Lydenburg: Sekukuniland, *Barnard* 68; 269; *Barnard* and *Mogg* 905. Letaba: Modjadjies Reserve, *Krige* 134; Kruger National Park, *van der Schyff* 56, 183; banks of Letaba, *Burt Davy* 2548. Nelspruit: Malelane, *Codd* 5223. Barberton: *Rogers Thorncroft* in *Roger's* Herb. 30059; *Pott* 5695 (leaves broad, marginal veins obvious)

SWAZILAND.—Ubombo Mountains, *Miller* S/54; *Hornby* 2812.

NATAL.—Eshowe: Empangeni Rd., *Lawn* 1667 (NH). Weenen: *West* 1211; Umhlumba, *West* 1453. Hlabisa: False Bay, *Gerstner* 5242; White Umfolosi, *Gerstner* 3528 (NH). Misinga: *Killick & Marais* 2116. Umvati: *Killick & Marais* 2118 (stunted). Durban: *Medley Wood* 7750; Berea Bush, *Medley Wood* 3156 (NH) (this specimen is *O. africana* and not *O. woodiana*, mixed gathering under nos. 548 & 3156 explains citation under *O. woodiana*).

BASUTOLAND.—Mafeteng: Likhuele Mtn., *Dieterlen* 1242. Leribe: *Dieterlen* 313, and 715 (stunted). Mamathes: *Guillarmod* 77 (NH).

ORANGE FREE STATE.—Senekal: *Goossens* 977. Ladybrand: *Patterson* 5090 (GRA). Bloemfontein: *Pot* 626 (BOL); Naval Hill, *Compton* 15662 (NBG). Fauresmith: Vaalberg, *Smith* 5469; reserve hill, *Smith* 5588; *Henrici* 1883; *Verdoorn* 2375; south townlands, *Verdoorn* 940; Bergplaas, *Verdoorn* 1660, 1655; and 2759 (stunted).

BECHUANALAND.—Kanye: *Miller* B/248; Pharing, *Hillary* and *Robertson* 523; Ootsi, *Miller* B/231.

SOUTH WEST AFRICA.—Aus: *Pillans* 5964, Griqualand West variant (BOL); *Marloth* 4654. Grootfontein: *Liebenberg* 4880; Bristoes farm, *Maguire* 1740 (NBG); farm Kumkauas, *Kinges* 2890; Venterspost, *Schoenfelder* S464. Otavi: *Dinter* 5294. Rehoboth: *Bullspoort*, *Rodin* 2965.

CAPE.—Komgha: *Flanagan* 17. Queenstown: Bowker's Park, *Galpin* 2566; Long Hill Peak, *Galpin* 7730. King Williams Town: *Sim* 2155. Keiskama Hoek: Ngumeya Forest, *Stayner* 70 (GRA). Somerset East: *MacOwan* s.n. (GRA); Boschberg, *MacOwan* 1364 (SAM). Graaff-Reinett: *Bolus* 610 (BOL). Bathurst: *Smuis* 1329; *Britten* 2385 (GRA). Alexandria: *Sim* in F.D. Herb. 3166. Uitenhage: *Drege* s.n.; *Ecklon & Zeyher* s.n.; *Prior* s.n.; *Krauss* 1795 (BOL); *Paterson* 2329 (BOL); Springfields, *Paterson* 1913 and 2194 (GRA). Humansdorp: Bitouw River, *Fourcade* 619 (GRA); Hankey Reserve, *Sim* 3958; and 3995 (Forestry). Knysna: Belvedere, *Duthie* 33 (GRA). Oudtshoorn: Gango, *Britten* 1743 and 1649 (stunted) (GRA). Riversdale: *Corenti* River, *Muir* 342; 5147 (GRA); near Riversdale, *Schlechter* 2005 (GRA). Gordonias: Upington, *Kotze* 839, Griqualand West variant. Taungs: *Rodin* 3629 (BOL); Buxton, *Bruechner* 1214. Kimberley: near Taungs, *Rodin* 3629; Nooitgedacht, *Mogg* 15111. Barkly West: Drooogegrond, *Whitlock* s.n.; between Delpoort Hope and Kneukel, *Acocks* in Hafstroom Herb. H1215; Boetsap, *Brueckner* 132. Hay: near Campbell, *Pole Evans* 6; 8; and 30; Griquatown, *Marloth* s.n. (stunted); Blaauw Poort, *Wilman* 1316; Papkuil, *Marloth* 9946. Victoria West: Brakfontein, *Thode* A2167. Namaqualand: Rattel Poort, *Pearson* 2966 (BOL). Calvinia: Lokenburg, *Story* 4284. Clanwilliam: Greys Pass, *Barker* 6190; *Maguire* 2029; *Pillans* 9839, large leafed specimens, leaves about 1.9 cm. broad (BOL); Uitkyk Pass, *Bond* 1412 (NBG); Pakhuis Pass, *Compton* 4741 (NBG); *Esterhuizen* 14983, short broad leaves, (BOL). Piquetberg: *Pillans* 8629; 7178 (BOL); Pickeniers Pass, *Pillans* 5153 (BOL); Modderfontein, *Howes* 224. Ceres: Mitchells Pass, *Esterhuysen* 20719; 14736 (BOL). Ladysmith: Sewe Weeks Poort, *Bond* 258 (NBG). Worcester: Hexriver Mountains, *Rehmann* 2704. Paarl: Paarl Mountain, *Drege* s.n.; Klein Drakenstein, *Galpin* 11041. Stellenbosch: Jonkershoek, *Parker* 4730 (SAM); Helderberg: *Parker* 4093 (NBG). Peninsula: Table Mountain, *Drege* s.n.; *Gerstner* 6142; *Lotsy* and *Goddyn* (L.); Devil's Mountain, *Drege* s.n.; Kirstenbosch, *Esterhuizen* 72 and 662 (NBG); Llandudno, *Compton* 21029 (NBG); west coast, *Humbert* 9505; Blinkwater Waterfall, *Marloth* s.n.; Karbonkelberg, *Adamson* 1209.

Also occurs in North and East Tropical Africa and the Mascarenes and, according to Chevalier, in India and Arabia as well.

It is to be expected that a species with such a wide distribution will vary to some extent and that regional forms will occur. An example of such a form may be seen in specimens from the Griqualand West region. Here the leaves are on the whole smaller with very silvery scales on the lower surface and with the margins incurled, but this form grades into the more usual and it is not strictly confined to the region mentioned. A large leafed form has been collected in the Clanwilliam area and at Barberton. Another variation which, however, is not a regional one, is the dwarfed or stunted form. Such specimens may be found in any region and they are usually growing in the neighbourhood of normal trees.

That this stunted form is very different from the normal growth is remarked on by Chevalier,* but it certainly cannot be regarded as a variety for it has been observed that from such a stunted bush a normal branch may develop.

This is borne out by the finding of Mohammed Drar, published in Bulletin 149, Technical and Scientific Services, Egypt, pages 85-88 (1936), where he shows that *O. europaea* var. *nubica* Bkr. is a "sucker specimen" (that is the stunted form, from his description and photograph) of "*O. chrysophyllum*". Among the specimens cited these stunted ones and the regional forms mentioned are indicated.

The habitat of *O. africana* ranges from forest and riverside bush to open grassveld, flats, stony ground, mountain kloofs or rocky ridges. It may be found in flower from October to March.

The species is distinguished by the densely scaly under surface of the leaf, which is linear-lanceolate or narrowly oblong-lanceolate, rarely some leaves obovate-oblong, margins usually recurving as the leaf dries, lateral veins anastomosing near the margin, the loops forming a more or less continuous line along, but a short distance from, the margin; by the axillary inflorescence and the fruit which is oblong-globose and up to 1 cm. long. It is closely related to the cultivated olive, *Olea europaea* Linn., and may be the origin of it.

Chevalier in the above-mentioned paper keeps the wild species separate specifically from the cultivated and this seems a wise and orderly treatment. The only tangible differences between the two species are the larger flowers and the larger and more fleshy fruits of *O. europaea* which may have come about through selection and cultivation but, if so, these characters have now been established and reproduce true to type.

For the wild species, Chevalier gives *O. chrysophylla* Lam. (1791), as the oldest name with *O. verrucosa* Link., etc., as synonyms, but in doing so he seems to have overlooked the fact that *O. africana* Mill. was described in 1768 and therefore has priority. It is possible that Chevalier ignored Miller's name as that of an insufficiently known species. At first it did seem doubtful to some of us whether, in the absence of a type specimen, Miller's species could be identified with certainty. The question was asked, is there sufficient evidence to establish that *O. africana* Mill. is the same as the species which had come to be known as "*O. verrucosa* Link." at the Cape and is described under that name in Flora Capensis. After months of investigation which included writing to Prof. Adamson of the University of Cape Town and the Director of the Royal Botanic Gardens, Kew, it was finally settled that this is so. The consensus of opinion is that Miller's notes leave one in no doubt, for he writes (1) that the species "grows naturally at the Cape" and (2) that it grows to the height of and bears some resemblance to *O. gallica* Mill., that is *O. europaea* L., the cultivated olive. This cannot be said of any of the other species at the Cape, and also Miller's description of the leaf does not fit that of any of the others. Furthermore Miller cites, as a synonym of his *O. africanum*, Boerhaaves phrase-name for a species from the "Cape" and it too describes unmistakably the species under discussion.

Specimens of *O. chrysophylla* Lam. from Mauritius and Reunion, the type locality of the species, seen among sheets sent on loan from the Ryksherbarium, Leiden, are obviously conspecific with certain specimens from South Africa and also some from tropical east Africa and Abyssinia. It does not seem feasible to separate the specimens from these three remote countries even into distinct varieties for in some cases they compare better with each other than for instance, the Griqualand West form with the majority of specimens from the rest of South Africa. No attempt is therefore being made to follow Chevalier's division of the species into 8 varieties, evidently based principally on the country of origin, or to give any sub-specific rank to the ecotype in S. Africa.

* "L'Origine de l'Olivier cultive et ses variations" in Rev. Bot. Appl. n. 303-304 (1948).

The timber of *O. africana* is considered to be valuable and durable. The leaves are eaten by stock and the natives use an extract from the leaves boiled in water as coffee.

The common name "Wild Olive" is generally used for this species in South Africa. There is no modern record of the name "Slagenhout" mentioned by Boerhaave.

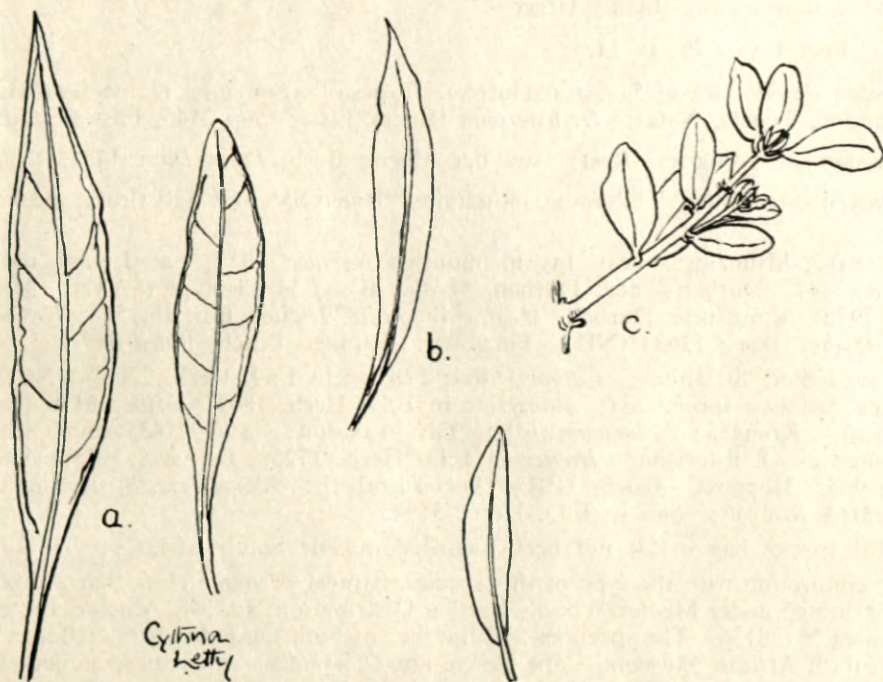


FIG. 3.—*Olea africana* Mill.; a, example of leaves from a specimen from the Peninsula; b, from Griqualand West; c, stunted form, from Fauresmith district.

2. *O. woodiana* Knobl. in Bot. Jb. 17: 532 (1893); Medley Wood in Natal Plants, 3, plate 237 (1902); Sim, Forest Fl. C.C. p. 266, pl. 108, (1907). *O. mackenii* Harv. ex Wright in Fl. Cap. 4, 1: 488 (1907). *O. listeriana* Sim ex Lister in Rep. Conserv. For. Cape for 1897, 98 (name only); Wright in Fl. Cap. 4, 1: 1129 (1909); Sim Forest Fl. C.C. p. 266 in obs.

Tree 12–50 feet, rarely 100 feet tall, with whitish bark, smooth or fluted; ultimate twigs pale grey or whitish, more or less lenticular, at least some of the upper internodes 4-angled. Leaves lanceolate-elliptic to elliptic, usually broadest about the middle and from there narrowing to an acute base and apex (apex sometimes rounded), 4–8 cm. long, .8–3.3 cm. broad, flat with just the marginal rim reflexed and often loosely undulate, minutely scaly, giving the appearance of being minutely pitted, especially on lower surface, midrib more or less impressed above, prominent below, lateral veins sometimes faintly obvious, then prominent above, anastomosing in large loops near the margins (loops not forming an almost straight line along the margin); petiole 4–10 mm. long. Panicles axillary and quite frequently terminal too, many flowered but not dense and compact; branches slender, sub-terete, 4-angled or variously flattened and fluted, internodes and peduncles relatively long, pedicels short; bracts up to 4 mm. long, sub-deciduous. Calyx small cupular and shortly 4-lobed, up to

1 mm. long. *Corolla* white; tube .75 mm. long; lobes about 2.25 mm. long and 1.5 mm. broad, forming a sub-globose bud, eventually reflexed. *Stamens* with filaments inserted on the tube, free for about 1 mm., anther 1.5 mm. long, 1.25 mm. broad, attached about at the middle. *Ovary* sub-globose; style very short; stigma 2-lobed conico-globose; ovules pendulous. *Drupe* drying blackish, semi-ovoid, narrowing to apex and oblique at base, usually about 1 cm. long and 5 mm. broad in dried specimens, occasionally slightly larger.

FIG. 4 AND PLATE 14.

Type: *Medley Wood* 548, near Durban. Types of synonyms: *O. mackenii* Harv., *Gerrard* 380, Tugela, Natal; *O. listeriana* Sim ex Lister, *Sim* 2143, East London.

TRANSVAAL.—Pilgrims Rest: van der Merwe Bush, *Burt Davy* 1428.

SWAZILAND.—Stegi: Ubombo mountains, *Miller* S55 and S20 (leafy specimens only).

NATAL.—Mtunzini: near Inyoni mouth, *Gerstner* 1957; at Inyoni mouth, *Gerstner* 2444. Durban: near Durban, *Medley Wood* 548, isotype (SAM); *Medley Wood* 7975; shore near Durban, *Medley Wood* 7879, cited Bot. Jb. 51: 76 (NH); Bluff, *Medley Wood* 12634 (NH). Pinetown: Isipingo Beach, *Ward* 649.

CAPE.—Port St. Johns: *Galpin* 11464; *Doran* in F.D. Herb. 2265, 2136, 2137 (galls on last two specimens); *Robertson* in F.D. Herb. 1862; *Miller* 6130 (galled specimen). Komgha: *Flanagan* 618. East London: *Sim* 2143, small leaves, distributed as *O. listeriana*; *Hunter* in F.D. Herb. 1725. Bathurst: Port Alfred, *Rogers* 905; Hopewell, *Acocks* 11047. Port Elizabeth: Alexandria, *Strauch* in F.D. Herb. 3163 & 3246; *Sim* in F.D. Herb. 3164.

This species has so far not been recorded outside South Africa.

In connection with the type of this species, it must be made clear that a mixture was distributed under *Medley Wood's* Garden Distribution No. 548, which is the same as his own No. 3156. The specimens with either or both these numbers at Berlin and in the South African Museum, Cape Town, are *O. woodiana* whereas specimens with the same numbers in the Kew Herbarium and the National Herbarium, Pretoria are *O. africana* (= *O. verrucosa*). This error probably accounts for the fact that *O. woodiana* Knobl. is cited as a synonym under *O. verrucosa* Link. in the Flora Capensis while *O. mackenii* Harv., which is synonymous with *O. woodiana* Knobl., is there described as a new species.

From *O. africana*, the only other species with axillary inflorescences, *O. woodiana* is distinguished principally by the shape of the leaves which are more or less elliptic, broadest about the middle and from there narrowing to the base and apex (that is the margins are not more or less parallel for a certain distance as in the linear- or narrowly oblong-lanceolate leaves of *O. africana*); the under surface being minutely and fairly sparsely scaly, appearing pitted, instead of obviously and densely scaly; the flatter leaves (not inclined to curl up longitudinally with the under surface often concave); the anastomosing loops of the veins not forming a more or less straight line inside the margin; having rather large terminal panicles as well as axillary; and the fruit being somewhat longer, usually oblique and narrowing towards the apex (semi-ovate in outline).

Among the species with only terminal inflorescences, *O. woodiana* resembles *O. capensis* subsp. *macrocarpa* to a certain extent, especially in the leaves. It differs in the ultimate twigs being whitish and at least in part 4-sided; the branches of the inflorescences being very slender and having longer internodes; peduncles with the flowers more or less clustered at the ends on relatively short pedicels; and fruits not as large, up to 1 cm. long.

O. woodiana has a comparatively restricted distribution being found only in the eastern regions of S. Africa. At Durban, according to records, it grows in the vicinity of *O. africana*.

The timber is described as "steel-like" by Gerstner.

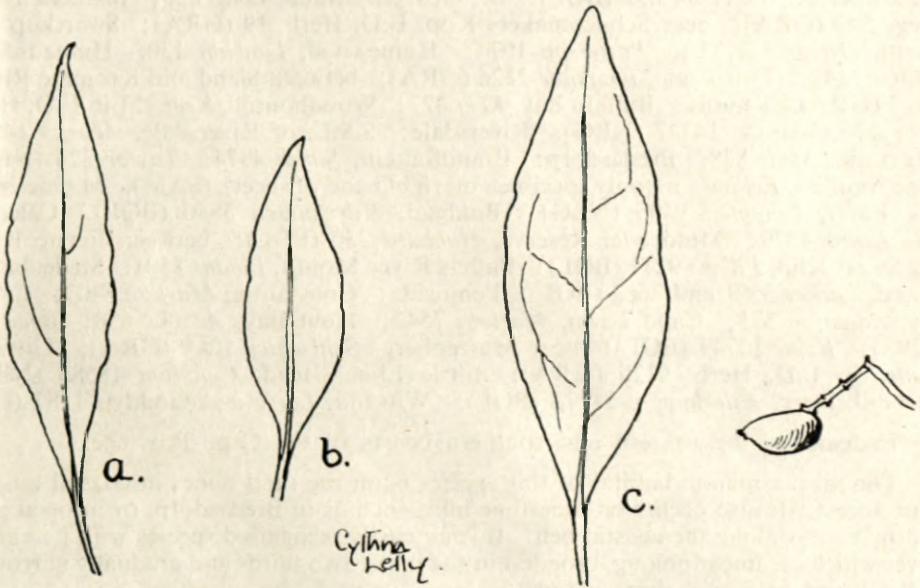


FIG. 4.—*Olea woodiana* Knobl.; *a*, example of leaf-shape from type locality; *b*, from East London; *c*, from Port St. John's, with fruit.

3. *O. exasperata* Jacq. Hort. Schoenbr. 3, 1, t 251 (1798); DC. Prodr. 8: 287 (1844); Knobl. in Bot. Jb. 17: 533 (1893); Harv. ex Wright in Fl. Cap. 4, 1: 486 (1907); *O. humilis* Eckl. South Africa quart. journ. 1: 370 (1830); DC. Prodr. 8: 287 (1844); Sim in Forest Fl. of C.C. p. 266, pl. 120 (1907).

Bushy or straggling shrubs or small umbrella shaped trees, from about 2 feet to 20 feet tall, rarely taller, branchlets rough with numerous raised lenticles. *Leaves* with a tendency for sides to curl downwards as in *O. african*, linear-oblong, 4–8.5 cm. long, 6–10 mm. broad, rarely 1.5 cm. broad; broadest in the upper two thirds, narrowing gradually to the base, minutely pitted on both surfaces, especially on lower, midrib raised on lower surface, sometimes also on upper, a few lateral veins sometimes obvious and raised above but disappearing about half way to the margin, anastomosing seldom seen, but if so loops curved; margin rim reflexed; petiole 4 mm. long rarely 5 mm. *Panicles* terminal, short, broad, many flowered; buds sub-globose; bracts very small, pointed, sub-persistent. *Calyx* short, cupular, glandular, shortly 4-toothed. *Corolla* with a short tube under 1 mm. long; lobes up to 2.75 mm. long, margins narrowly infolded. *Stamens* with filament almost 1 mm. long; anthers large brownish about 2 mm. long and 2 mm. broad, dorsifixed. *Ovary* narrowing into a short style; stigma 2-lobed forming a conico-globose head; ovules pendulous. *Fruit* "black purple" when ripe, up to 1 cm. long and 8 or 9 mm. broad, sub-globose to oblong-globose.

FIG. 5 AND PLATE 15.

Type: figure in Jacq. Hort. Schoenbr. 3, 1, t 251, plant originally from "Cape of Good Hope". Type of synonym: *O. humilis* Eckl., *Ecklon*, "in dunes at the Cape".

CAPE.—East London: *Sim* 2310. Bathurst: Kariega Mouth, *Story* 3254; Kowie, *Burchell* 3829; *Tyson* s.n.; *Britten* 5009 (GRA); *Salisbury* s.n. (GRA); Kasouga, *Britten* 2110 and 2339; Port Alfred, *Rogers* s.n. (GRA). Uitenhage: Addo, *E. & Z.* s.n.; *Drege* s.n.; Koega and Swartkop Rivers, *Zeyher* 3373 (SAM). Port Elizabeth: *Strauch* 4233; *Paterson* 852 (BOL); St. Georges Strand, *Long* 856; Baakens River, *Drege* 343 (GRA); near Schoenmakers Kop, F.D. Herb. 19 (GRA); Swartkop Riv. Mouth, *Drege* s.n. (L); *Patterson* 1974; Humewood, *Lanham* 130. Humansdorp: *Phillips* 3349; Tsitsikama, *Fourcade* 232a (GRA); between Sland and Kromme Rivier, *Sim* 3 (GRA). Knysna: Buffalo Bay, *Keet* 427; Woodbourne, *Keet* 751 in F.D. Herb. George: *Compton* 14347 (NBG). Riversdale: S.S.E. of Riversdale, *Acocks* 14592; Albertinia, *Muir* 838. Bredasdorp: Brandfontein, *Smith* 4974; *Taylor* 324 (NBG); Cape Agulhas, *Ecklon* s.n. (only specimen on right hand of sheet), (SAM). Malmesbury: Bok Point, *Compton* 9405 (NBG); Bokbaai, *Esterhuysen* 3840 (BOL). Caledon: *Pole Evans* 4329; Middelvlei Reserve, *Hubbard* 236 (BOL); between Eerste Rivier and Swart Klip, *Pillans* 9211 (BOL); Buffels River Mouth, *Pillans* 8301. Stellenbosch: Strand, *Parker* 3591 and 3662 (BOL). Peninsula: Constantia, *Marloth* 8407; Camps Bay, *Adamson* 571; Cape Town, *Marloth* 7542; Hout Bay, *Acocks* 638; *Bond* 117 (NBG); *Bolus* 13749 (BOL); near Muizenberg, *Schlechter* 1264 (GRA); Uitvlugt, *Muller* in F.D. Herb. 5120 (GRA); Little Lions Head, *Compton* 18583 (NBG); Karbonkelberg, *Esterhuysen* 21172 (BOL); Witsand, *Lotsy* and *Goddyn* 1587 (L).

Endemic to the western and southern coasts of the Cape Province.

The most common habitat of this species is on the sand dunes in coastal bush or scrub forest. It also occurs on limestone hills, such as in Bredasdorp, or in open grass veld or valleys along the coastal belt. It is an easily recognised species with its narrow leaves which are linear oblong, broadest in the upper two thirds and gradually narrowing in the lower half to a short petiole.

The leaves resemble those of *O. africana* in the tendency of the margins to roll backwards but the lower surface in *O. exasperata* appears minutely and densely pitted, not scaly as in *O. africana*. The terminal inflorescence of *O. exasperata* is another distinguishing character between these two species.

In *Sim's Forest Flora of the Cape Colony*, this species is under the name *Olea humilis* Eckl., a latter homonym.

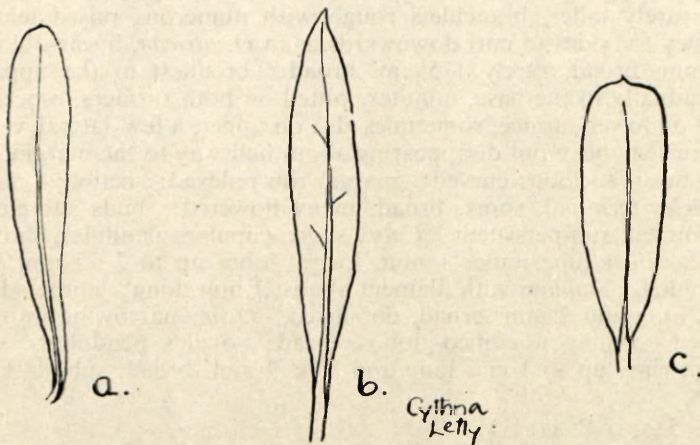


FIG. 5.—*Olea exasperata* Jacq.; a, example of leaf-shape from Constantia; b, from Caledon; c, from Camps Bay.

4. *O. capensis* Linn., aggregate species:(a) subsp. *capensis*.(b) subsp. *enervis* (Harv.) Verdoorn, stat. nov.(c) subsp. *macrocarpa* (C.H. Wr.) Verdoorn, stat. nov.

Trees or shrubs, from shrubby growth about 2 feet high or taller, to trees from 5-35 feet tall, or forest trees up to 90 ft. tall. *Leaves*, light to dark green, undersurface somewhat paler than the upper or sometimes concolorous, occasionally suffused purplish, very variable in texture, size and shape, but not linear or oblong-linear, usually much over 1 cm. broad; petiole green or purplish; margins sometimes faintly to very decidedly undulate, the rim only recurved; scales minute appearing like minute pits especially on under surface; midrib prominent below, at least at base, lateral veins, when visible, forking just beyond halfway to the margin the anastomosing branches looped. *Panicles* terminal and in axils of the 2 upper pairs of leaves, many-flowered, branches glabrous, scaly, variously angled and sulcate; bracts small spreading ovate to subulate about 1 mm. long. *Calyx* cupular 4-toothed or 4-lobed almost to the middle, minutely ciliate. *Corolla* up to 3 mm. long, lobed almost to the base, lobes 4, rarely 3 to 5, ovate-oblong to oblong, rounded at the apex but with a minute incurved mucro and the rather thick margins slightly incurved. *Fruit* sub-globose, ovoid, oblong-globose to oblong-elliptic, rarely at some stages pointed (see Bolus 23227 from Caledon and Pillans 7887 Piquetberg) from 5 mm. long and 4 mm. diam. up to 2 cm. long and 1 cm. diam.

The distribution of this aggregate species, is restricted to southern Africa, that is if the four closely related species in tropical Africa are kept distinct by future workers on the genus. The tropical species are: *O. welwitschii* (Knobl.) Gilg and Schellenb. *O. hochstetteri* Bkr.; *O. urophylla* (Gilg) Gilg and Schellenb.; and *O. guineensis* Hutch. and C.A. Sm. (= *O. hochstetteri* fide Turrill F.T.E.A.), all described later than *O. capensis* L. In appearance, judging from the few tropical specimens seen, these differ in general from the S.A. species in the inflorescences being coarser with their branches thicker and the flowers fewer, which when in bud are broader than long. The differences might also come to be considered as merely subspecific.

After years of study and the examination of material from all the principal herbaria in South Africa and some overseas, including the Royal Botanic Gardens at Kew, the following conclusions were reached: (1) that *O. capensis* L., *O. laurifolia* Lam., *O. enervis* Harv. and *O. macrocarpa* C.H. Wr. of the Flora Capensis comprise one variable and complex species; (2) that the material can be divided into 3 fairly distinct groups, but these groups cannot be given higher rank than that of subspecies because they grade into one another and because in some cases where the habitat of the specimens is not known or there are no mature fruits present it will not be possible to determine to which group the specimen belongs; and (3) that although there is considerable variation within these groups especially in one of them, no further subdivisions can be made at this stage because in no further instances was it found that certain combinations of features were repeated giving a similar appearance to a fair number of specimens and so isolating them as a group; in most cases only single variants were found. The reasons for these conclusions should become more evident from the notes under the sub-species.

- (a) subsp. *capensis*. *O. capensis* Linn. Sp. Pl. Ed. 1: 8 (1753); Dill. Hort. Elthm. t. 160, pl. 194 (1732); Bot. Reg. t. 613 (1822); Harv. ex Wright in Fl. Cap. 4, 1: 487 (1907); Adamson in Fl. of the Cape Peninsula p. 669 (1950); *O. buxifolia* Mill. Gard. Dict. ed. 8 (1768); *O. laurifolia* Lam. III. I: 29 (1791); J. Burm. Rar. Afr. Pl. 233 t. 81 fig. 1 (1739); Harv. ex Wright in Fl. Cap. 4, 1: 487 (1907) pro majore parte, excluding Burchell 5225 (= subsp. *macrocarpa*) and Wood 500 (= subsp. *enervis*); Adamson in Fl. of the Cape Peninsula p. 669 (1950); *O. undulata* Jacq. in Hort. Schoenbr. 1, 1, t2 (1797); var. *planifolia* E. Mey. in Comm. Pl. Afr. Austr. 176 (1837); *O. concolor* E. Mey. in Comm. Pl. Afr. 176 (1837) and in DC. Prod. 8: 286 (1844); *O. laurifolia* Lam. var. *concolor* Harv. ex Wright in Fl. Cap. 4, 1: 487 (1907).

This subspecies is distinguished by the following features: Shrubs or trees, up to 35 ft. tall, not taller forest trees. *Leaves* crowded on herbarium specimens, very variable, obovate-oblong, oblong, broadly oblong, sub-orbicular, elliptic, ovate- to lanceolate-oblong, or obovate- to oblanceolate-oblong; apex broadly rounded, obtuse, sub-acute or acute, sometimes acuminate, usually mucronate; petiole 3 mm. to 1.7 cm. long; midrib prominent on lower surface. *Panicles* compact and densely many flowered. *Fruits* variable in size and shape but not over 1 cm. long and 6 mm. diam.

FIGS. 6, 7 AND 8; PLATES 16, 17 AND 18.

Type: Linnaen Herbarium No. 204, plant from Clifford's garden, originally from "Cape of Good Hope" (see plate 16). Types of synonyms: *O. laurifolia* Lam., specimen in Paris Herbarium (see plate 17); *O. undulata* Jacq., tab. 2, in Jacq. Hort. Schoenbr. 1, 1; *O. undulata* var. *planifolia* E. Mey., Drege, Zuurbergen; *O. concolor* E. Mey., Drege, between Nieuwekloof and Elandskloof, Tulbagh district. (See plate 18).

NATAL.—Port Shepstone: Uvongo, coastal bush, Letty s.n.

CAPE.—Lusikisiki: coast near Umkwani River, Tyson 2657 (SAM); Fraser Falls, Acocks 13431. Kentani: coast, Pegler 994; Pegler 826a (BOL). Komgha: Flanagan 655; Kei Mouth, Schlechter 6194 (GRA). East London; Breyer 23242; Rattray 509; coast, Sim 2102 and 2577 (NH); Bonza Bay, Story 4484; 11 m. W. of East London, Hilner 158 and 268 (GRA); Fort Pato Forest, in F.D. Herb. 1724. King William's Town: Pirie, Sim 1336 (BOL). Somerset East: Zuurberg Pass, Story 2300. Albany: near Hamilton Dam, Dyer 234; Hope Fountain, Acocks 12119; nr. Grahamstown, MacOwen 1210 (BOL); Liebenberg G. 300; Amos Kloof, Galpin 361; Howison's Poort, Zeyher 3377 (BOL). Bathurst: Southwell, Story 3135; 4494; 4495; Salt Vlei near Port Alfred, Story 4491; Kowie, Britten 2850 (GRA). Port Elizabeth: Van Stadens River, Bolus 1210 (BOL); Longmore Forest Reserve, Long 1009; Witteklip, Rodin 1047. Port Elizabeth: Kemsley 257 (GRA); Krakakamma, Zeyher 3378 (SAM); Swartkops River Valley in F.D. Herb. 4445; Hankey Reserve in F.D. Herb. 3952. Uitenhage: Van Stadens Gorge, Long 398; Hoffmankloof to Driefontein, Drege in Ryksherbarium 908161-541 (L); Dornnek and Bontjiesrivier, Zuurberg, Drege (K, L); Addo, Zeyher 547 (BOL). Humansdorp: Klipdrift, Thode A 2492; Clarkson, Thode A959; sanddunes at Slang River, Phillips 3390; Lottering Bush, Zitzikama, Galpin 4322; Storms Rivier Forest, in F.D. Herb. 3928; 4022; 4027; Fourcade 704 (GRA); Groot River Pass, Fourcade 675 (GRA); Ratels Bosch, Fourcade 392 (GRA, BOL). Uniondale: Prince Alfreds Pass, Fourcade 5870 (BOL). Knysna: in forest Theron 981; The Heads, Laughton in F.D. Herb. 8949; Schonland 3575 (GRA); Kaffir Kop Forest, Keet in F.D. Herb. 3566; nr. banks of lagoon, Williamson 30 (GRA); Noetzie Taylor 1224; 1225; Keurboomstrand, Taylor 596; Plettenberg Bay, Smart and Rogers 26812; Belvedere Brenton, Duthie 8 and 620 (GRA); Forests, Duthie 676 (GRA); Portland, Duthie 924 (GRA); near Knysna, Burchell (K, GRA); Kaatjies Kraal, Burchell 5227 (L); Deepwalls, Rodin 1167 (BOL); Taylor 700; Phillips in F.D. Herb. 5487 (3 sheets); Keet in F.D. Herb. 2661 and 3598; Farleigh Forests, Keet in F.D. Herb. 2337. George: Kaaimans

River, *Wilman* s.n.; Jonkersberg, *Burton* in F.D. Herb. 3775 (suggests a touch of "subsp. *macrocarpa*"); Mt. Pleasant, *Martin* 120 (NBG); Groenkop, *Robertson* in F.D. Herb. 7593. Swellendam: Grootvadersbosch, *Marloth* 3524. Bredasdorp: Cape Agulhas, *Galpin* 11254; Road to Stanford, *Maguire* 80 (NBG). Caledon: between Houwhoek Mountains and Palmiet River, *Burchell* 8161, small leafed variant, (K); Grabouw, *Britten* 3111 (GRA); Kogel Bay, *Parker* 4150; Mossel River, *Pots* in S.A. Museum 5051, acuminate; *Potts* 1652, rounded apex, (SAM); near Hermanus, Mossel River, *Guthrie* s.n.; Hermanus, *Burt Davy* 18539 (BOL); Hangklip, *Rodin* 3107; *Bolus* 23227, pointed fruits, (BOL). Somerset West: Hottentots Holland, *Zeyher* 3374 (BOL). Stellenbosch: Sir Lowrys Pass, *Burchell* 8236 (K, L, GRA); *Schlechter* 7267 (GRA). Wynberg: between Wynberg and Constantia, *Burchell* 781 (K). Peninsula: without precise locality *Wallich* s.n. (K); *Sieber* 219; 220 (L); Kirstenbosch, *Zeyher* 182, named *O. undulata* Jacq., (BOL); *Pearson* 16627 and 25303 (BOL); *Kies* 11; *Compton* 10849; 10040 (from various trees pointed leaves and rounded; 10041; 10019 (NBG); *Esterhuysen* 11744 (elliptic-oblong fruits 1 cm. long, leaves broad and rounded at apex); 11834 (fruits up to 1 cm. long, leaves broad); 12853 (small leafed variant); 17516 (some leaves obtuse some acuminate); 264 (NBG); 650 (NBG); 11683, fruits up to 1 cm. long, broad leaves, (NBG); *Henderson* 1408 (NBG); *Compton* 8077 (NBG); *Bond* 82 (NBG); *Pillans* in BOL Herb. 1772, large purple leaves, twigs purple, (BOL); Groote Schuur, *Smuts* 1100 (pointed leaves); 1165 (broad apex); Bishops Court, *Galpin* 4814; Claremont, *Hutchinson* 3; Table Mountain, *Drege* s.n.; *Ecklon* and *Zeyher* 84·7 (some leaves rounded, some acuminate), labelled *O. undulata* Jacq. var. *planifolia*; *Pappe* s.n. (SAM); *Marloth* 5662, 7406, 11926; *Smuts* 1088; *Esterhuysen* 11401 (BOL); *Andreae* 263; *Pole Evans* 4327; 4328; Camps Bay, *Ecklon* and *Zeyher* 69·1; *Prior* s.n.; *Marloth* 7501; *Zeyher* s.n. (K, BOL); Muizenberg, *Bolus* 3904 (BOL); *Pillans* 3706; Adamson 944; *Galpin* 10344; Hout Bay, *Smuts* 1076; *Pillans* 3689; *Lotsy* and *Goddyn* 1929; 1840 and 1867 (L); Orange Kloof, *Wolley Dod* 866; *Marloth* 16628; Noordhoek Forest, *Lotsy* & *Goddyn* 1599 and 1662 (L); Die Kommetjie, *Lam.* & *Meeuse* 4200B (L). Without locality, *Sieber* 219 and 220 (cited in Fl. Cap., former under *O. laurifolia* and later under *O. capensis*, two sheets of each) (L); Simons Bay, *Macgillivray* 665 (K). Paarl: Berg River, source on mountain slope, *Pillans* 8129 (BOL); Happy Valley, Bains Kloof, *Esterhuysen* 12820 (BOL); French Hoek, *Hubbard* 307 (BOL). Ceres: Mitchell's Pass, *Andreae* 214; *Bond* 9 (BOL); exact locality? *Thode* A2268 (leaves small in 3 last named specimens; same tree in Mitchell's Pass?). Tulbagh: between Nieuwekloof and Elandskloof, Twenty-four Rivers, *Drege* s.n.* (type gathering of *O. concolor* E. Mey., 3 sheets in Ryksherbarium, Leiden (L); E. & Z. 77·9 (that is along same route as Drege, passing Nieuwekloof). Piquetberg: Kapiteins Kloof, at base of mountain, *Pillans* 8024, 2 sheets, one fruiting, one flowering (BOL); [*Pillans* 7887 (BOL) from "upper slopes of Kapiteins Kloof" may belong here, distinct appearance suggests hybrid, needs investigation]; Pikeniers Kloof, *Zeyher* s.n. (looks like same collection as the following specimen *Zeyher* 1150) (BOL); *Zeyher* 1150, 3 sheets, cited in Fl. Cap. under *O. laurifolia* var. *concolor* (BOL). Clanwilliam: Grasruggens Nek, *Pillans* 8716.

Not known to occur outside South Africa.

This subspecies includes a large number of specimens from the coastal regions of the Cape, stretching from the borders of Natal southwards and westwards to the Peninsula and northwards to Clanwilliam. The leaves of the specimens vary very much in texture, shape and size, but all attempts at grouping specimens with more or less similar leaves failed completely. This was not only because intermediates are found between all extremes, but also because the variations in leaves do not combine with any other feature to form a recognisable group.

* The specimen in the National Herbarium, Pretoria, supposed to be the same Drege gathering, is not an *Olea*.

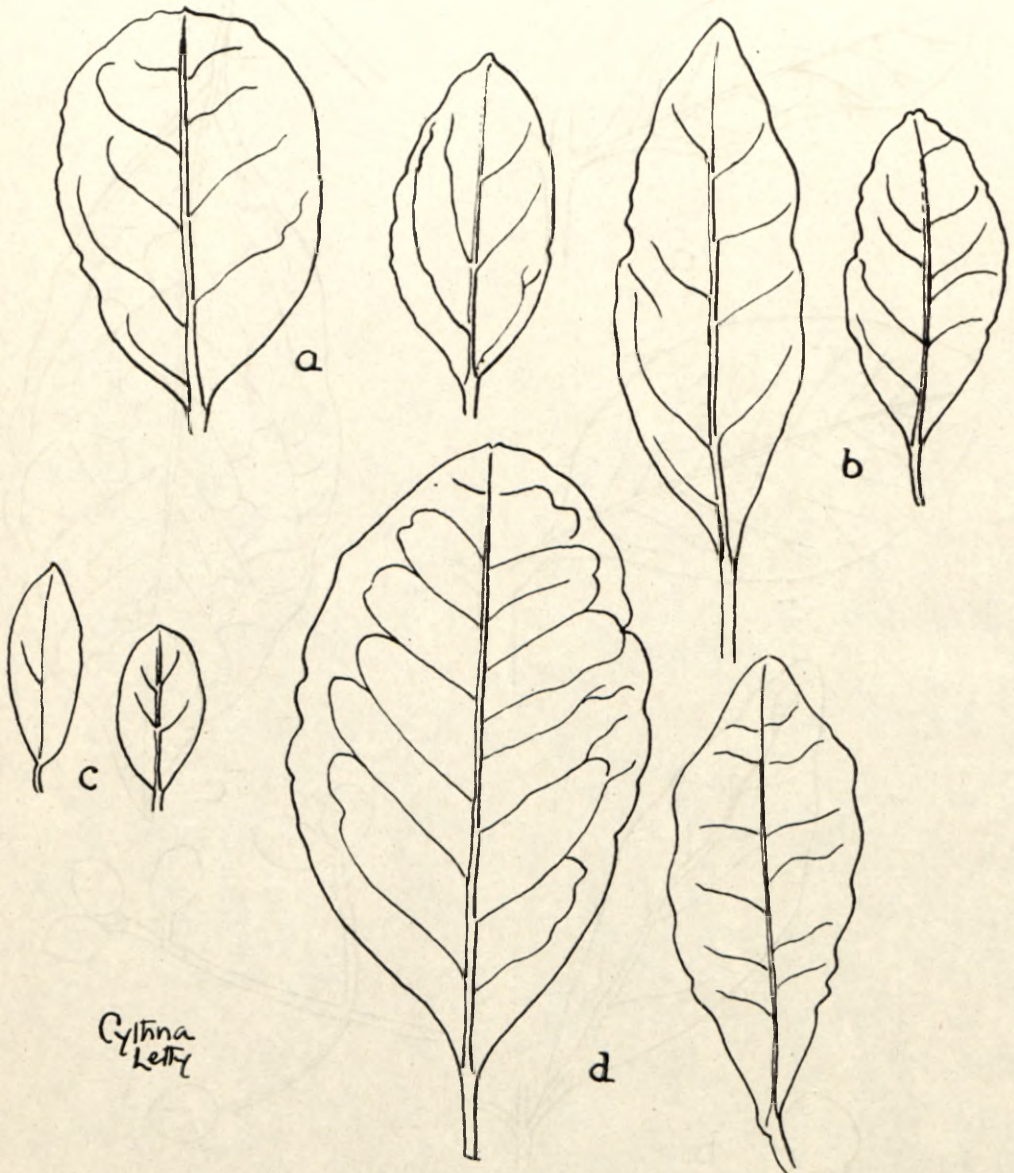
Of the name changes necessary in this revision the one that will cause some upset and needs explanation is the sinking of *O. laurifolia* Lam. under *O. capensis*. This is because (1) the features given as the distinguishing characters seem to work well, since some specimens have leaves broadly obtuse while others narrow to a sub-acute or acute apex, and (2) the name *O. laurifolia* has wrongly come to be applied to the forest tree here classified as *O. capensis* subspecies *macrocarpa*. The leaves of this forest tree are somewhat similar in shape to those of several specimens from the Peninsula which would fall under *O. laurifolia* Lam. (cfr. figs. 8a and b with leaf shapes on fig. 10), but the fact that the forest tree produces large elliptic fruits is, in my opinion, more diagnostic than similarity in leaf-shape. The figure of *O. laurifolia* cited by Lamarck (tracing of a leaf and fruit of this figure is reproduced here, see fig. 6b) is described by Burman (Rar. Afr. pl. 233) as having "thick" leaves which are "almost sessile" and "rotund fruits" of the size of the drawing, all of which does not describe the forest tree (see for instance its long petioles, pl. 20). Throughout the 200 odd years of collecting no specimens with fruits larger than the one figured has been collected anywhere in the Cape except in the forests at Knysna or similar forests to the east. Therefore the name *O. laurifolia* Lam. cannot be applied to the forest tree with large fruits.

Having settled this point, it still remains to be explained why *O. laurifolia* cannot be separated from *O. capensis* at least as a variety. The examination of the types of the two species (Pl. 16 and 17) and of the drawings of leaves from a number of specimens collected in a fairly circumscribed area at or near Kirstenbosch (Fig. 7 and 8), will help to elucidate this. From each specimen two leaves were drawn, a small and large one. On Fig. 7, a and b, the small leaves are very similar but in the one case (Fig. 7a) they develop into a leaf with a very broad apex (like typical *O. capensis*, see Fig. 6a), and in the other (Fig. 7b) into a leaf which narrows slightly to a blunt point, very like typical *O. laurifolia* (see Fig. 6b). Similar pairs of leaves from different plants in the Kirstenbosch area show an even greater diversity in the shape of the full grown leaf than those of the types (see Figs. 8a-g and compare with photos of the types on plates 16 and 17). All these specimens whether small- or large-leaved, rounded or acute at the apex, wavy or not on the margins, are considered by the local botanists, who know the growing plants, to belong to a single species. In the same way taxonomists working with the pressed specimens have found it impossible to group them and distinguish the groups from each other. Among these heterogeneous specimens or within their range of variation would fall the type of *O. undulata* Jacq. (see Fig. 6c) which was sunk under *O. laurifolia* in the Flora Capensis and now is a synonym of *O. capensis*.

It was not quite so easy to decide whether *O. concolor*, from Tulbagh, is synonymous with *O. capensis*. The isotypes, Drege s.n., which were seen among the specimens sent on loan from Kew and the Ryksherbarium, Leiden, look rather distinct (see Pl. 18 and Fig. 8c). Most of the leaves are rather small, broadest in the upper half, long cuneate to the base and abruptly narrowed near the apex into a cusp-like acumen. After examining all other available specimens from the regions north of the Peninsula, it was obvious that here too were odd variants that could not be grouped together (see Fig. 8c-g). To illustrate, Wright in the Flora Capensis cites under *O. laurifolia* var. *concolor* Harv., with the type (Drege s.n.) a specimen Zeyher 1150 from Piquetberg. This latter specimen has a long leaf, broadest about the middle and long tapering to base and apex (see Fig. 8d), quite unlike the type of *O. concolor*. From Piquetberg came also two specimens, Pillans 7887 (see Fig. 8e) "from upper slopes", with leaves very like the type of *O. concolor*, and Pillans 8024, from "base of mountain", with very different leaves (see Fig. 8g). From Clanwilliam, the most northerly locality known, comes yet another form of leaf (see Fig. 8f). Most of these specimens from the northern districts, with the possible exception of Pillans 7887 which should be investigated (especially from the point of view of possible hybridization with *O. exasperata*), are best included as variants in the complex subspecies *O. capensis* L. subsp. *capensis*.



FIG. 6.—*Olea capensis* L. subsp. *capensis*; *a*, leaves from the figure in Dill. Elth. t. 160, cited with the original description of *O. capensis* L.; *b*, leaf and fruit from the figure in J. Burm. Rar. Afr. Pl. t. 81, fig. I, cited with the original description of *O. laurifolia* Lam.; *c*, leaf and fruiting inflorescence from the figure in Jacq. Hort. Schoenbr. I, I, t2, the type figure of *O. undulata* Jacq.



Cytha
Letty

FIG. 7.—*Olea capensis* L. subsp. *capensis*. Samples of leaf-shapes from specimens growing on the Peninsula, 2 from each specimen, to show the range of variation; *a*, Drege s.n. Table Mountain; *b*, E. & Z., mountains round Cape Town; *c*, Esterhuysen 12853, Kirstenbosch; *d*, Esterhuysen 11744, Kirstenbosch.



FIG. 8.—*Olea capensis* L. subsp. *capensis*. Examples of various leaf-shapes; *a*, two leaves, Smuts 1100, Groote Schuur; *b*, Marloth 5662, Table Mountain, like "*O. undulata*"; *c*, isotype of *O. concolor*, Drege, Tulbagh district; *d*, Zeyher 1150 cited in *Fl. Cap.* as "*var. concolor*"; *e*, Pillans 7887, Kapiteins Kloof, Piquetberg; *f*, Pillans 8716, Clanwilliam; *g*, Pillans 8024, also from Kapiteins Kloof.

Besides the variants from Kirstenbosch and the northern districts, there are others that could be mentioned, such as the specimens with pointed fruits, that seem to occur haphazardly, and certain growth forms.

Among the latter is a low, shrubby, sea-side form described in one instance by the collector, John Phillips, as an "impenetrable hedgelike consocieties 12-36 in. high". The leaves on such plants are usually large and thick and broadly rounded at the apex. Investigation with the help of Forest Officers shows that the appearance is probably caused by environment and in the early stages of growth. The particular patch described by John Phillips as 12-36 in. high is today, 20 odd years after, 6 to 8 feet high with smaller leaves, while a little deeper inland are small trees that link this form with the normal tree.

With regard to the common name, the most generally used is "Black Ironwood". A record exists that in the Tzitzikamma it is known as "Lemoen Ysterhout" owing to the yellowish colour of the underside of a fresh leaf. This yellow colour of the leaf-undersurface is probably another example of the variations possible in this subspecies; the notes usually describe the leaves as lighter on the undersurface, but there are quite a number which are reported to have concolorous leaves while in a few cases they are described as purplish beneath.

(b) subsp. *enervis* (Harv.) *Verdoorn* stat. nov., *O. enervis* Harv. in Wright in Fl. Cap. 4, 1: 488 (1907); *O. laurifolia* Harv. ex Wright in Fl. Cap. 4, 1: 487, in part (*Wood* 500) non Lam.

The essential features by which to distinguish this subspecies are the flatter leaves of more uniform size and shape (compare drawings in Fig. 9 with those in Figs. 7, 8 and 10), on the average broadly elliptic, very rarely oblong elliptic, 4-5 cm. long and 1.5-2.5 cm. broad; the short petiole; pale branchlets; lower leaves on herbarium specimens deciduous, leaving prominent scars; and the midrib usually prominent only in the basal half on the undersurface.

PLATE 19 & FIG. 9.

Type: *Gerrard* 1151, from between the "Buffalo River and Mooi River", that is probably in the Msinga district, Natal.

TRANSVAAL.—Soutpansberg: near Lake Funduzi, *Gillett* 3085 (BOL); *Story* 4857. Pietersburg: Blaauwberg, *Codd* 8694; 8695; *Codd and Dyer* 9001; *Bremekamp and Schweickerdt* 112. Rustenburg: Breedsnek, *Repton* 3905; Pisangkloof, *Rose-Innes* 23254 (J). Brits: Kloof in Magaliesberg opposite Wolhuterskop turn-off, *Story and Rose-Innes* 1392; *Marais* 279 and 285. Waterberg: Groothoek, *Codd* 3955; Hangklip, *Maguire* 1441 (BOL). Potgietersrust: near Potgietersrust, *Galpin* 8827; between Potgietersrust and Palala, *Pole Evans* s.n.; S.E. of Palala, *Story* 1667; Bokpoort, *Codd* 2364; *Galpin* 11685. Lydenburg: Sekukuniland, *Barnard* 502; 270; *Barnard and Mogg* 80, 768, 1003; *Mogg* 16908; 16888; *Moss* 22464; *Van Warmelo* 93; 105; Steelpoort, *Keet* in F.D. Herb. 6058; Mooihoek Chrome Mine, *Codd & Dyer* 7701. Barberton: between Louws Creek and Maid of the Mist Mountain, *Hutchinson* 2434; Rimers Creek, *Thorncroft* 2005; Berlin Plantation, *Keet* 6728; *Thode* A1622, leaves rather too long acuminate?

SWAZILAND.—Lebombos, east side, *Hornby* 2830.

NATAL.—Ingwavuma: *Gerstner* 3774 (NH); Melmoth: Entonjaneni, *Gerstner* 2685 (NH). Nkandhla: Qudeni, *Gerstner* 3572, one specimen on sheet with all small leaves, as on type specimen, (NH), *Davis* 113 (NH). Weenen: Umhlumba Mountain, west slopes, *Acosks* 10615; Blaauwkrans River, *Pentz* 218. Msinga: Buffalo River and Mooi River, *Gerrard* 1151, holotype (K); isotype, the majority of leaves small, (PRE). Eshowe: Ngoya, *Boocock* in F.D. Herb. 5992. Ndwedwe: Inyoni Hill, *Oliver* 502; Inanda, *Medley Wood* 500 (cited in Fl. Cap. under *O. laurifolia*). Pinetown: Umzinyati, *Medley Wood* 11443. Port Shepstone: Lower Umzimkulu, *Medley Wood* 11596, 9982 (NH).

Not known to occur outside South Africa.

This subspecies occurs in the bushveld of the Transvaal and Swaziland and the dry inland regions of Natal. Although falling within the range of characteristics of *O. capensis* L., specimens from these regions show a certain similarity in general appearance that makes them distinguishable from the rest. Because the differences are merely differences of degree and because occasionally specimens from the eastern Cape are almost indistinguishable this group has been given the rank of subspecies.

The type specimen of *O. enervis* Harv., that is now the type of this subspecies, Gerrard 1151 (see Fig. 9a), has leaves on the whole smaller than the average (see Fig. 9c-f), but they are within the range of size and may be matched with one or two of the leaves on any average specimen of the subspecies.

Gerrard 1151 was collected between the Buffalo and Mooi Rivers in Natal, that is probably in the Msinga district which lies between the Weenen and Nkandhla districts, from which specimens obviously belonging to this group have been collected, for instance Gerstner 3572, collected at Qudeni, Nkandhla.

The majority of the leaves on the flowering branches of Gerstner 3572 are small like those on the type specimen (see left hand leaf of Fig. 9b), while on a branch on the same sheet most of the leaves are much bigger (see right hand leaf of Fig. 9b). Fig. 9c depicts an average leaf from a specimen from Weenen and Fig. 9d is of a specimen from Rustenburg in the Transvaal. Lastly Figs. 9e and 9f are drawings of representative leaves from two different specimens collected on the Blaauwberg.

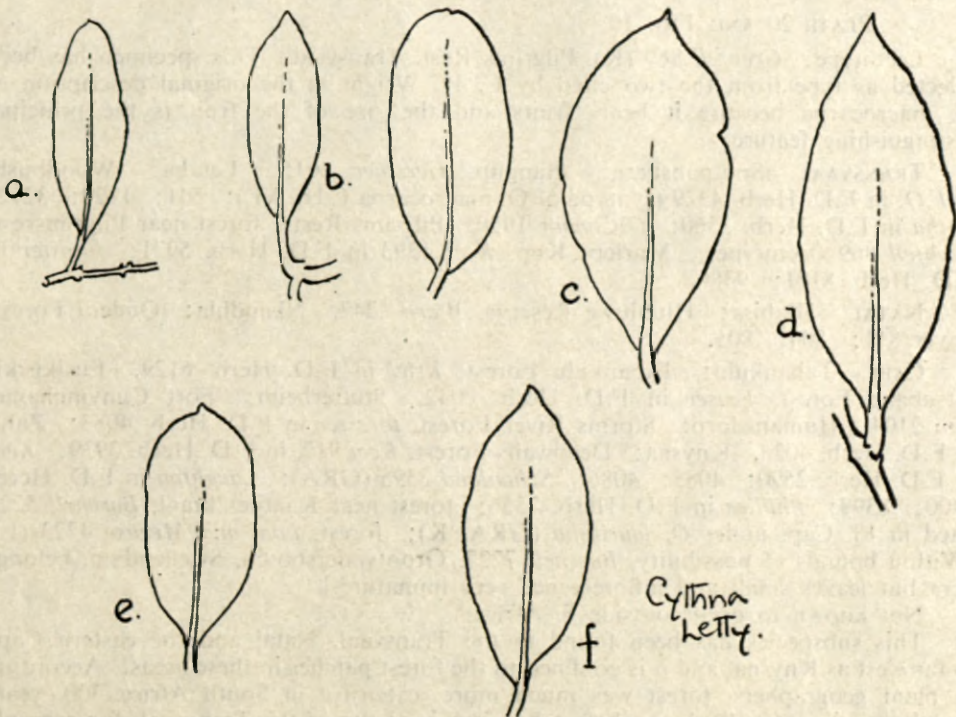


FIG. 9.—*Olea capensis* L. subsp. *enervis* (Harv.) Verdoorn. Examples of leaves showing range in size and shape; *a*, leaf from type specimen, Gerrard 1151, between Buffalo and Mooi Rivers, Natal; *b*, two leaves from Gerstner 3722, Qudeni, different size and shape from same gathering; *c*, Acocks 10615, Weenen; *d*, Codd 2364, Bokpoort; *e*, Codd 8695, Blaauwberg; *f*, Codd 8694, Blaauwberg.

A single specimen Gillett 3085 from near Lake Funduzi, has rather unusual leaves, being mostly narrowly oblong, rounded at apex and base and with the midrib prominent. Investigation has proved that this specimen, which is in the Bolus Herbarium, is not representative of the trees there, the leaves of which are on the whole more typical. Another specimen that differs somewhat from the general pattern is a specimen from Barberton, Thode A1622, in which the leaves are rather long acuminate to an acute apex.

(c) subsp. *macrocarpa* (C.H. Wr.) Verdoorn, stat. nov. *O. macrocarpa* C.H. Wr. in Fl. Cap. 4, 1: 1129, addenda, (1909) and in Kew Bull. p. 186 (1909). *O. laurifolia* Sim, Forest Flora of C.C. 264, t. 106 (1907) pro parte, fig. incl.; Harvey ex Wright in Fl. Cap. 4, 1: 487 (1907) pro minore parte e.g. Burchell 5225; J. Phillips in Trans. of the Royal Soc. of S. Africa, 16: 170 and 180 (1928); Acocks in Veld Types of S. Africa p. 36 and 122 (1953), non Lam.

Forest trees, sometimes up to 90 feet tall, ultimate branchlets slender (in herbarium specimens branchlets somewhat longer and more slender, with leaves less crowded than specimens of "subsp. *capensis*"). Leaves usually narrowly elliptic, tapering to the base and apex, sometimes fairly broad a shortly acuminate to base and apex, 5-10 cm. long and 1-3.5 cm. broad; apex often acute with subulate point, sometimes obtuse; petiole 1-2 cm. long, often dark in lower half (purple when fresh?) usually patently spreading. Panicles many flowered but not very compact. Calyx shortly 4-toothed, lepidote-pitted, minutely ciliate. Fruit purple when mature, 1.5-2 cm. long and .6-1.1 cm. diam.

PLATE 20 AND FIG. 10.

Lectotype: *Grenfell* 869 (K), Pilgrims Rest, Transvaal. This specimen has been selected as type from the two cited by C. H. Wright in the original description of *O. macrocarpa* because it bears fruits and the size of the fruit is the principal distinguishing feature.

TRANSVAAL.—Soutpansberg: Hanglip, *Gerstner* 6015. Letaba: Woodbush, *D.F.O.* in F.D. Herb. 4329 (syntype of *O. macrocarpa* C.H. Wr.); 541; 1129; 3272; *Botha* in F.D. Herb. 3560; *O'Connor* 1920. Pilgrims Rest: forest near Pilgrimsrest, *Grenfell* 869 (lectotype); *Marieps Kop*, *Keet* 1393 in F.D. Herb. 5971; *forester* in F.D. Herb. 8101; 9386.

NATAL.—Hlabisa: Hluhluwe Reserve, *Ward* 2247. Nkandhla: Qudeni Forest, Bayer 811; 804; 805.

CAPE.—Tabankulu Forest, *Kriel* in F.D. Herb. 6129. Lusikisiki: Ntsubane Forest, *Fraser* in F.D. Herb. 6042. Stutterheim: Fort Cunymghame, *Sim* 2104. Humansdorp: Storms River Forest, *forester* in F.D. Herb. 4083; *Zahn* in F.D. Herb. 4026. Knysna: Deepwalls Forest, *Keet* 917, in F.D. Herb. 3939; *Keet* in F.D. Herb. 2590; 4085; 4086; *Schonland* 3595 (GRA); *Laughton* in F.D. Herb. 8400; 8399; *Phillips* in F.D. Herb. 7356; forest near Kaatjies kraal, *Burchell* 5225 cited in Fl. Cap. under *O. laurifolia* (GRA, K); forest, *Lam and Meeuse* 4723 (L). [Within bounds of possibility, *Burchell* 7227, Grootvadersbosch, Swellendam, belongs here but leaves small and inflorescence very immature.]

Not known to occur outside S. Africa.

This subspecies has been found in the Transvaal, Natal and the eastern Cape as far west as Knysna, and it is confined to the forest patches in these areas. According to plant geographers, forest was much more extensive in South Africa 300 years ago than it is now. Today only patches remain, some in the Transvaal, for example at Woodbush and Marieskop, in Natal, as at Qudeni, the Transkei, at Tabankulu, and the well known patches at Knysna and George. Some less well known patches may be found further west, such as the one at Grootvadersbosch in the Swellendam district. In the north eastern areas these forests are on the mountain ranges but in the south they are along the coastal belt.



FIG. 10.—*Olea capensis* L. subsp. *macrocarpa* (C.H. Wr.) Verdoorn; *a*, leaf and fruits from isotype, Pilgrimsrest; *b*, specimen from Marieps Kop; *c*, specimen from Hluhluwe, Natal; *d*, specimen from Knysna.

The identification of the forest trees at Knysna, which bear large fruits and which had erroneously come to be called *O. laurifolia*, with *O. macrocarpa* C.H. Wr. of the Transvaal, is fully supported by Dr. John Phillips who, as an officer of the Department of Forestry stationed at Knysna, wrote the following in 1928: "The foliage of the so-called *O. macrocarpa* C.H. Wr. from the Zoutpansberg, anatomically is indistinguishable from that of *O. laurifolia* [meaning the forest tree with large fruits]. This fact, together with the similarity in the anatomy of the 'bark' and the similarity in the flowers and fruits, leads the writer to think that the plants are co-specific" (Trans. Roy. Soc. of S.A. 14: 179).

In the Knysna forest, subsp. *capensis* overlaps in its distribution with subsp. *macrocarpa*. There do not seem to be any notes by foresters or forest officers about hybridization but there are remarks about the difficulty of distinguishing between the two, which they referred to as "*O. capensis*" and "*O. laurifolia*" respectively.

In the same paper mentioned above Phillips writes: "The foliage of *O. laurifolia* and *O. capensis* [meaning subsp. *macrocarpa* and subsp. *capensis*], in the absence of flowers and fruits, is often confused by botanists and foresters. The leaves of these species are readily distinguished in that the walls of the dorsal epidermal cells of *O. laurifolia* (sic) present a definitely wavy appearance in superficial section whereas *O. capensis* shows stouter non-wavy walls".

As pointed out in this work there is a great deal of variation in subsp. *capensis* and in many cases, when it was thought that features had been found by which to separate it from subsp. *macrocarpa*, when still more material had been examined it was found that the differences did not hold. In like manner the feature of the wavy cell walls found by Dr. Phillips might break down if a large number of specimens are examined.

The similarity of the leaf shape in subsp. *macrocarpa* with a few specimens of subsp. *capensis* can be seen if those on Fig. 10 are compared with some on Figs. 7 and 8. (Compare Fig. 10a, a drawing of a leaf and fruit from the isotype of subsp. *macrocarpa* in the Bolus Herbarium with the leaf-shape of Fig. 8a, *Smuts* 1100, from Groote Schuur).

The leaf, Fig. 10b, from a Mariepskop specimen, shows the attenuate point that is quite frequently found in this subspecies, but never in subspecies *capensis*. In this character it approaches the leaf-shape of *O. woodiana* (see Fig. 4). It will be seen from the 4 figures on Fig. 10 that in subsp. *macrocarpa* there is more uniformity of leaf-shape than in subsp. *capensis*.

The common name "Ironwood", "Ysterhout", is usually applied to subsp. *macrocarpa* but sometimes it is also called "Black Ironwood", the common name for subsp. *capensis*.

4. LINOCIERA.

Sw. in Schreb. Gen. Pl. 2: 784 (1791) nomen conservandum. Benth and Hook. in Gen. Pl. 2, 2: 678 (section *Ceranthus*); Bkr. in Fl. Trop. Afr. 4, 1: 19 (1904); Turrill in F.T.E.A. (1952). *Olea* Phill. Gen. S.A. Fl. Pl. ed. 2: 572 (1951) in part, not Linn.; Harvey ex Wright in Fl. Cap. 4, 1: 485 (1907) in part. *Dekindtia* Gilg in Bot. Jb. 32: 139 (1902); Turrill in F.T.E.A. (1952). *Campanolea* Gilg & Schellenb. in Bot. Jb. 51: 73 (1914).

Trees, small to large forest trees. *Leaves* variable in size and texture, often large, usually oblong to elliptic or obovate-oblong, opposite, entire, minutely and sparsely lepidote, especially on undersurface, usually with acarodomatia in the axils of the veins beneath. *Inflorescence* axillary, often on previous as well as on this years growth, cymes sessile or more often paniculate and laxly flowered, peduncles sometimes reduced or absent giving the impression of fascicled inflorescences; pedicels also sometimes reduced and flowers then appear glomerate. *Calyx* deeply lobed sometimes to the base, lobes broad to rounded at the apex, densely setulose pubescent to glabrous

without. *Corolla* with a very short tube or lobed to the base, sometimes lobes cohering in pairs (with stamen inserted between them) but tube slit to the base between the pairs; lobes with margins deeply infolded and so usually appearing longer than broad, cucullate at the apex (in African species). Stamens 2 (rarely 4 found in some flowers), anthers shorter than the corolla-lobes (in African species; as long as, and enveloped by the corolla-lobes, in the typical species); anther basifixed. *Ovary* sometimes hispid, subglobose, narrowed into a short style, sometimes up to as long as, or slightly longer than the ovary; stigma sub-capitate, obscurely bi-lobed; ovules collateral, attached ventrally (in typical *Linociera* attached at apex). *Fruit* a drupe with a thin fleshy layer, endocarp rather hard and with a large seed cavity; seed usually solitary, no endosperm, cotyledons thick.

FIG. 11.

Type species: *L. ligustrina* Sw., from the West Indies.

The above generic description was drawn up from all available tropical African as well as South African material because the species throughout Africa form a definite group and obviously belong to the same genus. This group and the features by which it differs from *Olea* were obviously not recognised by past workers. For instance (1) several members of the group were originally in the genus *Olea*, such as *O. foveolata* and *O. peglerae* in South Africa; (2) one typical *Olea* in tropical Africa was at one time in the genus *Linociera*, *O. welwitschii* (Knobl.) Gilg & Schellenb.; and (3) recently in the Flora of Tropical East Africa, where *Olea* and *Linociera* are both maintained, a species which fits best in the latter genus is included in the former, *O. mildbraedii* (Gilg and Schellenb.) Knobl.

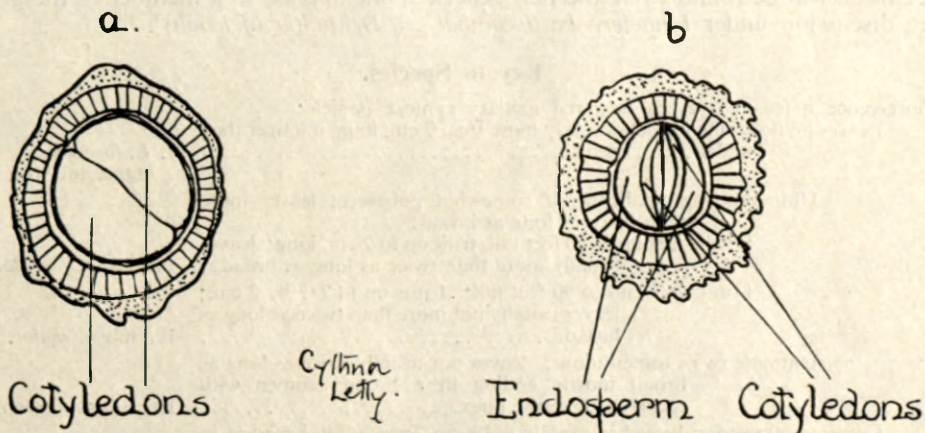


FIG. 11.—Transverse sections of fruits; *a*, *Linociera battiscombei*, showing thick cotyledons and no endosperm; *b*, *Olea capensis* L. subsp. *macrocarpa*, showing thin cotyledons in endosperm.

The question as to which of the two genera this group should belong is a moot one. The species comprising it are no more typical of *Linociera* than of *Olea*, but could form a section in either or constitute a separate genus. The reasons for here putting them under *Linociera* rather than *Olea* are because (1) both in Africa, including the Mascarenes, and in the East (India, Burma, China and New Guinea, etc.), similar specimens are placed in this genus (see especially Flora of Tropical East Africa, 1952), and (2) in Bentham and Hooker's General Plantarum this group cannot be put under *Olea* on account of the ex-albuminous seeds, whereas it can be fitted into the section *Ceranthus* of *Linociera*.

The decision to leave the group under *Linociera* instead of giving it generic rank was made because, to take the latter course, would require an investigation of all the synonyms and related genera and an examination of specimens of *Linociera* in both the Old and the New World. Since this is not possible at this stage, the group is characterised and defined as clearly as possible and is treated in such a way that any future worker will be able to move it as a whole to whatever position in the family he considers the correct one. The combination of characters used in the key to separate this group in *Linociera* from the genus *Olea* seem to be sound and divide the specimens into two natural classes. In one species from tropical Africa, *Linociera latipetala* M. R. F. Taylor, one of the most useful distinguishing characters breaks down to a certain extent, the corolla segments are not much longer than broad but the other characteristics are present, such as acarodomatia on the leaves, the infolded margins of the corolla lobes and the ventrally attached ovules. There can be no doubt that in spite of this one feature it belongs to the group under discussion. This species was the basis for Gilg and Schellenberg's monotypic genus *Campanolea* and was described by them as *Campanolea mildbraedii* in 1913. In 1932 it was transferred to *Olea* by Knoblach. In 1940 Taylor described *Linociera latipetala*, which is obviously the same species and which Turrill cites together with *Campanolea mildbraedii* as a synonym of *Olea mildbraedii* (Gilg and Schellenb.) Knobl. Since there is already a *Linociera mildbraedii* Gilg and Schellenb., under this genus it becomes *Linociera latipetala* M. R. F. Taylor. Having access to the specimen *Dummer* 5473 which is cited by Taylor, this study of the species was made possible and provided the authority for sinking the genus *Campanolea*.

If future workers decide on giving this group generic rank it is possible that *Dekindtia* will be found to be the first generic name applied to a member of the group [see discussion under *Linociera battiscombei* (= *Dekindtia africana*)].

Key to Species.

- Inflorescence a few- to several-flowered axillary cymose panicle:
 Leaves on flowering branches rarely more than 7 cm. long, if longer then under 3 cm. broad..... 1. *L. foveolata*,
 (aggregate sp.).
- Ultimate twigs glabrous, if somewhat pubescent leaves more than twice as long as broad:
 Small trees up to 30 feet tall, fruit up to 2 cm. long; leaves usually more than twice as long as broad.. 1a. subsp. *foveolata*.
 Forest trees up to 90 feet tall; fruits up to 2.7 by 2 cm.; leaves usually not more than twice as long as broad..... 1c. subsp. *major*.
 Ultimate twigs tomentulose; leaves not usually twice as long as broad mostly ending in a broad acumen with recurved or retuse apex..... 1b. subsp. *tomentella*.
- Leaves on flowering branches usually 9-13 cm. long, often broadest in upper half, narrowing gradually to the base, shortly acuminate to the apex and abruptly narrowed into a broad obtuse 5-10 mm. long acumen; petioles 1 cm. or more long..... 2. *L. peglerae*.
- Inflorescence a reduced cyme with flowers sub-sessile and appearing glomerate in the leaf axils; young inflorescences densely pubescent sessile globules; calyx segments up to 4.5 mm. long; trop. African species..... 3. *L. battiscombei*.
1. *L. foveolata* (E. Mey.) Knobl., aggregate species.
 (a) subsp. *foveolata*.
 (b) subsp. *tomentella* Verdoorn subsp. nov.
 (c) subsp. *major* Verdoorn subsp. nov.

Small trees, sometimes up to 30 feet tall or forest trees up to 90 feet tall. Ultimate twigs short, usually with 2 pairs of leaves, glabrous, or tomentulose. *Leaves* varying in size and texture, glabrous or sparsely pubescent at base and on midrib, ovate-oblong, oblong-elliptic, or oblong, rounded or shortly cuneate at base (in coppice shoots rounded to cordate at base), shortly or gradually narrowed to an obtuse apex, or with a broad, sometimes retuse, acumen at apex, 2–7 cm. long (if longer then under 3 cm. broad) and 1.3–3.7 cm. broad, very minutely and obscurely scaly, especially on lower surface, appearing as if minutely pitted, acarodomatia usually present in the axils of the leaves below; petiole 2–7 mm. long. *Inflorescence* short, laxly flowered, cymose panicles, axillary and on the old wood, glabrous, or bracts and calyces setulose, glabrescent, 0.5–3 cm. long, peduncles sometimes reduced, giving the appearance of fascicled inflorescences. *Calyx* 4-lobed to beyond the middle; lobes rounded at the apex, usually ciliate. *Corolla* white sometimes tinted pink, sweetly scented, 4-lobed almost to the base and between alternate lobes right to the base; lobes about 4 mm. long with margins deeply infolded and apex cucullate (like a mocassin toe), appearing longer than broad. *Stamens* normally 2 (4 found in some flowers), inserted on the short tube between alternate lobes, filaments fused on corolla-tube and only slightly longer than it; anthers about 1.75 mm. long and 1.5 mm. broad. *Ovary* subglobose, stigma subcapitate, obscurely 2-lobed; ovules 2, attached ventrally, usually near the base. *Fruit* green turning blackish or purplish black when mature, sub-globose to oblong, 1.5–2.8 cm. long and 0.8–2 cm. broad.

The aggregate species, *Linociera foveolata*, is characterised by the comparatively small leaves, seldom over 7 cm. long but if so then under 3 cm. broad and the laxly flowered, glabrescent, axillary panicles, usually 1 to 3 cm. long.

This species divides naturally into 3 groups and these groups have been given the rank of subspecies because although distinguishable seem to be more closely related to each other than to the other species of *Linociera*, also the distinguishing characters occasionally grade into each other and while in general it will be easy to decide to which subspecies a specimen belongs there will be some cases when it will not be possible, although the specimen could doubtlessly be classified as *L. foveolata* in the broad sense.

The distribution of the three subspecies can be seen on the map reproduced here as fig. 12.

(a) subsp. **foveolata**. *L. foveolata* (E. Mey.) Knobl. in Repert. Nov. Spec. 41: 151 (1937); *Olea foveolata* E. Mey. Comm. Pl. Afr. Austr. 176 (1837); DC. Prod. 8: 285 (1844); Harv. ex Wright in Fl. Cap. 4, 1: 485 (1909) pro parte; *L. marlothii* Knobl. in Repert. Nov. Spec. 41: 151 (1937).

The typical subspecies is distinguished by its glabrous or sparsely pubescent branchlets, never tomentulose; its leaves usually more than twice as long as broad, shortly acuminate to an obtuse apex; and the fruit usually under 2 cm. long and 1.1 cm. broad but not larger.

PLATES 21 AND 22.

Type: Drege s.n., from "between Hoffman Kloof and Driefontein" in the Zuurbergen, Uitenhage. Type of synonym: *L. marlothii*, Knobl., *Rudatis* 1416, Dumisa, Natal.

TRANSVAAL.—Lydenburg: Waterfall, *Codd & Verdoorn* 7613; Groblersdal: Loskop Dam, *Codd* 8434. Rustenburg: near Ananda Guest Farm, *Rose Innes* 207, 211, 286; *Marais* 280, 281, 286. Brits: Magaliesberg, opposite Wolhuterskop turn off, *Marais*.

NATAL.—Ingwavuma: Gwoloweni Forest, *Bayer* 765. Entonjaneni: Umhlatuzi Valley, *Lawn* 1925 and 1927, fruit rather large, 2 cm. long and 1.2 cm. broad (NH). Estcourt: Dalton Bridge, *Wright, West* and *Acocks* 12; Umhlumba Mountain, *West* 1463; Tabamhlope, *West* 1135. Ndwedwe: Groenberg near Inanda, *Wood* 1290. Pietermaritzburg: Impendhle, *Acocks* 13772; Emkazeni, *Houshold* in F.D. Herb. 3180; Polela: Bulwer, *Good* in F.D. Herb. 6121; *Boocock* in F.D. Herb. 4101 (narrow leaf variant); Emkayeni forest, *Fernando* 91. Umzinto (Alexandra): Umgaye, Dumisa, *Rudatis* 1416, isotype of *L. marlothii* Knobl. (3 sheets).

CAPE.—Umzimkulu: *Miller* in F.D. Herb. 6123; Adam forest, *Leigh* in F.D. Herb. 6123 (long, narrow rather thin leaf, like *L. marlothii*); Insikeni: Dlokolwana forest, *Miller* in F.D. Herb. 6048. Libode: Hobokazi forest, *Miller* in F.D. Herb. 6048. Komgha: in woods, *Flanagan* 270 (3 sheets). Stutterheim: Fort Cunynghame, *Sim* 2103; Kabaku Hills, *Acocks* 8964. East London: in Queens Park but wild, *Galpin* 8219; *King* 1. Keiskamahok: Mpamba, *Stayner* 52. King Williams Town: Pirie, *Sim* 1334 (BOL). Albany: Fern Kloof, *Story* 4497, 4498; *Britten* s.n. (GRA). Bathurst: Kowie, *Britten* 1847. Alexandria: south of town, *Story* 270. Port Elizabeth: Longmore Kloof, *Taylor* 840. Uitenhage: Zuurbergen between Hoffmanskloof and Driefontein, *Drege* s.n., isotype (*L.*).

Not known to occur outside South Africa.

An isotype of the species, *Drege* from the Zuurberg, labelled in Meyer's handwriting "*O. foveolata* E. Mey." and seen by Knoblauch was sent on loan to the National Herbarium, Pretoria, from the Ryksherbarium, Leiden (see pl. 21). An examination of this specimen showed that it compared well with specimens from regions eastwards and northwards of this locality, but not to the west of it. These specimens, although varying within limits, form a definite group, which is distinguishable from certain plants found on the Peninsula, at Knysna and elsewhere which, both *Wright* in the Flora Capensis and *Adamson* in the Flora of the Cape Peninsula, confused with *O. foveolata* E. Mey. The main distinguishing feature of these two groups is the glabrous ultimate branchlets in the group containing the *Drege* specimen, and the tomentulose branchlets of the group in which specimens from the Peninsula are found. Added to this the leaves in the former group are usually more than twice as long as broad, narrowing evenly to an obtuse apex and with the lateral veins not spreading very widely, as opposed to the rather broad (not twice as long as broad) leaves, shortly narrowed towards the apex, and then abruptly narrowed into a broad retuse acumen, with the lateral nerves widely spreading, in the tomentulose group, described below as a new subspecies.

Of the three subspecies, *L. foveolata* subsp. *foveolata* is the commonest and the most widely spread. It is also the most variable, but, to date, the variants have not been found to occur in sufficient numbers to form a group that could be constituted a variety. *L. marlothii* Knobl. has, for this reason, been put into synonymy without even varietal rank. In the type gatherings, which were collected at Dumisa, Natal, the leaves are long, up to 8 cm. long and of a thin texture with a light yellowish green colour on the lower surface. No specimen seen compares exactly with this material, of which there are a number of duplicates.

Another variant in Natal has small narrow leaves, about 3–5 cm. long and 1 cm. broad, but it too has not been found to occur repeatedly in the same form. In both these variants some of the leaves grade into the typical shape and size and so, for the present, they are classes as *L. foveolata* subsp. *foveolata*.

The distribution of this typical subspecies extends from the Transvaal through Natal and the Transkei to Port Elizabeth and Uitenhage, but not further westward.

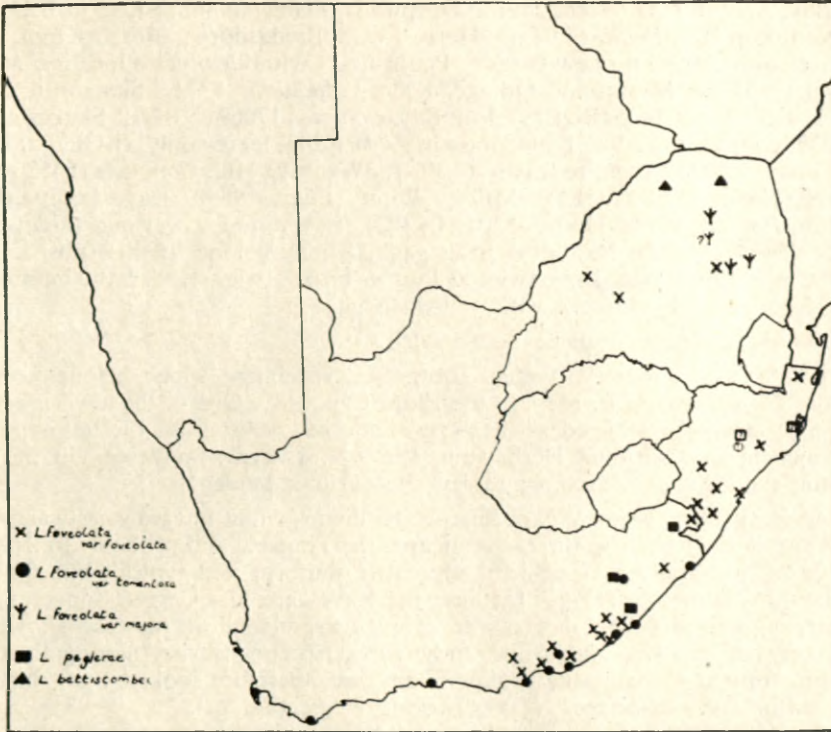


FIG. 12.—Distribution map of *Linociera* species.

(b) subsp. **tomentella** *Verdoorn*, subsp. nov. a typica ramulis ultimis tomentulosis differt. *O. foveolata* Harvey ex Wright in Fl. Cap. 4, 1: 485 (1907) in part; Adamson in Fl. of the Cape Peninsula p. 670 (1950), non E. Mey.

Besides the tomentulose branchlets this subspecies can be recognised by the following features: leaves rather thin, rarely subcoriaceous, broadly elliptic to oblong, mostly less than twice as long as broad, 2–6 cm. long and 1–3 cm. broad shortly narrowed to base and apex, and usually ending in a broad acumen which is retuse at the apex, sometimes sparsely pubescent at the base and on the midrib, at least on leaves on the new growth, lateral veins spreading at a wide angle, petiole very short, 2–5 mm. long; *inflorescence* 0.5–1.5 cm. long with the bracts and calyx often densely setulose, glabrescent; *fruit* oblong-elliptic, green turning black, up to 1.5 cm. long and 0.8 cm. diam.

PLATE 23.

Type: *Burchell* 5539 (PRE), Knysna forest, near the Knysna River ford.

CAPE.—Lusikisiki: near Fraser Falls, *Acocks* 13433 (rather thin small-leaved form). Engcobo: Egossa forest, *Sim* 2472 (rather thin and small leaves). Kentani: *Pegler* 826 (BOL). East London: *Nänni* 137. Albany: Fernkloof, *Story* 4496; 4483. Bathurst: Port Alfred, *Story* 4493 and 4529; Kowie, *Britten* 1879, 2104 (GRA) and 2998 (GRA). Alexandria: Coast Reserve, *Strauch* in F.D. Herb. 3247; Main Forest, *Sim* in F.D. Herb. 3165. Port Elizabeth: *Sister Antony* 29 (GRA); Krakakama, *Burchell* 4515. Knysna, *Burchell* 5539 (type, PRE); Gouna Forest, *Keet* 913; Salt River Forest, *Keet* 526; Belvedere, *Duthie* 584 (GRA); Sanjulie, *Phillips* 139 (GRA);

Buffalo Bay, *Keet* in F.D. Herb. 2591; Deepwalls, *Laughton* 461; *Keet* in F.D. Herb. 2393; Kaffirkop Rd., *Phillips* in F.D. Herb. 139a. Bredasdorp: Bosch Kloof, *Pillans* 9448, leaves only, large, no new twigs? Peninsula: without precise locality, *Mund & Maire* s.n.; Table Mountain, Orange Kloof, *Adamson* 877; Slangoolie Gorge, *Marloth* 11925 a & b; 4405 (BOL); Hout Bay, *Compton* 17069 (NBG); Skoorsteenkop, *Acocks* 639, coppice branch; Kirstenbosch, *Zeyher* 243, leaves only, (BOL); Skeleton Gorge, *Compton* 10020, coppice leaves, (NBG); Wynberg Hill, *Compton* 15452 (NBG); Oudekraal, *Kolbe* 2519 (BOL); Millers Poort, *Pillans* 9890, leaves only, (BOL); Llandudno, *Isaac* in Bolus Herb. 25301 (L, BOL); Witsand, *Lotsy and Goddyn* 1867. [Gerstner 4591, from the Nkandhla forest, Natal, may belong to these subspecies. It is a variant with thin leaves, some twice as long as broad, twigs slender, the inflorescence very short and densely setulose with yellowish hairs.]

Not known to occur outside South Africa.

As pointed out under the typical subspecies, specimens which belong here were cited under *Olea foveolata* E. Mey. in the Flora Capensis. One of the cited specimens, *Burchell* 5539 has been selected as the type of the new subspecies, the holotype being the specimen in the National Herbarium, Pretoria. Isotypes were seen in the Bolus Herbarium, the Albany Museum and Ryksherbarium, Leiden.

L. foveolata subsp. *tomentella* occurs on the Peninsula, at intervals eastwards along the coast and in the forests in the eastern Cape, the Transkei and probably in Zululand. In the coastal localities the specimens are fairly uniform and typical, but the forest specimens show some variation. In these the leaves are in a degree thinner and the inflorescences inclined to be shorter and more densely setulose pubescent. In other respects, such as leaf size and shape, these forest specimens vary among themselves and do not form a recognisable group. They are, therefore looked upon merely as variants within the subspecies. (For distribution see Fig. 12).

(c) subsp. **major** *Verdoorn* subsp. nov. a *L. foveolata* typica fructis majoribus usque 2·8 cm. longis 2 cm. latis, arbore majore, usque 30 m. alto, differt.

This subspecies is distinguished principally on the large fruits which are about the size of a small walnut. Before maturity these drupes have a rather characteristic shape being more or less ovate in outline, sub-quadrate and with a ridge over the obtuse apex, rather like a duck's bill (see Fig. 13). When mature they are more or less oblong, almost 3 cm. long and 2 cm. in diameter. The flesh is rather thin and the mesocarp hard with quite a large seed cavity. Other distinguishing characters are the glabrous branchlets, the larger leaves, up to 7 cm. long and 3·7 cm. broad, and the habit being a tall forest tree.

PLATE 24.

Type: *Urry* in National Herbarium, Pretoria, 28568, Marieps Kop, Pilgrims Rest, Transvaal.

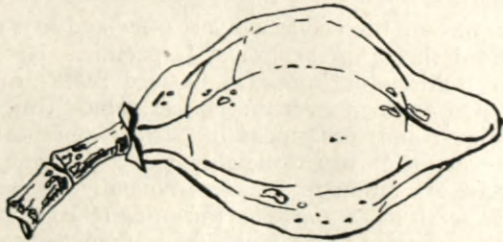
TRANSVAAL.—Letaba: Woodbush, *Botha* in F.D. Herb. 3986. Lydenburg: Magalieskop, *Kotze* in F.D. Herb. 2823 and 2829 (leaves only). Pilgrimsrest: Mariepskop Forest, *Loock* s.n. (3 sheets); *Urry* in National Herbarium 28568, type, 2 sheets. *Keet* in F.D. Herb. 5938; *Loock* in F.D. Herb. 9387 and 9538; *Scheffler* in F.D. Herb. 9929; 10048; 10049; [O'Connor in F.D. Herb. 2014, Woodbush (no fruit, leaf rather long and narrow) and Renny DE3 (no mature fruit, leaves broad) cannot be determined subspecifically but may belong here.]

Not known to occur outside South Africa.

To date this subspecies has been found only in high altitude forests in the eastern Transvaal (Fig. 12). Without seeing the fruit some leafy specimens could be mistaken for the typical subspecies for although, in general, the leaves are broader yet some of the broad leaved variants in one may grade into the narrow leaved form of the other.

In the large fruits *L. foveolata* subsp. *major* resembles *L. peglerae* and *L. battiscombei*, differing from the former in the smaller leaves, up to 7 cm. long as against 13 cm. long in *L. peglerae*, and from the latter in the inflorescence being branched; not glomerate.

The following are some of the notes from forest officers on this tree: "Large angular drupes, not mature; common at higher altitudes and one of the more important species (commercially), but trees short and crooked in bole and contour, little merchantable timber." The following note is in part rather contradictory, "a large tree 80-90 feet high with a single large erect cylindrical bole 40-50 feet to first branch, DBH 24 in., bark grey, fissured, $\frac{1}{2}$ in. to 1 in. thick, heavy crown about 30-40 feet across. The fruits are eaten by birds, monkeys and bushpigs."



AdA.

FIG. 13.—Fruit of *Linociera foveolata* (E. Mey.) Knob. subsp. *major* Verdoorn X 2.

2. *L. peglerae* (C.H. Wr.) Gilg & Schellenb. in Bot. Jb. 51: 71 (1914). *Olea peglerae* (in error *O. pegleri*) C.H. Wr. in Fl. Cap. 4, 1: 485 (1907).

Tree in tall forest, about 60 feet high, new growth glabrous. *Leaves* large, the majority 8-13 cm. long and 3-6.5 cm. broad (coppice leaves 19 by 8 cm., petiole short, base cuneate, not subcordate as in coppice shoots of *L. foveolata*), oblong, oblong-elliptic or obovate-oblong, often widest in upper half, usually long cuneate at base, shortly narrowing towards apex and abruptly narrowed into a broad obtuse acumen at the apex, acumen up to about 1 cm. long, midrib prominent beneath, lateral veins obvious, spreading at about 45°, usually with acarodomatia in the axils; petiole 1 cm. or more long, glabrous. *Inflorescence* of cymose panicles up to about 5 cm long glabrous, branches long and pedicels short; bracts sparsely pubescent glabrescent, sometimes ciliate. *Calyx* lobed to middle or beyond, lobes rounded at the apex, minutely ciliate. *Corolla* cream, lobes more or less 4 mm. long, united in pairs, slit to the base between pairs, margins infolded and apex cucullate (mocassin-like). *Stamens* inserted on joined portion between united pairs, anthers basifixed, 1.75 mm. long. *Ovary* subglobose, somewhat 4-lobed; style short, stigma terminal, sub-capitate, more or less 2-lobed; ovules attached along ventral side. *Fruit* 1.7-2.5 cm. long, 1.2-1.4 cm. broad, before mature somewhat ovate and quadrate in upper half with ridges across the top (duck's bill), sometimes faint. (Quite mature fruit not seen).

PLATE 25

Type: *Pegler* 819, Kentani.

CAPE.—Mount Curry: Fort Donald, *Forester* in F.D. Herb. 9437. Engcobo: Gora Forest, Mannina, *Laughton* in F.D. Herb. 9162 (leaves only); *Zahn* in F.D. Herb. 2045. Kentani: near Kentani, *Pegler* 819 (type number); Manubie, *Forest Officer* in F.D. Herb. 7965? Cult. Kirstenbosch, new area s.n. (NBG).

[N.B.—A specimen, Jackson in Natal Herb. 37523, from St. Lucia Bay, looks as if it might be this species; the leaves are poor (galled), up to 10 cm. long and 2·8–3·5 cm. broad, acumen pronounced on one, 3 fruits, 2 by 1·5 cm., oblong, only very slightly narrowed at top, ridge not obvious; also a leafy specimen collected by Bayer in Qudeni Forest may be this species.]

Not known to occur outside South Africa.

L. peglerae has the more typical leaf characters of the common tropical African species of *Linociera* being rather large, long cuneate at the base with a fairly long petiole and the lateral veins clearly raised on the under surface. In fruit characters it is like *L. foveolata* subsp. *majora* and *L. battiscombei* (= *Dekindtia africana*) with drupes developing to a large size even before they become mature and fleshy and, in the early stages, having a blunt ridge across the apex (like a duck's bill).

To date this species has not been collected very often and so is not at all well known. The following notes from sheets in the Forest Department Herbarium are therefore useful: "It is known at Manubie Forest as Bastard Black Iron Wood and by the Natives as Umdlebe. [On another sheet the Native name 'Umqumaswele' is given]. This tree flowers in August and seed ripens in November or early in December. It grows fairly straight, to about 50 feet in height, with a diameter from 9–18 in. It is rarely purchased by Sawyers although I have frequently known them to work the wood up and attempt to sell it as *O. laurifolia* [meaning *O. capensis* subsp. *macrocarpa*] to wagon builders. It is reported to be much softer than [subsp. *macrocarpa*] and is subject to heart crack. It is fairly plentiful at Manubi Forest and generally throughout mountain forests of Transkei". Miss Pegler writes of it "Large forest tree; glossy leaf, insignificant cream flowers." She does not mention a scent whereas several collectors of *L. foveolata* subsp. *foveolata* mention that the flowers of that subspecies are sweetly scented.

When first published in the Flora Capensis the epithet was incorrectly given as "pegleri" whereas it should be "peglerae" since the collector is cited as "Miss Pegler".

3. *L. battiscombei* Hutch, in Kew Bull. 1914: 17. *Dekindtia africana* Gilg in Bot. Jb. 32: 139 (1902) non *Linociera africana* Knobl. (1834) nec (Welw.) Gilg & Schellenb. (1913).

Tree, mostly 12–15 feet tall with spreading canopy (in tropical african specimens up to 30 feet tall); ultimate branchlets (new growth) appressedly pubescent or puberulous, glabrescent. *Leaves* narrowly to broadly elliptic or oblanceolate to obovate-elliptic, 5–7·5 cm. long and 2–3·5 cm. broad (in tropical african material seen from 5–12 cm. long and 2–4·5 cm. broad), long or shortly cuneate at the base, acuminate, sometimes shortly so, often suddenly narrowed near the apex into a blunt acumen, lateral veins obvious on both surfaces, spreading at a fairly wide angle, usually over 45°, often with acarodomatia in the axils of the veins; petiole 3–9 mm. long. *Inflorescence* a reduced cyme, flowers appearing glomerate in the axil of the leaves, few to many in clusters; bracts and calyx densely adpressedly setulose pubescent without. *Calyx* deeply 4-lobed, the lobes up to 5 mm. long and opposite pairs slightly unequal in size. *Corolla* united at the base into a very short tube, lobes with margins infolded, apex cucullate (slipper toe). *Stamens* inserted on tube, filaments very short; anthers basifixed. *Ovary* slightly narrowed into a very short style; stigma terminal, 2-lobed; ovules attached along ventral face. *Fruit* blackish purple when ripe, about 1·8 cm. long and 1 cm. diam.; cotyledons thick, no albumen.

PLATE 26.

Type: *Battiscombe* 517, Nairobi forests, Kenya. Type of synonym: *Dekindtia africana* Gilg, *Dekindt* 73, Chella Mountains, Angola.

TRANVAAL.—Zoutpansberg: Tshakoma, Obermeyer 1080? (leafy specimen only). Pietersburg: Blaauwberg, Codd 8737; 8737a; Codd & Dyer 9118.

Also occurs in S. Rhodesia and northwards to Kenya and Angola.

When describing *Dekindtia* the author, Gilg, contrasted his new genus with *Olea* and did not mention its relationship to *Linociera*. The principal distinguishing characters mentioned are "the compact axillary inflorescences in the form of sessile nodules . . ., the shape of the corolla with its short tube and strongly elongated lobes with their turned-in margins and apices." In these corolla characters it fits in with the group of specimens here put under *Linociera* and therefore in this genus the apparently glomerate flowers would be the only distinguishing character. But there is a species, *L. congesta* Baker, from the Cameroons which is described as having flowers "in sessile or nearly sessile clusters in the axils of the leaves," also among the specimens under *L. foveolata* subsp. *tomentella* one from Zululand has a very much reduced cyme. Therefore even this character breaks down and the genus cannot be maintained as distinct from the section of *Linociera* here defined. The epithet "africana" has already been combined with *Linociera* [see *L. africana* Knobl. Bot. Centralbl. 61: 129, 1894, and *L. africana* (Welw.) Gilg & Schellenb. Bot. Jahrb. 51: 61, 1913], for species distinct from this one. The next specific epithet for a specimen which is obviously the same species, is *Linociera battiscombei* Hutch. and this is cited by Turrill as a synonym under *Dekindtia africana* in the *Oleaceae*, Flora of Tropical East Africa. It is unfortunate that there is no way of indicating when writing the name and the author that the species was previously described under another name.

From collectors notes it appears that this species grows at high altitudes along mountain streams. The Transvaal specimens were collected on the Soutpansberg and the Blaauwberg, the latter an isolated mountain up to 6,700 feet high, rising from the flats to the west of the Soutpansberg (see Fig. 12). The collector's notes state that the trees on the Blaauwberg were growing on a wooded stream bank at about 4,500 feet. The other record of this species in South Africa, is only a leafy specimen from Tshakoma in the Soutpansberg.

Among the South African species, *L. battiscombei* is in some respects near *L. foveolata* subsp. *tomentella*. Where the last mentioned has the new growth tomentulous, it is puberulous in the former. Both have rather broad leaves and, in some specimens in the subspecies the inflorescence is much reduced and the bracts and calyx lobes quite densely setulose; in these last mentioned instances the much smaller flowers, especially the calyx lobes, which are usually under 2 cm. long distinguish subsp. *tomentella* from *L. battiscombei*, which has calyx lobes up to 5 mm. long.

5. MENODORA.

Humb. & Bonpl. Pl. Aequin. 2: 98, t. 110 (1809); Harv. ex Wright in Fl. Cap. 4, 1: 483 (1907); Steyermark in Ann. Missouri Bot. Gard. Vol. 19: 87 (1932); Phill. Gen. S.A. Fl. Plants ed. 2: 572 (1951). *Bolivaria* Cham. & Schltr. in Linnaea 1: 207 (1826). *Calyptrispermum* A. Dietr. in Linn. Sp. Pl. ed. 6, 1: 226 (1831).

Perennial, suffruticose or sub-herbaceous from a woody base, erect or diffuse with a strong tap-root. *Leaves* simple or divided opposite, sub-opposite or alternate. *Inflorescence* cymose, paniculate or sometimes reduced to a single flower and then with monochasial development. *Calyx* persistent, united at the base with 5 to 10 lobes, lobes sometimes cleft. *Corolla* united, tube usually half the length of the lobes, usually pilose within at the insertion of stamens, lobes usually 5, imbricate. *Stamens* 2, filaments inserted on the tube and decurrent to its base, free above and exerted; anthers attached

near the base, erect, oblong, dehiscent by longitudinal slits. *Ovary* 2-lobed, 2-celled, ovules 2-4 in each cell, collateral, attached to the wall of partition about midway. *Fruit* a bi-ocular capsule, usually both cocci developing, circumscissilely dehiscent. *Seeds* ex-endospermous, 1 to 4 in a coccus, reticulated.

Type species: *M. helianthemoides* Humb. & Bonpl. from Mexico.

The distribution of the genus *Menodora* is very interesting and can be used as evidence of the surmised land-bridge, Gondwana, that is thought at one time to have connected South America with South Africa. The three areas of distribution can be seen on Steyermark's map reproduced here (see Fig. 14) from his revision of the genus in the Annals of the Missouri Bot. Garden, Vol. 19, 1932. They are (1) S.W. United States and Mexico, (2) Central and southern S. America and (3) South Africa. The area marked in South Africa is not quite correct and must be extended to Namaqualand in the western Cape, and the Little and Great Karoo in the South (see notes under the species *M. juncea* and fig. 15).

At first sight it may seem hard to believe that this genus belongs to the family *Oleaceae* and indeed the history of its classification makes interesting reading (see Steyermark's Revision l.c.) but a critical examination will show that there can be no doubt at all about its close relationship to *Jasminum*, and that its correct place is therefore in the same family. It is interesting to know that the authors of the genus originally, but only tentatively, referred the genus to "*Jasmineae*" which is now *Oleaceae*. In the next three decades it was placed in turn in *Acanthaceae*, *Gentianaceae* and a separate family *Bolivariaceae* described to take *Menodora* and its synonym *Bolivaria* (*Bolivaria* was considered distinct at the time).

In the family *Oleaceae* the genus *Menodora* is distinguished by its fruit which is a bi-ocular capsule, both cocci usually developing. Except for one species in the United States the dehiscence is by a horizontal suture, the top of the capsule coming off like a cap and exposing the seeds.

Key to Species.

- | | |
|---|--|
| Rigid suffrutex; leaves simple, usually much reduced; pedicel erect in fruit. | 1. <i>M. juncea</i> . |
| Diffuse sub-herbaceous plants from a woody base; leaves mostly lobed or pinnatisect; pedicel cernuous in fruit: | |
| Leaves mostly bi-pinnatisect, segments subulate; calyx-lobes multipartite. | 2. <i>M. africana</i> . |
| Leaves mostly 3 to 5-lobed, segments 1.5-2.5 mm. broad; calyx-lobes usually undivided. | 3. <i>M. heterophylla</i>
var. <i>australis</i> . |

1. *M. juncea* Harv. Gen. Pl. ed. 2: 220 (1869);* Harvey ex Wright in Fl. Cap. 4, 1: 484 (1907); Steyermark in Ann. Missouri Bot. Gard. 19: 150.

Suffrutex, virgate, 1-5 feet tall, branches rigid, suberect, terete, striate, minutely silvery puberulous. *Leaves* sessile, remote, linear, cuneate at the base, often much reduced, close pressed, 0.3-3 cm. long and up to 3 mm. broad. *Inflorescence* of one or several terminal, 3-flowered cymes. *Calyx* 5-6-lobed, tube usually 2.5-3 mm. long, lobes linear to linear-acuminate from a triangular base, 2.5-8 mm. long. *Corolla* yellow; tube about 6 mm. long; lobes oblong to oblong-obovate, 1.2-2 cm. long and 7-1.4 cm. broad, broadly rounded at apex, mucronate. *Stamens* exerted; anthers 4-6 mm. long. *Ovary* deeply 2-lobed; style filiform up to 1.4 cm. long; stigma small, capitate. *Fruit* a 2-lobed capsule, sometimes only one lobe developing, sub-globose up to 9 mm. long and 8 mm. broad, the coat becoming chartaceous and dehiscent circumscissilely. *Seeds* black (seen through capsule wall on one of the borrowed specimens).

PLATE 27.

* Since this edition was published posthumously and edited by J. D. Hooker it has been suggested that "Hook. f." is the correct authority but see introduction.

Type: *Whitehead* s.n., Modderfontein, near Springbok, Namaqualand.

CAPE.—Namaqualand: Richtersveld, Kubus, *Marloth* 12282b; west of Anenous Mt., *Taylor* 1132 (BOL); Kamieskroon, *Acocks* 14996; *Pearson* 5639 (BOL); Soebatsfontein Road, *Thorns* s.n. (NBS); Numees Mine, *Pillans* 5108 (BOL); Stinkfontein, *Mathews* in Herb. Bol. 25412. Laingsburg: Near Grootfontein, *Marloth* 8347. Prince Albert: near Prince Albert Road, *Marloth* 4519 (BOL); Beaufort West: near Rosesberg Pass, *Acocks* 15885. Without locality, *Scully* in S.A. Mus. Herb. 41539 (SAM).

Endemic in the western and south western Cape.

The distribution of this species is in the karroid areas of Namaqualand, in the western Cape, and the Great and Little Karoo in south central Cape. It does not occur very generally in these regions, but is found in restricted localities within them. At such localities the individuals occur in fair numbers.

As pointed out in the notes under the genus the distribution in South Africa shown by Steyermark in his map (see Fig. 14) has to be extended. Steyermark had only one gathering, a Zeyher specimen, of *Menodora juncea*. The locality for Zeyher's specimen (see *Linnaea* 19: 590 No. 94) is rather vague for it reads "Georg, Karoo in the clearing of the Gouritz River, 1,000 ft. (IV, B, b, 14)". Today the district of George is not near the Gouritz, but in the maps of Zeyher's day it is shown to extend westwards to that river. Today the Mossel Bay and Riversdale districts lie one on each side of the Gouritz river. From Drege's map "IV, B, b" is a strip inland from the coastal strip and this places the locality somewhere about the northern boundaries of the districts mentioned that is near Herbertsdale which is similar veld to that in which the species occurs elsewhere. So Steyermark's locality which is shown by a circular spot near the coast in the south (see Fig. 14) should be moved slightly to the west and extended to the Great Karoo and the Namaqualand Karroid veld to complete the distribution of the genus as it is known today (see Fig. 15).



FIG. 14.—General distribution of the genus *Menodora* taken from Steyermark's revision in the *Annals of the Missouri Botanic Gardens* Vol. 19 (1932).

Menodora juncea is very distinct from the other two South African species and has its allies in the Americas. It is a stiff erect suffrutex with remote leaves, most of them much reduced. The flowers are in compound cymes with the pedicels erect in fruit instead of, as in the other two species, 1-flowered inflorescences with monochasial development which results in the pedicels being cernuous in fruit (compare plates 27 and 28).

2. *M. africana* Hook. Ic. Pl. t. 586 (1843); Wood & Evans in Natal Plants 3: 17, Pl. 240 (1902); Harv. ex Wright in Fl. Cap. 4, 1: 484 (1907); Steyermark in Ann. Missouri Bot. Gard. 19, 1: 123 (1932); Fl. Pl. of Africa 30, pl. 1187 (1955).

Undershrub with many slender branches from a woody base; branches sub-herbaceous, slender, about 5–25 cm. tall, ridged, the ridges formed by decurrent bases of the petioles, sparsely scabrid. *Leaves* alternate, sub-opposite or opposite towards the base, sub-sessile to petioled, up to 1.5 cm. long, bi-pinnatisect with occasional simple or simply pinnate leaves, segments narrow, more or less subulate with inrolled scabrid margins. *Inflorescence* a reduced cyme with monochasial development; flowers solitary, terminal, appearing lateral when the main branch turns aside and a secondary one develops as the main axis and overtops the flower. *Calyx* sparsely or densely scabrid without; tube 2–3 mm. long; lobes longer than the tube, multipartite, segments more or less subulate. *Buds* red. *Corolla* yellow, tinged reddish; tube about 4 mm. long, narrow below widening at the mouth, sparsely pilose in the throat; lobes oblong about 1 cm. long and 4.5 mm. broad, rounded at the apex, mucronate, slightly narrowing towards the base. *Stamens* 2, filaments inserted in the corolla-tube, free for 3–4 mm. pilose where affixed to tube; anthers 3–4 mm. long, 1.5 mm. broad, sub-basifixed, erect, sometimes minutely mucronate. *Ovary* 2-celled, bi-lobed, ovules 4 in each cell, axillary; style about 9 mm. long; stigma small, capitate, terminal. *Fruit* a bi-locular capsule sometimes only one locule or coccus developing, borne on a cernuous pedicel, coat parchment like, dehiscing circumscissilely when ripe; seeds usually 2 or 3 in each coccus, about 1 cm. long, more or less oblong, outer coat reticulated.

PLATE 28.

Type: *Burke* 134 ("1341" in error in Hooker's Icones), Vet River, Orange Free State.

BECHUANALAND PROTECTORATE.—Kanye: Pharing, *Hillary & Robertson* 480.

TRANSVAAL.—Pietersburg: near Pietersburg, *v. d. Merwe* 2272; *Meeuse* 9153. Waterberg: near Palala, *Smuts & Gillett* 3371; Warmbaths, *Sidey* 1308; Leeuwpoot, *Rogers* 22393 (J). Pretoria: *Moss* 10142; 6 m. S. of Pretoria, *Verdoorn* in National Herbarium 28544; *Comins* 860; 3 m. S. of Pretoria, *Codd* 1740; near Irene, *Smith* 1099; Swingbridge area, *Repton* 3332; Arcadia, Stent in herb. 9563; Wonderboom Reserve, *Repton* 2765; Brooklyn, *Mogg* 15217; Derdepoort, *Leendertz* 369 (L, GRA); Hatherly, *Rogers* 109 (GRA); Magaliesberg, *Zeyher* 1132 (BOL); near Pretoria, *Bolus* 25415 (BOL); *McLea* in Herb. Bol. 25414 (not "3104" as cited in Fl. Cap.?) (BOL); Rooi Kop, *Smuts & Gillett* 2543; *Pole-Evans* 1249; Rust-der-Winter, *Gerstner* 5527. Lydenburg: *Wilms* 1068 (L). Barberton: Queen's River, *Galpin* 1071b; near Corocodile Poort, *Galpin* 1071 (GRA). Standerton: near Val Station, *Smuts* 397. Heidelberg: Lagerspoort, *Prosser* 1650. Germiston: Palmietfontein, *Gilliland* 26812. Modderfontein: *Haagner* s.n. (GRA). Johannesburg: Thorntree Kloof, *Moss* 6605 (Wits.). Vereeniging: *Gilfillan* 148. Potchefstroom: West of Potchefstroom, *Story* 760; Panfontein Reserve, *Louw* 1977; Boskop, *Louw* 355; Welverdiend, *Louw* 72; School of Agriculture, *Liebenberg* 934; 953; 985. Wolmaransstad: *Liebenberg* 3022. Christiana: Commonage, *Burt Davy* 12480; Kameelpan, *Theron* 439.

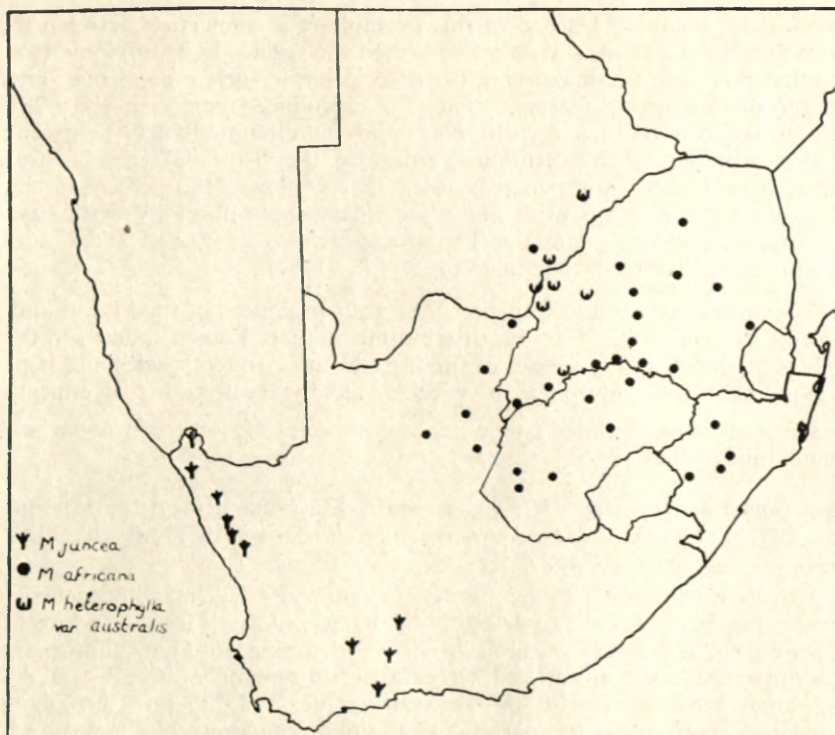


FIG. 15.—Distribution of 3 species of *Menodora* in Southern Africa.

CAPE.—Mafeking: Moshesh, *Brueckner* 420; *Appleyard* in SAM. Herb. 18090 (SAM); Pitsani Road, *Bolus* 6433. Vryburg: Armoedsvlakte, *Mogg* 8024. Between Kuruman and Vaal, *Cruickshank* in Herb. Bol. 2537; Between Kuruman and Vryburg, *Thorne* in SAM. Herb. 54476 (SAM). Griquatown: Postmasburg, *Wilman* 9116. Barkly West: *Marloth* 958; Hebron, *Flanagan* 1472. Kimberley: *Elliott* s.n.; *Moran* s.n.; *Moran* 86 (GRA); *Hafstroom* H 902; *Oliver* s.n. (SAM); du Toit's Pan, *Tuck* in SAM. Herb. 18089 (SAM); *Bolus* 25413 (BOL); Mostert's Hoek, *Acocks* and *Hafstroom* H992.

ORANGE FREE STATE.—Without precise locality: Vet River, *Burke* 134, Isotype (BOL); Draaifontein, *Rehmann* 3620 (BOL). Parys: *Moss* 13499 (J). Heilbron: *Goossens* 410. Kroonstad, *Pont* 228; *Schweickerdt* 1094. Senekal: Doornkop, *Goossens* 782. Bloemfontein: Glen, *Pole-Evans* 19627. Faturesmith: Heuningberg, *Marais* 172; Klipnek, *Marais* 140; Petrusburg, *Henrici* 4292.

NATAL.—Without precise locality: Tugela River, *Medley Wood* 3550; Muden Valley, *Repton* 1187; Dundee: Indumeni Mtn., *Truscott* 157; near Dundee, *Pegler* s.n. Klip River: Ladysmith, *Medley Wood* 7948 (L). Estcourt: Research Station, *West* 528; 420; *Pentz* 483; *Colenso*, *Schlechter* 3369 (GRA); *Colenso*, Tugela River, *Medley Wood* s.n. (GRA); bank of Tugela, *Medley Wood* 758 (SAM).

Not known to occur outside Southern Africa.

Burke on his expedition to the Transvaal with *Zeyher*, collected this species along the Vet River in the Orange Free State and on the Magaliesberg near Pretoria. When working on *Burke*'s plants *Hooker* recognised this as a "congener with *Menodora* . . . hitherto supposed to be exclusively an inhabitant of the New World". For the first

time then in 1843, botanists learned of this example of a connection between the flora of S. Africa and the Americas. Hooker described the species as *M. africana* (see Hook. Ic. t. 586) and the plate accompanying his description is such a good one, giving the details of the distinguishing features, that it is reproduced here (see plate 28). The bi-pinnatisect leaf can be seen on this plate and the circumscissile dehiscent fruit. There is one example of the cernuous pedicel to the fruit and this illustrates the monochasial development, for it can be seen that in flower the pedicel is erect and terminal and that it then turns aside and a secondary shoot develops as the main axis, the fruit therefore appearing lateral. The species is also illustrated and described in detail in Flowering Plants of Africa (Vol. 30, Pl. 1187).

M. africana has been found to occur in all four provinces of the Union and in the Bechuanaland Protectorate. For the distribution as it is known today see the map, Fig. 15. It is the most widely spread of the three South African species and is plentiful in the regions of its distribution as may be judged by the long list of citations.

This species is closely related to the following species *M. heterophylla* var. *australis*, see the notes under that species.

3. *M. heterophylla* Moric ex DC. var *australis* Steyermark in Ann. Missouri Bot. Gard. 19: 127 (1932). *Menodora heterophylla* Oliver in Hook. Ic. Pl. t. 1459 (1884); Wright in Fl. Cap. 4, 1: 484 (1907).

Undershrub with several to many slender, more or less erect branches from a woody base; branches about 7 to 25 cm. tall, slender, more or less angled and ridged, sparsely scabrid. *Leaves* very variable in size and lobing, alternate, approximate or sometimes opposite, sessile or petioled, irregularly and pinnately 3 to 5-lobed or simple, 4–18 mm. long, 3–6 mm. broad, the segments acute, 1·5–2·5 mm. broad, margins scabrid, inrolled, surface fairly sparsely glandpitted. *Inflorescence* a reduced cyme, monochasial, flowers terminal appearing lateral when overtopped by a secondary branch which takes the place of the main axis. *Calyx* persistent but not accrescent, 5–10 mm. long; tube about 2 mm. long; lobes 10–15, narrowly linear, entire or occasionally lobed, unequal in length and up to 1 mm. broad, acute, scabrid on the margins. *Corolla* yellow (sometimes with red infusion in parts?); tube about 3 mm. long, infundibuliform; lobes about 1 cm. long and 4·5 mm. broad, oblong, slightly narrowed at apex, or rounded with a mucro. *Filaments* inserted on the tubular portion of the corolla tube and pilose there, free for about 3 mm. *Anthers* about 3 mm. long, 1·5 mm. broad, sub-basifixed, erect, minutely apiculate. *Ovary* 2-lobed, style about 6–8 mm. long (appears to be red sometimes), stigma terminal, broadly capitate, obscurely bi-lobed. *Fruit* on a cernuous pedicel, a bi-ocular capsule, occasionally only 1 coccus develops, dehiscing circumscissilely when ripe, coat parchment-like; seeds 1–4 in each coccus, 6–9 mm. long, 4–6 mm. broad, outer skin reticulated.

Type: Pegler 950 (BER), from near Rustenburg. [Type of the species, Berlandier 1499, between Laredo & Bejar, Mexico].

BECHUANALAND PROTECTORATE.—Lobatsi: Rogers 6225; 6 m. N.E. of Gaberones, Codd 8937. Mochudi: Harbor 6529 (BOL); Rogers 6372 (BOL). Mahalapye: Mansergh in Bol. Herb. 25416 (BOL).

TRANSVAAL.—Marico: Zeerust, Thode A. 1442; 4 m. S. of Zeerust, Acocks 12415; Matebe Valley, Holub s.n. Rustenburg: near Rustenburg, Pegler 950 (on several sheets of this number there is a portion of *M. africana*, see notes); near race course, Galpin 9668; Nasion 229 (BOL); Wonderfontein, Gray in Col. Herb. 4131; Zwarttruggens, Sutton 852; 1113. Klerksdorp: Phillips 53; Convent 28 (GRA); Sister Lucy 11 (GRA).

Not known to occur outside above regions.

This variety was first collected by Dr. Em. Holub in the "Matebe Valley", Marico, Transvaal. From information obtained recently at the Mission Station at Linokana, the "Matabe" is the stream passing through that village which is a few miles to the west of Zeerust. When the well known Kew Botanist N. E. Brown came upon the specimens in the collection presented to Kew by Dr. Holub in 1883 he identified them with the New World species *Menodora heterophylla*. A note in N. E. Brown's own handwriting on a Holub duplicate in the Bolus Herbarium reads in part "A most interesting discovery as the plant has hitherto only been found in Texas. I have minutely examined these Transvaal and the Texan specimens and can find no difference at all between them." Steyermark in his Revision, 1932, agrees that the S. African specimens are not specifically distinct, but owing to certain "morphological differences" he describes them as a variety of the New World species. The main difference is in the size of the leaves, which in the Texan plants are up to 4 cm. long and 3 cm. broad while in our plant they are seldom even half that size. Working with the African plants only it is not possible to form an independent opinion on this point, therefore the recent revisor of the genus is followed. In South Africa this variety is very close to *M. africana* and differs principally in the leaves being lobed rather than bi-pinnatisect, and the segments not being subulate. The calyx segments are usually simple and only occasionally lobed, instead of being usually multipartite; the habit also is rather more erect and rigid. If the plate from "Hooker's Icones", which depicts Holub's specimen and is reproduced here (see Pl. 29), is compared with that of *M. africana* (see pl. 28), these differences will be very evident but, owing to the variation in size and shape of the leaves of *M. heterophylla* var. *australis*, it is not always quite so easy to distinguish between it and *M. africana*. Miss Pegler, for instance, whose specimen No. 950, is the type of the South African variety, evidently did not see the difference for her notes on the duplicate of the specimen in the National Herbarium, Pretoria, reads: "observed from Pretoria to Woodstock," Rustenburg district. It has also been found that on several herbarium sheets of her gathering 950 (including one in Pretoria and others in the Bolus and Albany herbaria), there is at least one piece of *M. africana* among the, to us, distinct specimens of *M. heterophylla* var. *australis*. To date *M. africana* has not been collected anywhere near Rustenburg but it is plentiful in the neighbourhood of Pretoria. It is therefore not possible at this stage to account for the mixture on Miss Pegler's specimen, but one is inclined to assume that she collected some of the material in the early stages of her trip when she observed the plant "from Pretoria to Woodstock" and the bulk of the material at Woodstock. It could only have been at intervals on the way that she could have seen plants, for neither species has an extended or general distribution but is found in patches under certain veld conditions.

When Oliver described Holub's find in the "Icones" he writes of the second South African species of *Menodora*, but it was really the third for in 1869 the second, Harvey's species *M. juncea*, was published.

Index.

	PAGE
Acanthaceae.....	602
Bolivariaceae.....	602
Bolivaria Cham. & Schltr.....	601
Calypotropium A. Dietr.....	601
Campanolea Gilg & Schellenb.....	592, 594
<i>mildbraedii</i> Gilg & Schellenb.....	594
Ceranthus, section <i>Linociera</i>	592, 593
<i>Dekindtia</i> Gilg.....	592, 601
<i>Dekindtia africana</i> Gilg.....	594, 600, 601, 636
Gentianeae.....	602
Jasmineae.....	602
Jasminum Linn.....	550, 556
<i>abyssinicum</i> (Hochst, ex) DC. [Pl. 6].....	557, 563, 564, 616
<i>angulare</i> Vahl. [Pl. 4].....	556, 557, 559, 560, 561, 563, 566, 614
<i>angulare</i> var. <i>glabratum</i> E. Mey.....	549, 560, 561, 562
<i>breviflorum</i> Harv. [Pl. 7].....	549, 557, 564, 565, 566, 617
<i>capense</i> Thb.....	560, 561
<i>flexile</i> Jacq.....	559
<i>fluminense</i> Vell. [Pl. 5].....	557, 560, 561, 562, 563, 564, 615
<i>gerrardi</i> Harv.....	549, 564, 565, 566, 617
<i>glaucum</i> (L. f.) Ait. [Pl. 8].....	557, 566, 567, 569, 618
<i>glaucum</i> var. <i>lanceolatum</i> E. Mey.....	566
<i>glaucum</i> var. <i>latifolium</i> E. Mey.....	566
<i>glaucum</i> var. <i>parvifolium</i> E. Mey.....	567, 568
<i>goetzianum</i> Gilg.....	562
<i>hirsutum</i> Linn.....	556
<i>humile</i> Linn. Cult.....	557
<i>ligustrifolium</i> Lam.....	566
<i>lupinifolium</i> Gilg. & Schellenb.....	558, 559
<i>mauritanum</i> Boj.....	562, 563
<i>meyeri-johannis</i> Engl.....	569
<i>multiflorum</i> (Burm.) Andr. Cult.....	556
<i>multipartitum</i> Hochst, [Pl. 9].....	556, 557, 567, 569, 570, 619
<i>natalense</i> Gilg. & Schellenb.....	560, 561, 563
<i>officinale</i> Linn.....	556
<i>pauciflorum</i> Bth.....	572
<i>pubescens</i> Willd.....	556
<i>quintum</i> Schinz. [Pl. 1].....	557, 558, 559, 611
<i>schoetarianum</i> Schinz.....	562, 563
<i>stenolobum</i> Rolfe [Pl. 10].....	557, 569, 570, 620
<i>stolzeanum</i> Knobl.....	566
<i>streptopus</i> E. Mey.....	549, 558, 570, 572
<i>streptopus</i> E. Mey. subsp. <i>streptopus</i> [Pl. 11].....	558, 570, 571, 621
<i>streptopus</i> E. Mey. subsp. <i>transvaalsense</i> (Sp. Moore) Verdoorn [Pl. 12].....	558, 570, 572, 622
<i>swynnertonii</i> Sp. Moore.....	572
<i>tortuosum</i> Willd. [Pl. 2, 3].....	557, 558, 559, 560, 612, 613
<i>transvalense</i> Sp. Moore.....	572
<i>wyliei</i> N.E. Br.....	563, 564
Linociera Sw.....	550, 573, 592, 593, 594, 601
<i>africana</i> Knobl.....	600, 601
<i>africana</i> (Welw.) Gilg & Schellenb.....	600
<i>battiscomei</i> Hutch. [Fig. 11, Pl. 26].....	593, 594, 597, 599, 600, 601, 636
<i>congesta</i> Bkr.....	601
<i>foveolata</i> (E. Mey.) Knobl.....	594, 595, 598
<i>foveolata</i> (E. Mey.) Knobl. subsp. <i>foveolata</i> [Pl. 21, 22].....	594, 595, 596, 597, 600, 631, 632
<i>foveolata</i> (E. Mey.) Knobl. subsp. <i>majora</i> Verdoorn [Fig. 13, Pl. 24].....	594, 596, 597, 598, 599, 600, 634
<i>foveolata</i> (E. Mey.) Knobl. subsp. <i>tomentella</i> Verdoorn [Pl. 23].....	590, 597, 598, 601, 633
<i>latipetala</i> M.R.F. Taylor.....	594
<i>ligustrina</i> Sw.....	593
<i>marlothii</i> Knobl.....	595, 596, 632
<i>mildbraedii</i> Gilg & Schellenb.....	594
<i>peglerae</i> (C.H. Wr.) Gilg & Schellenb [Pl. 25].....	594, 597, 599, 635

	PAGE
Menodora Humb. & Bompl.	550, 601, 603
<i>africana</i> Hook. [Pl. 28].	602, 604, 605, 606, 607, 638
<i>helianthemoides</i> Humb. & Bonpl.	602
<i>heterophylla</i> Mor. ex DC.	607
<i>heterophylla</i> Mor. var. <i>australis</i> Steyermark [Pl. 29].	602, 605, 606, 607, 639
<i>heterophylla</i> Oliver non Moric.	606
<i>juncea</i> Harv. [Pl. 27].	549, 602, 603, 604, 605, 607, 637
<i>Nathusia alata</i> Hochst.	550, 551, 553
<i>Nyctanthus glauca</i> Linn. f.	566
<i>Olea</i> Linn.	550, 572, 573
<i>africana</i> Mill. [Fig. 3, Pl. 13].	573, 574, 576, 577, 578, 579, 580, 623
<i>buxifolia</i> Mill.	582
<i>capensis</i> Linn.	573, 581, 582, 584, 626
<i>capensis</i> Linn. subsp. <i>capensis</i> [Fig. 6, 7, 8. Pl. 16, 17, 18].	573, 581, 582, 584, 585, 586, 587, 592, 626, 627, 628
<i>capensis</i> Linn. subsp. <i>enervis</i> (Harv.) Verdoorn [Fig. 9, Pl. 19].	573, 581, 588, 589, 629
<i>capensis</i> Linn. subsp. <i>macrocarpa</i> (C.H. Wr.) Verdoorn [Fig. 10, Pl. 20].	573, 578, 581, 584, 590, 591, 592, 593, 600, 630
<i>chrysophylla</i> Lam.	573, 574, 576
<i>concolor</i> E. Mey.	582, 584
<i>cuspidata</i> Wall. ex G. Don.	573
<i>enervis</i> Harv.	549, 581, 588, 589
<i>europaea</i> Linn.	573, 574, 576
<i>europaea</i> Thb. non Linn.	573
<i>europaea</i> var. <i>nubica</i> Bkr.	573, 574, 576
<i>exasperata</i> Jacq. [Fig. 5, Pl. 15].	573, 579, 580, 584, 625
<i>ferruginea</i> Royle.	573
<i>foveolata</i> E. Mey.	593, 595, 597, 598
<i>gallica</i> Mill.	576
<i>guineensis</i> Hutch. & C.A. Sm.	581
<i>hochstetteri</i> Bkr.	581
<i>humilis</i> Eckl.	579, 580, 625
<i>laurifolia</i> Harv. ex Wright non Lam.	588, 590
<i>laurifolia</i> J. Phillips non Lam.	590, 592
<i>laurifolia</i> Lam.	581, 582, 584, 588, 590, 592, 600, 627
<i>laurifolia</i> Lam. var. <i>concolor</i> Harv.	582, 584
<i>laurifolia</i> Sim. non Lam.	590
<i>listeriana</i> Sim ex Lister.	577, 578
<i>mackenii</i> Harv.	577, 578
<i>macrocarpa</i> C.H. Wr.	581, 590, 592
<i>mildbraedii</i> (Gilg & Schellenb.) Knobl.	593, 594
<i>monticola</i> Gandoger.	573
<i>peglerae</i> C.H. Wr.	593, 599, 600
<i>schimperii</i> Gandoger.	573
<i>similis</i> Burch.	573, 574
<i>somaliensis</i> Bkr.	573
<i>undulata</i> Jacq.	582
<i>undulata</i> Jacq. var. <i>planifolia</i> E. Mey.	582, 584
<i>urophylla</i> (Gilg) Gilg & Schellenb.	581
<i>verrucosa</i> Link.	573, 574, 576, 578, 623
<i>verrucosa</i> Link. var. <i>brachybotrys</i> DC.	573
<i>welwitschii</i> (Knobl.) Gilg & Schellnb.	581, 593
<i>woodiana</i> Knob. [Fig. 4, Pl. 14].	573, 574, 577, 578, 579, 592, 624
<i>Schrebera</i> Roxb.	550
<i>alata</i> (Hochst.) Welw. [Fig. 1].	551, 552, 553, 556
<i>argyrotricha</i> Gilg. [Fig. 2].	553, 555, 556
<i>gilgiana</i> Lingelsh.	554, 556
<i>greenwayi</i> Turril.	556
<i>latialata</i> Gilg.	551, 552, 553
<i>mazoensis</i> Sp. Moore.	553, 554
<i>merkeri</i> Lingelsh.	553
<i>nyassae</i> Lingelsh.	553
<i>obliquifoliolata</i> Gilg.	553
<i>saundersiae</i> Harv.	551, 552, 553
<i>swietenoides</i> Roxb.	551
<i>tomentella</i> (Welw.) Gilg.	556
<i>trichocalda</i> Welw.	551



PLATE 1.—*Jasminum quinatum* Schinz; specimen from near the type locality in Lydenburg; whole plant, showing rhizome.



PLATE 2.—*Jasminum tortuosum* Willd.; holotype in the Berlin-Darlem Herbarium.



PLATE 3.—*Jasminum tortuosum* Willd.; on right, Drege s.n. in Ryksherbarium, Leiden (may be same gathering as cited by DC. under this species); on left, Muir 2400 from Mossel Bay district (PRE).



PLATE 4.—*Jasminum angulare* Vahl; on right Drege B, b, glabrous; on left, Drege a, tomentulose, specimen in Ryksherbarium, Leiden.



PLATE 5.—*Jasminum fluminense* Vell.; Burtt-Davy 360, Komatipoort (K) cited in Fl. Cap. under *J. angulare* but is not that species; note the very small calyx and broad inflorescence borne clear of the leaves.



PLATE 6.—*Jasminum abyssinicum* Hochst. ex DC.; Wylie in Medley Wood Herb. 8860, isotype, from Nkandhla, Natal.



PLATE 7.—*Jasminum breviflorum* Harv.; on right, Burke s.n. Magaliesberg, type (K) with leaves pubescent, not tapering to base and apex; on left top, two portions of Gerrard 1477, type of *J. gerrardi* (K), Nonoti Riv., Natal, with leaves glabrous tapering to base and apex; lower left hand, Rehman 7706, Natal, cited in *Fl. Cap.* under *J. gerrardi*, with glabrous leaves tapering to apex only.

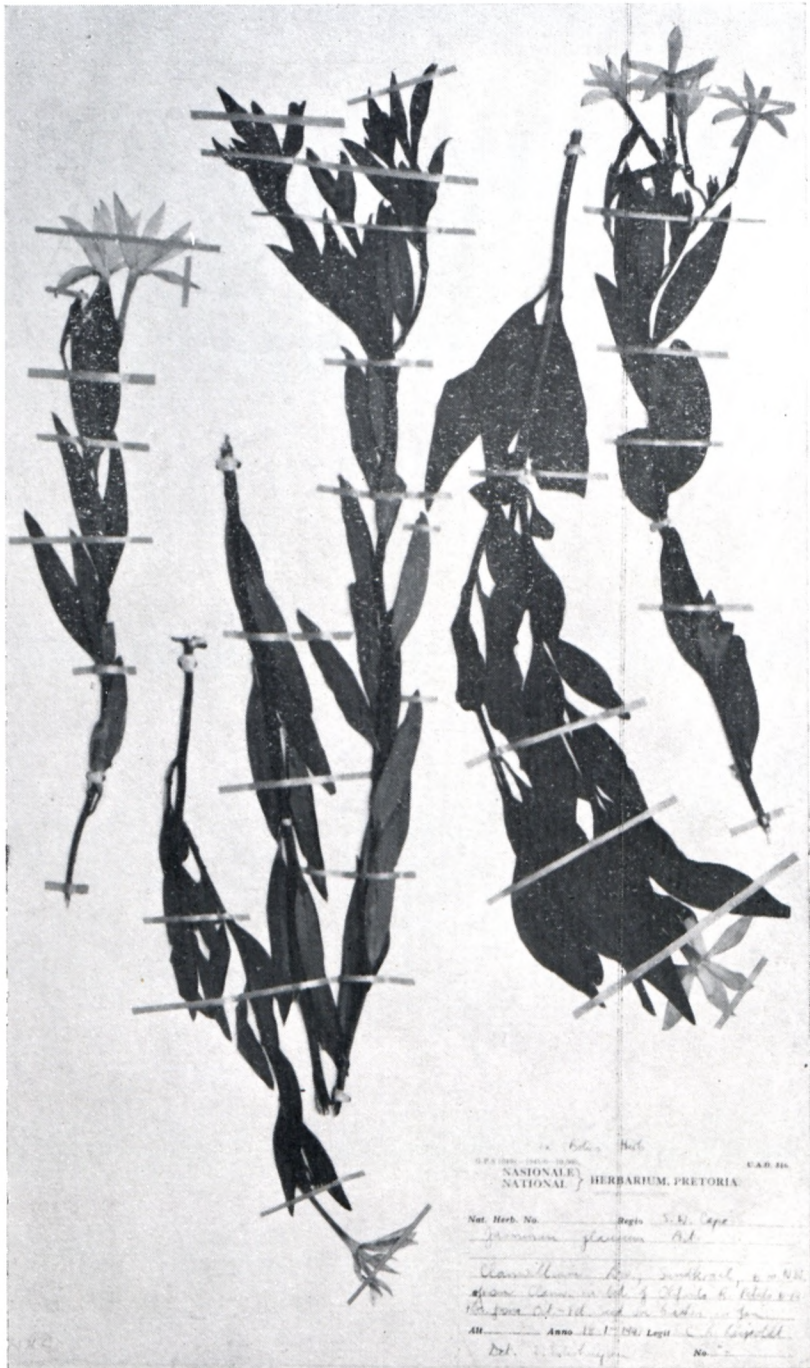


PLATE 8.—*Jasminum glaucum* (L.f.) Ait.; specimen from Clanwilliam characteristic of species.



PLATE 9.—*Jasminum multipartitum* Hochst.; Krause 458, isotype (K), from near Durban; on same sheet Burke s.n. from Uitenhage district.



PLATE 10.—*Jasminum stenlobum* Rolfe; specimen from the Soutpansberg district, Transvaal.



PLATE 11.—*Jasminum streptopus* E. Mey. var *streptopus*; Drege s.n., holotype, Geneva, collected at "Port Natal".

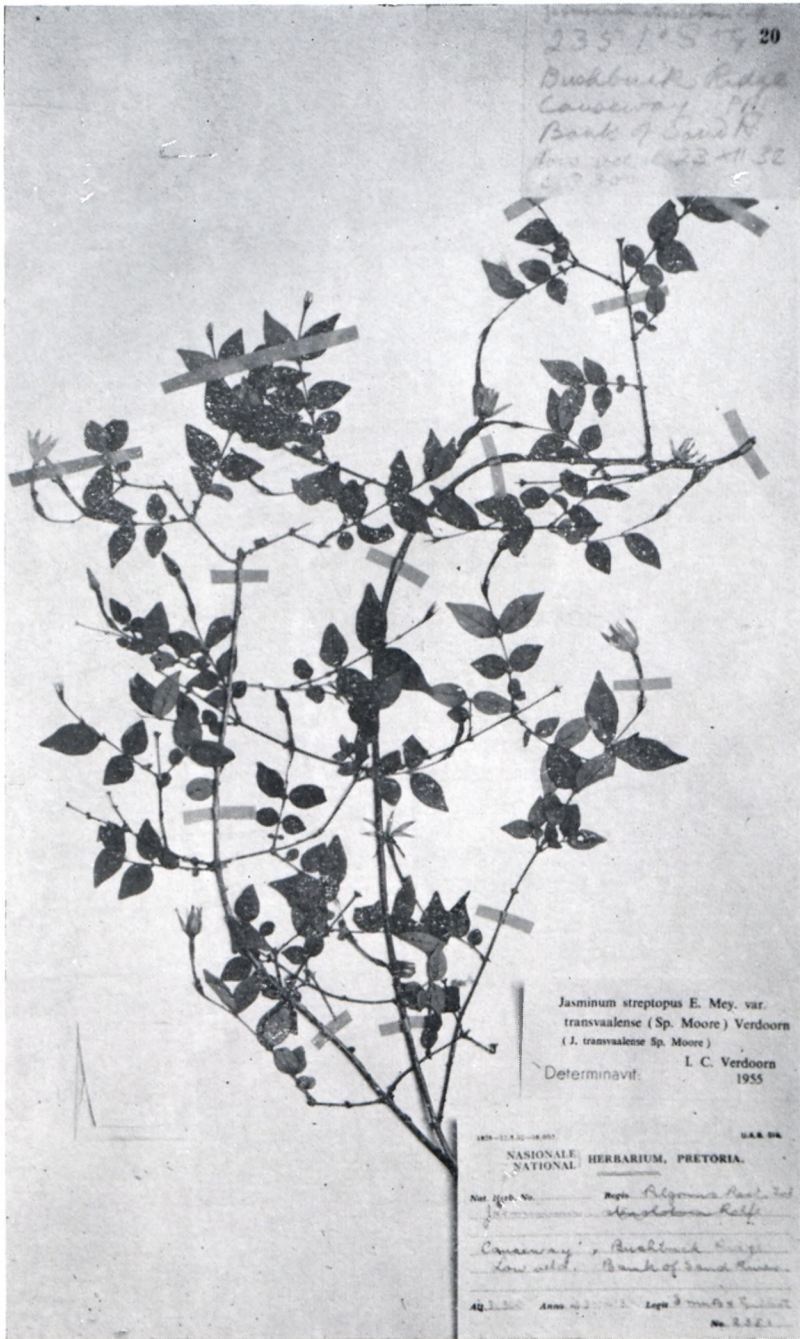


PLATE 12.—*Jasminum streptopus* E. Mey. var. *transvaalense* (Sp. Moore) Verdoorn; a characteristic specimen from the Pilgrimsrest district, Transvaal.



PLATE 13.—*Olea africana* Mill.; after Sim, Forest Flora of C.C., plate 105, under the name *O. verrucosa*.



PLATE 14.—*Olea woodiana* Knobl.; after Sim, Forest Flora of C.C., plate 108.



PLATE 15.—*Olea exasperata* Jacq.; after Sim, Forest Flora of C.C. plate 120, under the name *O. humilis*.

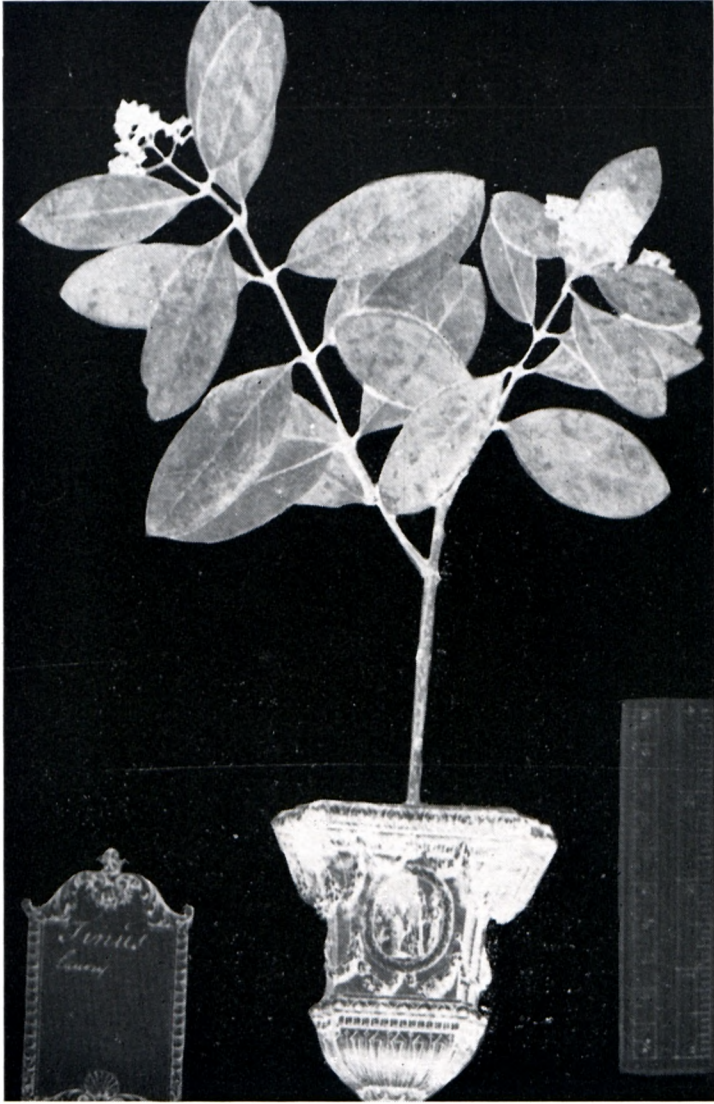


PLATE 16.—*Olea capensis* L. subsp. *capensis*; photo of type specimen of *O. capensis* L in the Linnaen Herbarium.



PLATE 17.—*Olea capensis* L. subsp. *capensis*, photo of type specimen of *O. laurifolia* Lam. in the Paris Museum.



PLATE 18.—*Olea capensis* L. subsp. *capensis*; photo of Drege s.n.; between Nieuwekloof and Elands-kloof, Tulbagh district, isotype of *O. concolor* E. Mey. in Ryksherbarium Leiden.



PLATE 19.—*Olea capensis* L. subsp. *enervis* (Harv.) Verdoorn; two specimens of Gerrard 1151, type (K).

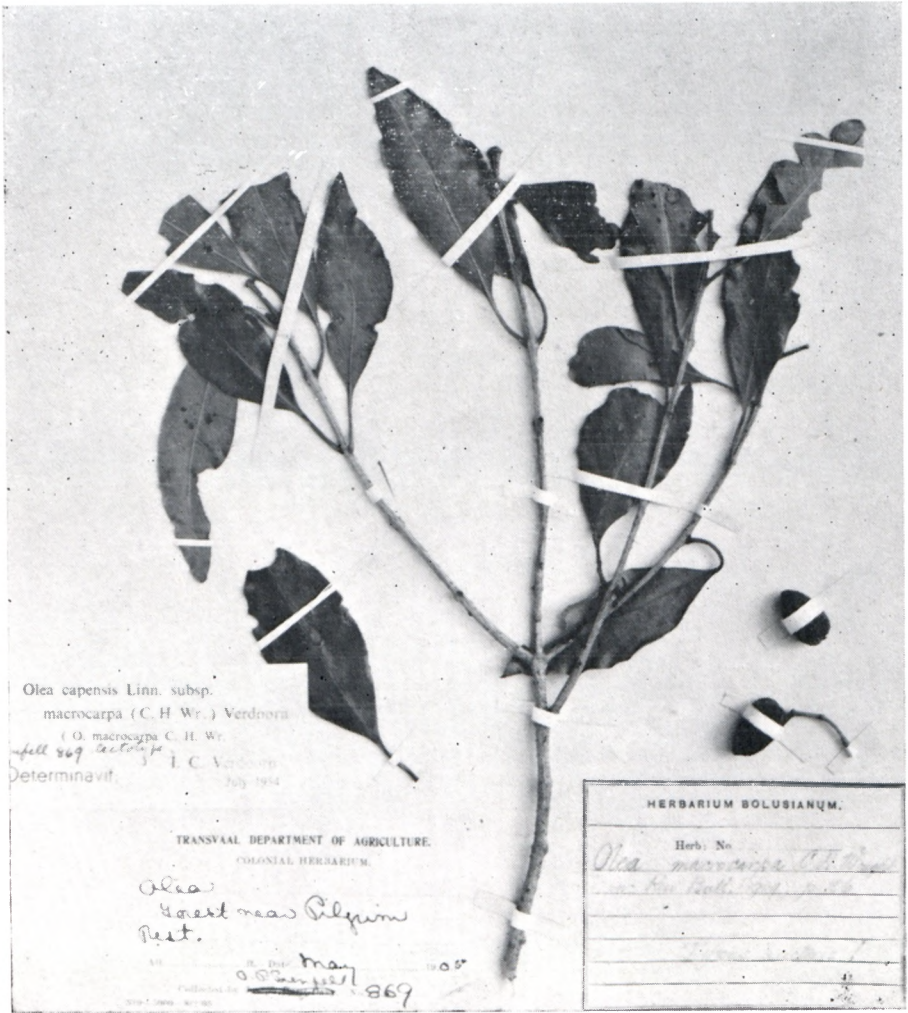


PLATE 20.—*Olea capensis* L. subsp. *macrocarpa* (C.H. Wr.) Verdoorn; Grenfell 869, isotype (BOL).



PLATE 21.—*Lionciera foveolata* (E. Mey.) Knobl. subsp. *foveolata*; Drege s.n., Uitenhage district, isotype of *L. foveolata* E. Mey.; branchlets glabrous and leaves comparatively narrow, (L).

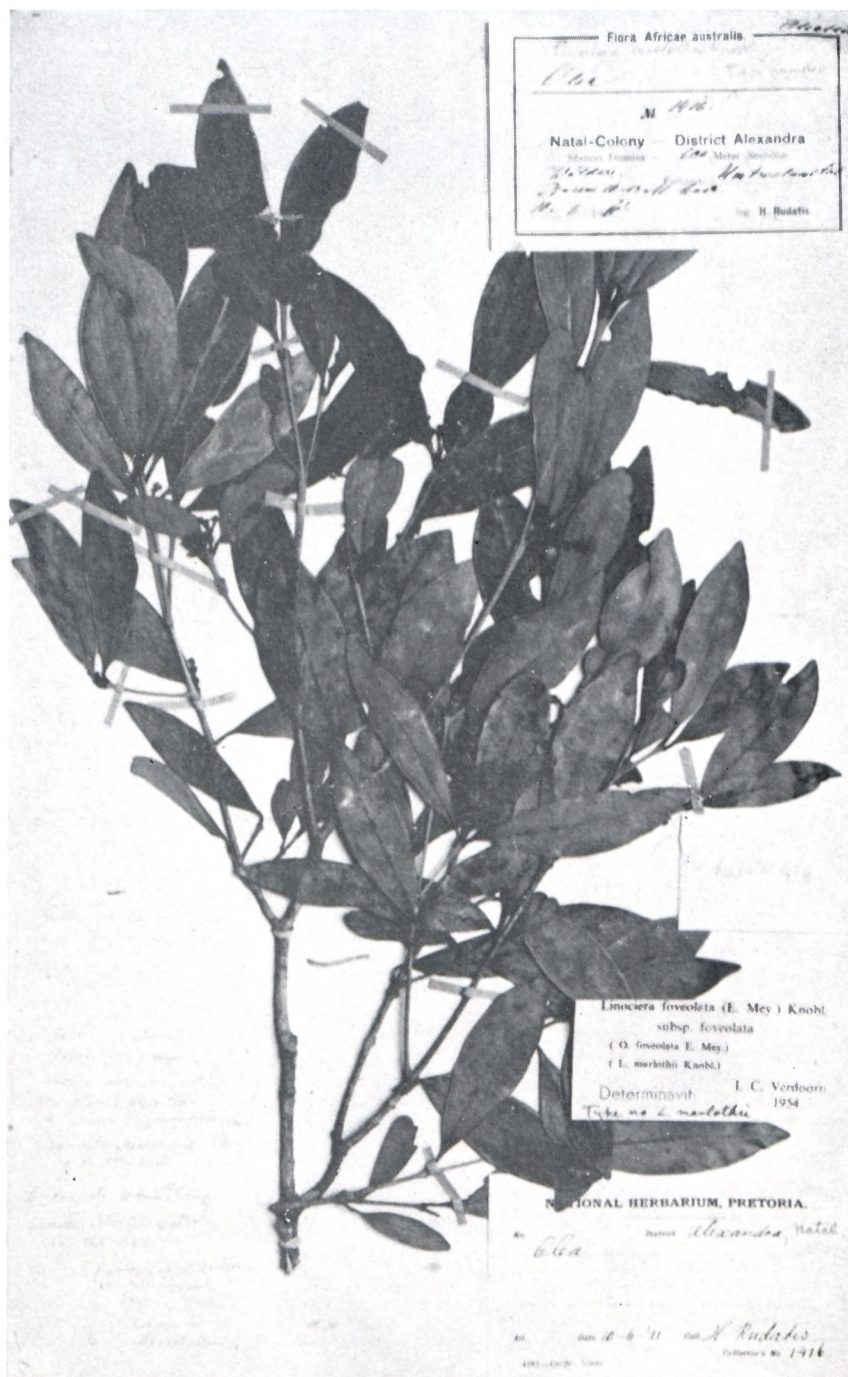


PLATE 22.—*Linociera foveolata* (E. Mey.) Knobl. subsp. *foveolata*; Rudatis 1416, Dumisa, Natal, isotype of *L. marlothii* Knobl.; leaves somewhat thinner in texture and rather longer than in more typical specimens.



PLATE 23.—*Linociera foveolata* (E. Mey.) Knobl. subsp. *tomentella* Verdoorn; a characteristic specimen from Knysna; branchlets tomentulous, leaves broadly elliptic ending in a retuse acumen.



PLATE 24.—*Linociera foveolata* (E. Mey.) Knobl. subsp. *major* Verdoorn; a specimen from the type locality, Mariëps Kop; note fruit large, though immature, ridged at apex and leaves rather broad.

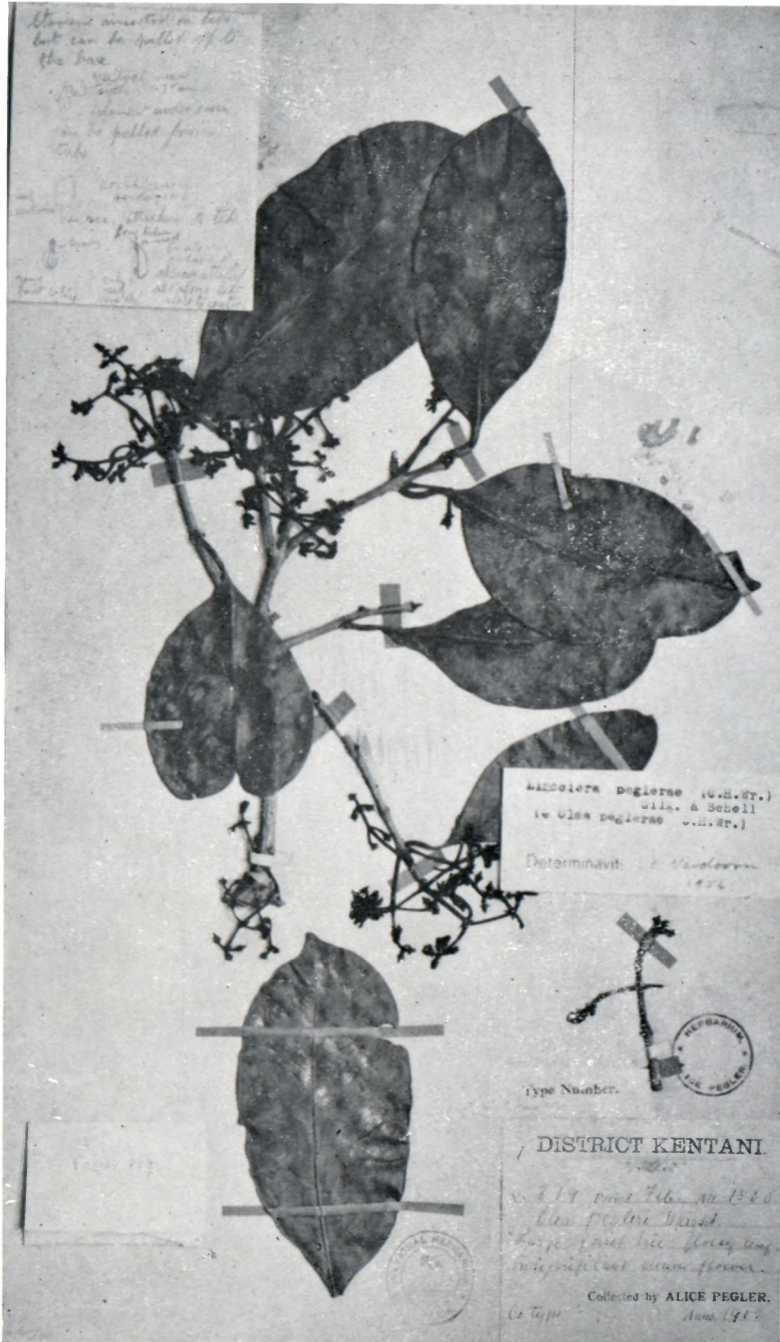


PLATE 25.—*Linociera peglerae* (C.H. Wr.) Gilg & Schellenb.; Pegler 819, from Kentani, isotype (PRE); leaves large with comparatively long petiole and blunt acumen at apex.



PLATE 26.—*Linociera battiscombei* Hutch (= *Dekindtia africana* Gilg.); specimen from Blaauwberg, Northern Transvaal; the inflorescence glomerate in the axils of the leaves.



PLATE 27.—*Menodora juncea* Harv.; specimen from Kamieskroon, Namaqualand.



PLATE 28.—*Menodora africana* Hook.; from Hooker's *Icones Plantarum*, tab. 586, figure of type.

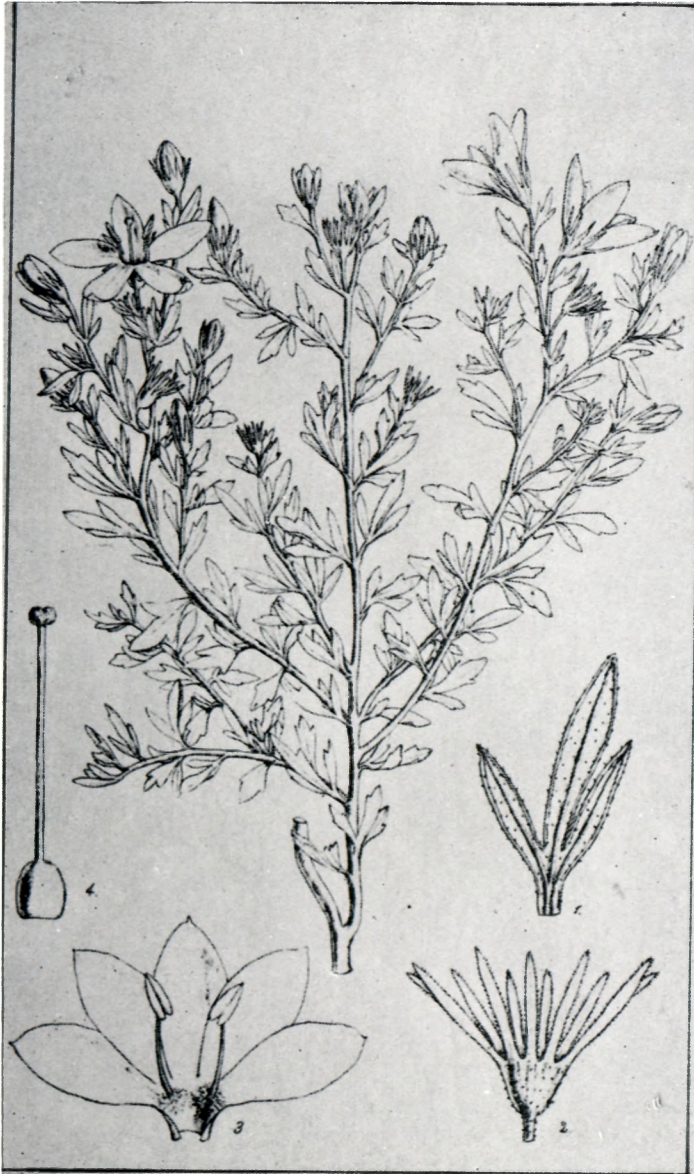


PLATE 29.—*Menodora heterophylla* Mor. ex DC. var. *australis* Steyermark;
from Hooker's *Icones Plantarum*, tab. 1459.