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Notes on East African Sapotaceae

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Résumé

KUPICHA, F. K. (1978). Commentaires sur les Sapotacées d'Afrique orientale. *Candollea* 33: 29-41. En anglais, résumé français.

Présentation du genre *Vitellariopsis* et publication formelle de *V. ferruginea* précédemment connu sous un nom impropre. Description d'une nouvelle espèce, *Vincentella muelleri,* et discussion de ses affinités génériques.

Summary

KUPICHA, F. K. (1978). Notes on East African Sapotaceae. *Candollea* 33: 29-41. In English, French abstract.

A review of *Vitellariopsis* is presented, including the formal publication of *V. ferruginea* which was previously known by a misapplied name. The new species *Vincentella muelleri* is described, with a discussion of its generic affinities.

The genus Vitellariopsis

One of the most easily recognised species of *Sapotaceae* in the "Flora zambesiaca" area is a member of *Vitellariopsis* which occurs in a restricted region in the eastern and southern provinces of Rhodesia. MEEUSE (1960) named this species *Austromimusops sylvestris* (S. Moore) A. Meeuse, based on *Mimusops sylvestris* S. Moore (MOORE, 1911).

The type of *Mimusops sylvestris* is a collection made by *Swynnerton* (No. *570*) from the Madanda Forests of Manica e Sofala province, Mozambique (not Rhodesia, cf. Meeuse); the holotype is at BM and an isotype at K.

AUBRÉVILLE (1963) pointed out that *Vitellariopsis* (Baillon) Dubard is an earlier synonym of *Austromimusops,* and made new combinations including *V. sylvestris* (S. Moore) Aubréville.

During his work on *Sapotaceae* for the "Flora of Tropical East Africa", Hemsley noticed that the type of *V. sylvestris* does not belong to the same species as the bulk of material referred to by Meeuse as *Austromimusops sylvestris,* and he suggested that *Swynnerton 570* may be a southern form of the Tanzanian *Vitellariopsis kirkii* (Baker) Dubard or, alternatively, related to the South African *V. marginata* (N. E. Br.) Aubréville as was originally indicated by

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the author of *Mimusops sylvestris*. These ideas were not published, but occur as annotations on herbarium sheets at Kew.

Meeuse himself did not see type material of *"Austromimusops sylvestris"*, but was assisted by B. de Winter who compared *Swynnerton 570* with other specimens at K. Judging from notes on a Kew specimen *(Chase 966)* in de Winter's handwriting and the remarks of MEEUSE (1960: 355), there was a misunderstanding between the two workers about which character-states occurred in which specimens, and this led Meeuse to conclude that *Swynnerton 570* was indeed representative of *"Austromimusops sylvestris"*. On the contrary, however, the latter taxon is a distinct species which needs a new name; it is described below.

Vitellariopsis ferruginea Kupicha, **spec. nova.** Fig. 1, 2.

Syn.: *Austromimusops sylvestris* (S. Moore) A. Meeuse in Bothalia 7: 354, fig. 11. 1960, excl. typ.
Vitellariopsis sylvestris (S. Moore) Aubréville – sensu R. B. Drumm. in Kirkia 10: 266. 1975, quoad specim. *Chase 964* excl. typ.

Arbor vel frutex procerus, 3-7 m altus, trunco laevi et vulnere erubescenti. Ordinatio ramificationis divaricata vel verticillata; pars proximalis virgae omnis laevigata, cicatricibus remotis, pars distalis aspera cicatricibus confertissimis; pars foliosa virgarum et petioli dense ferrugineo-pubescentes. *Stipulae* 1-2 mm longae, caducae. *Petiolus* 2-7 mm longus. *Folia* 3.5-11 x 1.3-6 cm, elliptica usque obovato-elliptica, apice rotundato vel parum emarginato, basi rotundata usque cuspidata, supra glabra, in sicco fusca, costa leviter prominenti et reti venularum subtiliter areolato, infra ferrugineo-crispato-pubescentia, glabrescentia, costa prominenti et reti venularum conspicuo. *Flores* albi usque pallide rosei, fragrantes, formosi, 1-3 in axillis foliorum portati; *pedicelli* 1-2 cm longi; alabastra et pedicelli dense ferrugineo-pubescentes. *Calyx* c. 7.5 mm longus, sepala 8 in verticillis duobus, libera, lanceolata, verticilli externi crassiora quam interni. *Corolla* c. 7.5 mm longa, petalis 8 basi c. 1.5 mm connatis; *petala* omnia 3 segmentorum composita: segmentum medium ellipticum, quam segmenta lateralia paulo brevius; segmenta lateralia ovata, apice acuminata. *Stamina* 8, c. 4 mm longa; filamenta subulata; antherae c. 3.5 mm longae, extrorsus dehiscentes. *Staminodia* 8, stamina aequantia, triangularia, dorsaliter dense albo-pilosa, versus centrum floris inclinata et stylum vaginantia. Bases filamentorum et staminodiorum breviter connatae, ad tubum corollae affixae. *Gynoecium* c. 8 mm longum, ovarium subglobosum, dense brunneo-pilosum, stylus tenuis, glaber. *Fructus* usque ad 4.5 cm longus, ovoideo-ellipsoideus, apiculatus, immaturus ferrugineo-tomentosus, maturus glabrescens, 1-2-seminalis, edulis. *Semen* usque ad 3 cm longum, ellipsoideum, testa impolita et cicatrice longa lataque.

A *V. marginata* et *V. kirkii* foliorum pagina infera crispato-pubescenti et apice rotundato vel emarginato differt.

Tree or large bush 3-7 m high with smooth bole and pink slash. Branching-pattern divaricate or verticillate, the proximal part of each twig smooth, with distant leaf-scars, the distal part rough with very crowded scars; leaves densely clustered at branch ends; leafy part of twigs and petioles with dense ferrugineous

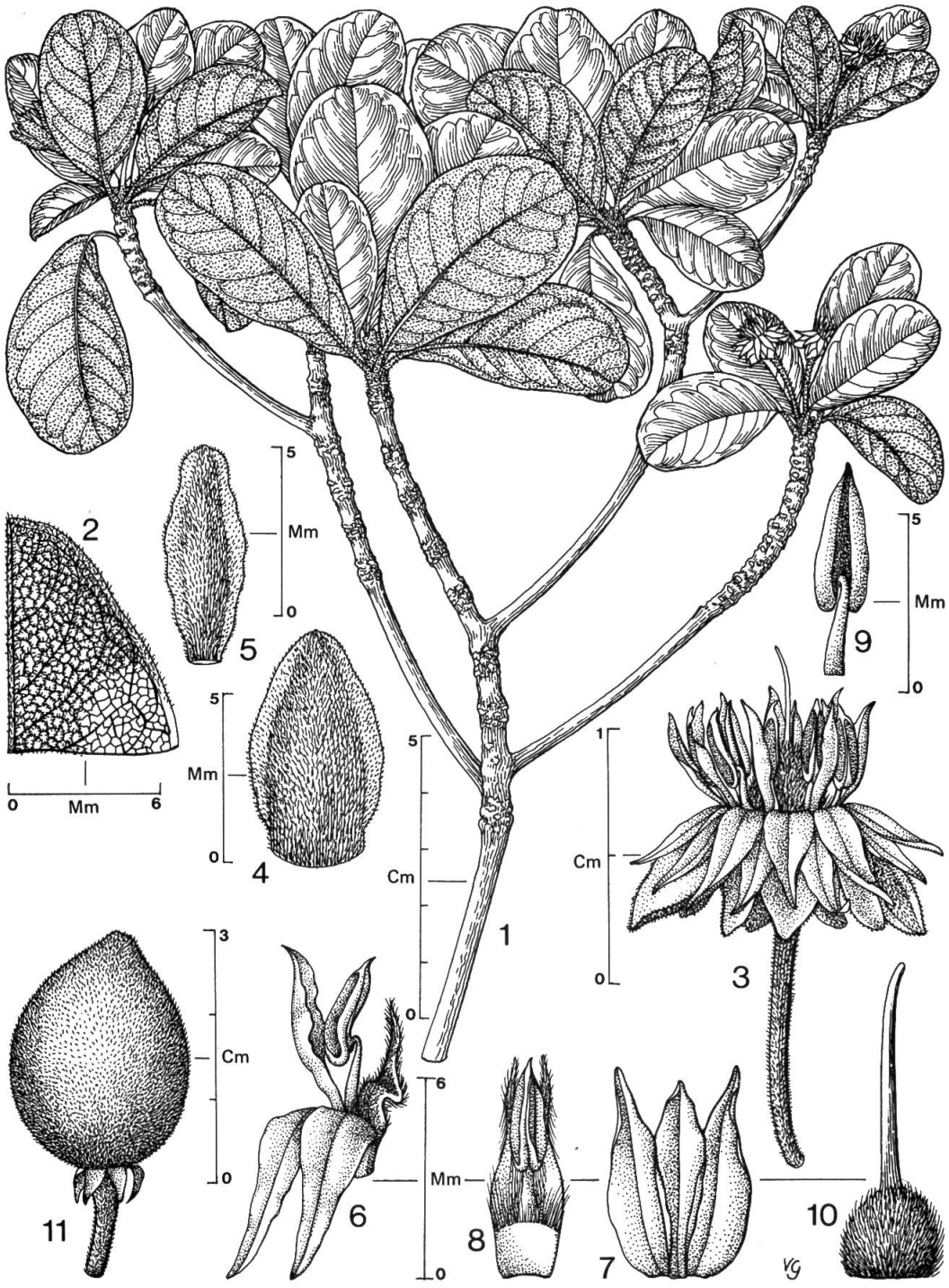


Fig. 1. – *Vitellariopsis ferruginea.*
1, habit (from *Chase 965* & *4328*); **2,** part of lower leaf surface; **3,** flower; **4,** outer sepal, dorsal view; **5,** inner sepal, dorsal view; **6,** part of corolla with stamen and staminode attached; **7,** same part of corolla showing the 3-segment petal unit; **8,** a stamen and its two adjacent staminodes, from outside of flower; **9,** stamen, from inside of flower; **10,** gynoecium (**2-10** from *Chase 965*); **11,** fruit (from *Chase 4328*).

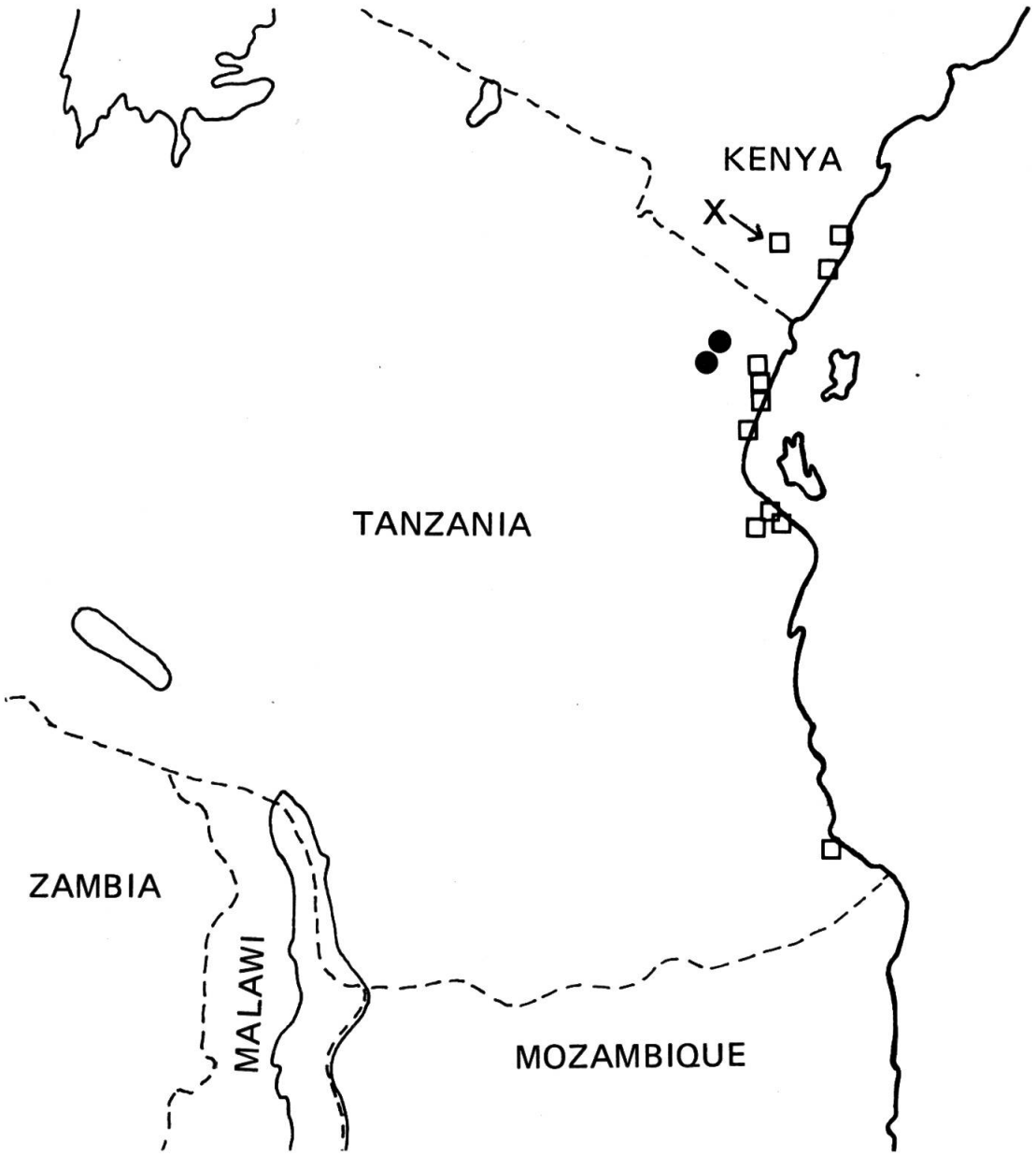
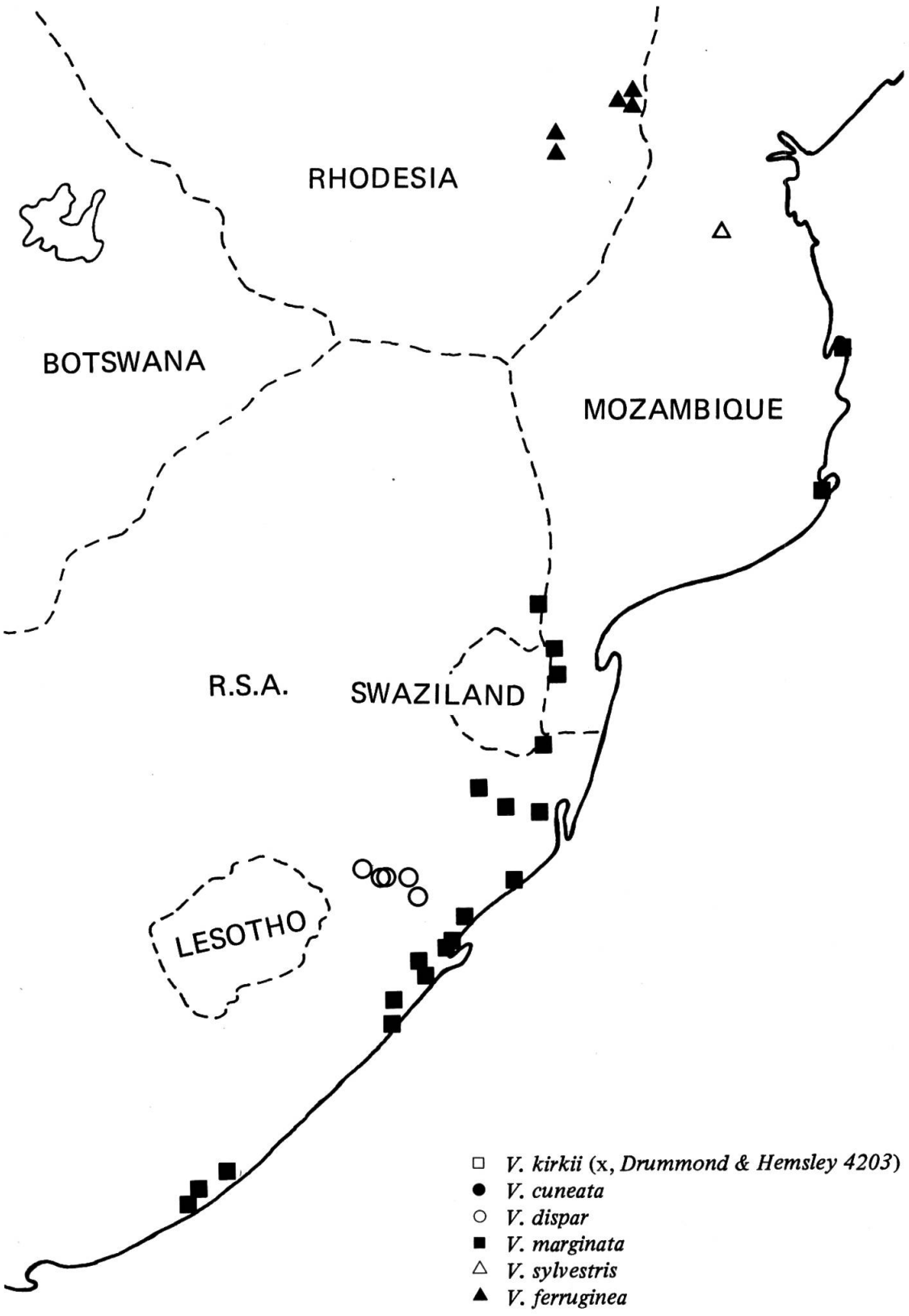


Fig. 2. – Distribution-map of species of *Vitellariopsis*.

indumentum. *Stipules* 1-2 mm long, caducous. *Petiole* 2-7 mm long. *Leaves* 3.5-11 x 1.3-6 cm, elliptic to obovate-elliptic, the apex rounded or slightly emarginate, the base rounded to cuspidate; upper surface glabrous, drying dark greyish-brown, with slightly raised midrib and finely areolate vein reticulation; lower surface ferrugineous crispate-pubescent, glabrescent, with prominent midrib and conspicuous reticulation. *Flowers* white to pale pink, scented, attractive, borne 1-3 in leaf axils; *pedicels* 1-2 cm long; buds and pedicels densely ferrugineous-pubescent. *Calyx* c. 7.5 mm long, sepals 8 in two whorls of 4, free, lanceolate, those of


RHODESIA
BOTSWANA
MOZAMBIQUE
R.S.A.
SWAZILAND
LESOTHO
□ V. kirkii (x, Drummond & Hemsley 4203)
● V. cuneata
○ V. dispar
■ V. marginata
△ V. sylvestris
▲ V. ferruginea

outer whorl of thicker texture than inner. *Corolla* c. 7.5 mm long, of 8 petals connate at base for c. 1.5 mm; each *petal* comprising 3 segments: median segment elliptic, slightly shorter than lateral segments, these ovate, tapering at apex. *Stamens* 8, c. 4 mm long; filaments subulate; anthers c. 3.5 mm long, extrorse. *Staminodes* 8, equalling stamens in length, triangular, dorsally densely whitish pilose, inclined towards centre of flower and forming a sheath round the style. Filament and staminode bases shortly connate and adnate to the corolla tube. *Gynoecium* c. 8 mm long, the ovary subglobose, densely brownish pilose, the style slender, glabrous. *Fruit* up to 4.5 cm long, ovoid-ellipsoid, apiculate, ferrugineous-tomentose when young, glabrescent, 1-2-seeded, edible. *Seed* up to 3 cm long, ellipsoid, with dull testa and long broad scar. (Fruit and seed measurements fide MEEUSE, loc. cit.; both are considerably smaller in herbarium material seen.)

Differs from *V. marginata* and *V. kirkii* by the crispate-pubescent lower surface and rounded or emarginate apex of the leaves.

Specimens seen: **Rhodesia. E**: Umtali Distr., fl. buds, 6.8.1933, *Pardy P225/33* (FHO); Umtali Distr., Dora Farm, 16 km. S. of Umtali on Melsetter road, fl., 21.11.1948, *Chase 964* (BM, holotype; K, isotype); same locality, fl., 9.1.1949, *Chase 965* (BM; COI; K; LISC; SRGH); same locality, fl., 15.1.1949, *Chase 966* (BM; COI; K; LISC; SRGH); same locality, st., 12.6.1948, *Chase 774* (BM; SRGH); Umtali Distr., Mandambiri Mt., Glenshiel Farm on Odzi R., fl. buds, 26.6.1949, *Chase 1670* (BM; COI; K; LISC); Umtali Distr., Zimunya's Reserve, 1005 m., fr., 13.1.1952, *Chase 4328* (BM; COI; K; LISC; SRGH). **S**: Moodies Pass, 945 m., fl. buds, 24.5.1959, *Noel 3883* (SRGH); Bikita Distr., 1065 m., fr., 15.12.1953, *Wild 4393* (K; LISC; SRGH); Buhera Distr., Chironga Ruins near Metindere, fl. buds, 19.11.1963, *Masterson 274* (SRGH); Bikita Distr., Benga, above Silviera Mission, st., 19.2.1965, *West 6312* (SRGH).

Rhodesian endemic. Grows apparently always on granite, in bush among boulders or on kopje summits.

Apart from *V. ferruginea,* the genus *Vitellariopsis* now comprises five taxa: *V. kirkii* (Baker) Dubard, *V. cuneata* (Engler) Aubréville, *V. sylvestris* (S. Moore) Aubréville, *V. marginata* (N. E. Br.) Aubréville and *V. dispar* (N. E. Br.) Aubréville. Their geographical distributions are plotted in Fig. 2. These five taxa are very similar, and their recognition relies as much on distributional and ecological attributes as on phenetic differences. Table 1 gives a comparison of some of their morphological features, and Fig. 3 shows silhouettes of a selection of leaves from each member of the group.

V. kirkii is found in lowland dry evergreen forest and coastal bush in Kenya and Tanzania up to an altitude of about 350 m. Its leaves are quite uniform in shape, being widest near the apex and tapering from here to an acute base. It has flowers with relatively large staminodes (4-5 mm long) and small anthers (2-3 mm). HEMSLEY (1968: 61) refers to an anomalous specimen, *Drummond & Hemsley 4203;* its locality is shown on the map (Fig. 2) and a leaf from the specimen is illustrated in Fig. 3A: x. I do not agree with Hemsley that the staminodes of this specimen are particularly large, for they measure only 5 mm, but the anthers are remarkably long, reaching 4.25 mm. The corolla tube, filaments and staminode bases are unusually swollen and fleshy, giving an impression of malformation, and

	V. kirkii	*V. cuneata*	*V. marginata*	*V. dispar*	*V. sylvestris*
Habit	shrub or tree	shrub	shrub or tree	shrub or tree	shrub or tree
Height (in m)	to 4.5	to 6.4	to 9	to 9	?
Leaf-lamina size (in cm)	4.5-10.5 x 2-4.5	5-11 x 2.5-5	4.75-13 x 1.75-5.5	2-7 x 0.75-2.5	4-7.5 x 2-3
Petiole (in mm)	3-10	5-20	6-15	3-8	6-10
Stipules	usually prominent and persistent	soon caducous	soon caducous	soon caducous	soon caducous
Pedicel (in mm)	15-26	to 25	15-40	9-20	to 18
Calyx length (in mm)	6-7	to 8	6-8	5-6	c. 6
Corolla lobe length (in mm)	6-7.5	to 7	5-8	5-6	c. 5.5
Corolla colour	white to yellow	yellow	dull white to yellow	yellowish	?
Staminodes (in mm)	4-5	to 3.5	3.5-5	c. 3	c. 3
Anthers (in mm)	2-3	3.5-4	3-4.5	2-3	3.5

Table 1. — Character-comparisons in *Vitellariopsis*

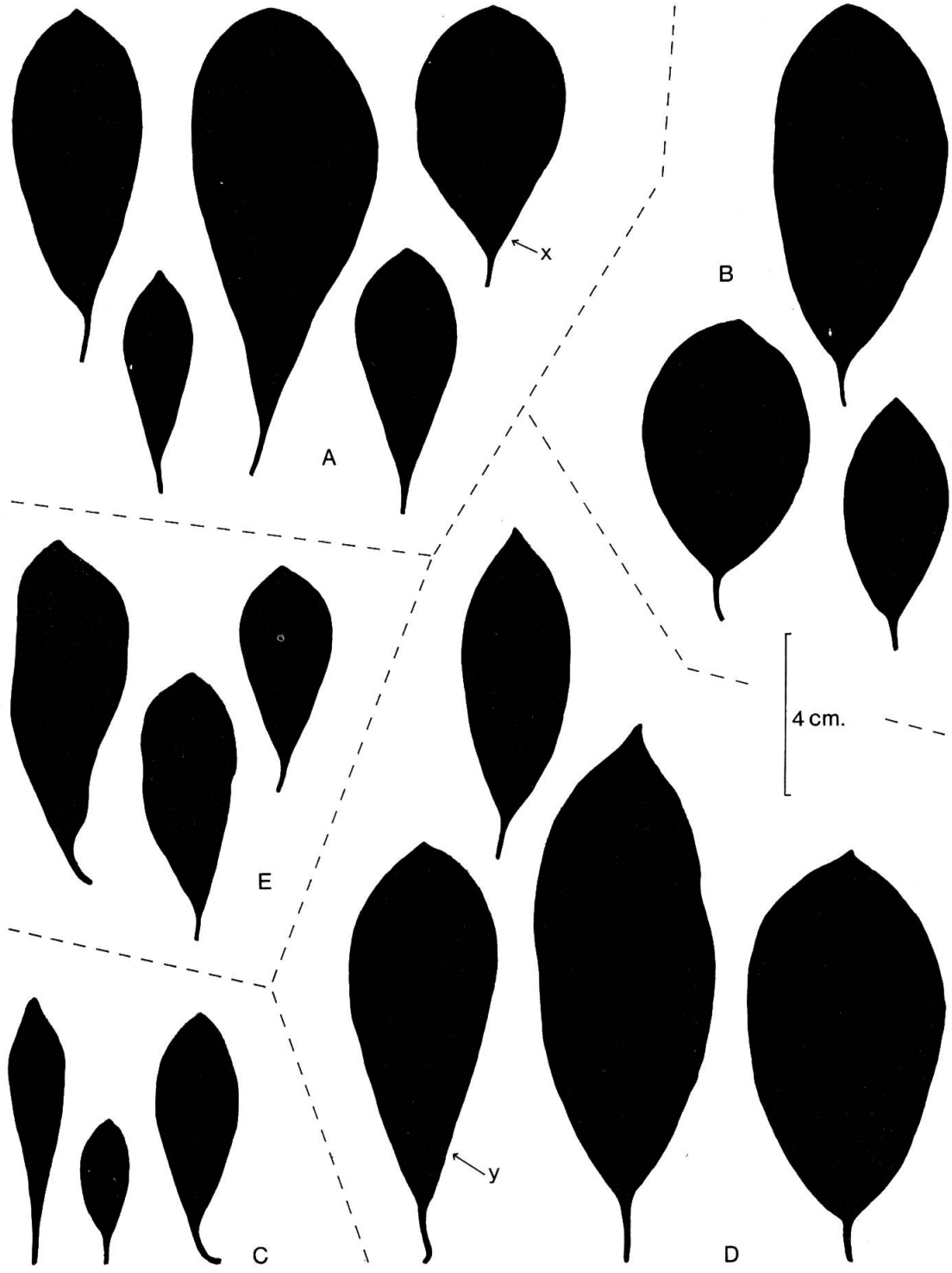


Fig. 3. – Leaf-shapes in *Vitellariopsis.*
A, *V. kirkii* (x, leaf from *Drummond & Hemsley 4203*); **B,** *V. cuneata;* **C,** *V. dispar;* **D,** *V. marginata* (y, an example of a leaf of *V. kirkii* form); **E,** *V. sylvestris.*

so it is questionable whether the large anthers have any taxonomic significance. The leaves of *Drummond & Hemsley 4203,* although proportionally rather broad, are typical of *V. kirkii* in their shape and persistent stipules.

V. marginata, the most widespread member of *Vitellariopsis,* occurs in lowland bush and frost-free forest in SE. Africa. Its leaves are variable in shape: the lamina is usually obovate-elliptic, but a few specimens have leaves approaching the *V. kirkii* form, as in Fig. 3D: y. On average, *V. marginata* has larger leaves than *V. kirkii.* It has staminodes of variable length, and relatively large anthers (3-4.5 mm long).

V. cuneata and *V. dispar* both occur at higher altitudes in restricted localities, the former on the Usambara massif in Tanzania, the latter in the Tugela region of Natal. *V. cuneata,* which is known at present from very few specimens, appears to be virtually inseparable from *V. marginata* on morphological characters. *V. dispar* is similar to *V. kirkii,* but can be distinguished by its generally smaller leaves, shorter staminodes and caducous stipules.

V. sylvestris is known only from the type specimen, which was collected in central Mozambique in open woodland at 120 m elevation. Its lowland habitat and its leaf shape and size associate *V. sylvestris* with *V. kirkii* and *V. marginata.* Some of its leaves are reminiscent of *V. kirkii,* others of typical *V. marginata,* a variation which has been seen in a few specimens of *V. marginata.* The insignificant stipules and floral measurements of *V. sylvestris* put it closer to *V. marginata* than *V. kirkii.* On this evidence, endorsed by their geographical proximity, *V. sylvestris* is judged to be a synonym of *V. marginata.*

On the basis of the information presented here, there are three alternative ways of treating this species-complex in *Vitellariopsis:*

1. *V. kirkii, V. cuneata, V. marginata* and *V. dispar* could be maintained as separate species;
2. they could all be regarded as subspecies of *V. kirkii;*
3. the two most similar taxa, *V. cuneata* and *V. marginata,* could be amalgamated and the three resulting entities treated as species or as subspecies of *V. kirkii.*

The third alternative must be rejected because the resemblance between *V. cuneata* and *V. marginata* may well be due to convergence rather than monophyly. It is difficult to decide on theoretical grounds between alternatives 1 and 2, but since it is useful to have a different binomial for each taxon I prefer to maintain them as separate species. This decision is likely to be welcomed by workers in the field, because the different taxa can easily be recognised wherever they occur as neighbours.

A new species of Vincentella

Vincentella muelleri Kupicha, **spec. nova.** Fig. 4.

Arbor vel frutex 4-7 m altus; cortex laevis, vulnus subroseum. Ordinatio ramificationis repetite subterminalis, pars proximalis virgae omnis tenuis, laevigata,

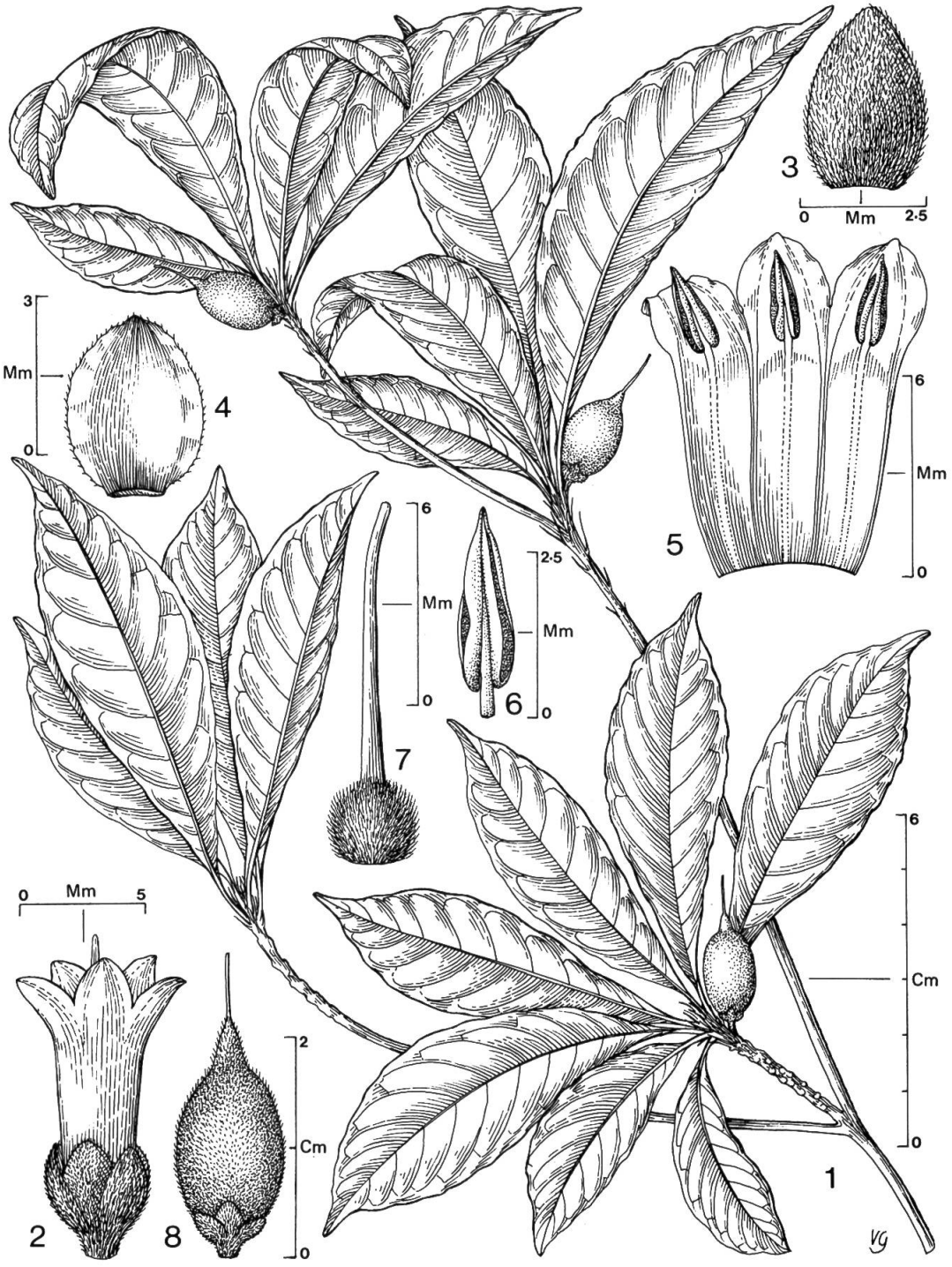


Fig. 4. – *Vincentella muelleri.*
1, habit (from *Müller 1463* & *Torre & Paiva 10301*); **2,** flower; **3,** sepal, dorsal view; **4,** sepal, ventral view; **5,** part of flower opened out; **6,** stamen, from inside of flower; **7,** gynoecium (2-7 from *Müller 1463*); 8, young fruit (from *Torre & Correia 16403*).

cicatricibus remotis, pars distalis aspera cicatricibus confertissimis et stipulis persistentibus 2-7 mm longis; apices virgarum ferrugineo-pubescentes, partes veteriores glabrae. *Folia* tenuiter coriacea, ad apices virgarum aggregata. *Petiolus* 6-16 mm longus. *Lamina* 6-16.5 x 1.8-4 cm, oblongo-elliptica usque anguste obovato-oblonga, apice obtuse cuspidato-acuminato, basi acuminata, supra glabra, costa et nervis lateralis 7-11-jugis impressis, infra nervis prominentibus, praeter costam appresso-pubescentem glabra. *Flores* (4)5-meri, solitarii, sessiles, ad apices virgarum cum foliis necnon in trunco portati. *Calyx* 3-4 mm longus, cupulatus; lobi ovati usque suborbiculati, plus minusve ad basin liberi, imbricati, dorsaliter appresso-pubescentes. *Corolla* alba, 7-10 mm longa, tubularis, lobis usque ad 3 mm longis; lobi area incrassata media ovata et alis tenuibus lateralibus, alae propinquae interdum connatae. *Stamina* petalis opposita, ad basi loborum inserta; antherae 1.75-2.5 mm longae, introrsum dehiscentes, sessiles vel filamentis usque ad 1 mm longis. *Staminodia* absentia. *Ovarium* globosum, c. 2 mm longum, appresso-pilosum; stylus 5-6 mm longus, tenuis. *Fructus* maturus non vidi sed (fide collectoris) roseus, carne alba et semine uno (?) nitido brunneo.

Pachystelae subverticillatae primo adspectu maxime similis, sed differt floribus solitariis, corollae tubo longo, antheris introrsis, filamentis brevissimis.

Tree or shrub 4-7 m tall; bark smooth, slash pinkish. Branching-pattern repeatedly subterminal, the proximal part of each branch slender, smooth, with long internodes, the distal part rough with densely crowded nodes and persistent stipules 2-7 mm long; branch apices ferrugineous-pubescent, older parts glabrous. *Leaves* thinly coriaceous, clustered at branch ends. *Petiole* 6-16 mm long. *Lamina* 6-16.5 x 1.8-4 cm, oblong-elliptic to narrowly obovate-oblong, the apex bluntly cuspidate-acuminate, the base acuminate; upper leaf surface glabrous, with impressed midrib and lateral nerves, these 7-11-paired; lower surface with raised nerves, glabrous except for the presence of appressed hairs on the midrib and sometimes also on the lateral nerves. *Flowers* (4)5-merous, solitary, sessile, borne at branch apices with the leaves as well as on the trunk. *Calyx* 3-4 mm long, cup-shaped; lobes ovate to suborbicular, ± free to base, imbricate, dorsally appressed-pubescent. *Corolla* white, 7-10 mm long, tubular, lobed to c. 3 mm at the apex; lobes with ovate median area of thicker texture and lateral wings of thinner tissue by which neighbouring lobes are sometimes united. *Stamens* equalling corolla lobes in number, oppositipetalous, inserted at level of base of lobes; anthers 1.75-2.5 mm long, introrse, subsessile or with filaments up to 1 mm long. *Staminodes* absent. *Ovary* globose, c. 2 mm long, appressed-pilose; style 5-6 mm long, slender. Mature *fruit* not seen but stated *(Müller 1463)* to be pink with white flesh and containing 1 (?) shiny brown seed.

At first sight very close to *Pachystela subverticillata,* but differing in the solitary flowers, long corolla tube, introrse anthers and very short filaments.

Specimens seen: **Malawi. S**: Mlanje Distr., Ruo Gorge, c. 900 m., fl., 1.9.1970, *Müller 1463* (K, holotype; SRGH, isotype); Mlanje Plateau, st., 24.10.1929, *Burtt Davy 22131* (FHO). **Mozambique. N**: Ribáuè, serra de Mepalué, c. 1500 m., fl. bud, 28.1.1964, *Torre & Paiva 10301* (LISC); same locality, c. 1600 m., fr. immat., 9.12.1967, *Torre & Correia 16403* (LISC). **Z**: Gúruè, confluence of Malema and Cocossi Rs., c. 1650 m., fl. & fr. immat., 6.11.1967, *Torre & Correia 15921* (LISC).

In *Newtonia* medium-altitude montane forest and in dense humid riverine forest.

Note. One flower of *Müller 1463* (SRGH) was found to have 4 corolla lobes and 6 anthers, and the corolla united into a complete tube; other flowers of the same collection, however, seem to be of normal form.

Vincentella muelleri belongs to the group of African sapotaceous genera which is characterised by having normally 5-merous flowers, 1-seeded fruits and exalbuminous seeds. The number of genera comprising the group is uncertain, but it includes *Afrosersalisia* A. Cheval., *Aningeria* Aubréville, *Bequaertiodendron* De Wild., *Malacantha* Pierre, *Pachystela* Pierre ex Engler and *Vincentella* Pierre. These little genera are poorly defined, while their species, by contrast, tend to be individually distinctive. *V. muelleri* is not only another such easily-recognised species, but its characters are partly unique and partly bridge the small gaps between several of the genera currently recognised by taxonomists in this area.

Table 2 summarises the evidence which shows affinity between *V. muelleri* and other taxa. It is not known whether any of the listed characters are relatively

		Characters of Vincentella muelleri
Pa. subvert.	1.	Branch ends with conspicuous crowded persistent stipules.
Af. Pa. Vi.	2.	Leaves glabrous except for appressed-pubescent nerves of lower surface.
Af. Pa. Vi.	3.	Leaf venation type: lateral nerves not closely parallel or spanned by conspicuous tertiary veins.
Af. Pa. Vi.	4.	Leaf-lamina not pellucid-punctate.
Be. nat.	5.	Flowers solitary.
Vi. muell.	6.	Corolla tube longer than lobes, lobes partially united by thin lateral wings.
Af. An. Be. Pa. Vi.	7.	Stamens inserted at top of corolla tube.
Af. An. Be.	8.	Anthers subsessile.
(Be.) Ma.	9.	Anthers introrse.
(Be.) Ma. (Pa.)	10.	Staminodes absent.

Af. character-state typical of *Afrosersalisia,* **An.** of *Aningeria,* **Be.** of *Bequaertiodendron* (**Be. nat.,** of *B. natalense* only), **Ma.** of *Malacantha,* **Pa.** of *Pachystela* (**Pa. subvert.,** of *P. subverticillata* only), **Vi.** of *Vincentella (Vi. muell.,* character-state peculiar to *V. muelleri).* A genus in parenthesis, e.g. **(Be.),** shows the character-state is present in some, but not all, of its members.

Table 2. — A comparison between *Vincentella muelleri* and some other members of the *Sapotaceae* in East Africa.

specialised and therefore deserve extra taxonomic weighting. The vegetatively most similar species is the Kenyan *Pachystela subverticillata,* which was itself considered doubtfully placed in *Pachystela* by HEMSLEY (1968: 39). *Bequaertiodendron natalense* (Sond.) Heine & J. H. Hemsley is rather more alike in flower characters, but its exstipulate leaves, with their closely spaced parallel lateral veins and densely appressed silvery indumentum, are very different.

V. muelleri does not fit within the present concept of any genus, and so to conform with the system it would be necessary to create a new genus for it. However, because I have no confidence in the generic classification in this part of the family, the make-shift measure of placing the new species in the oldest genus of the affinity has been adopted, in the hope that future workers will rationalise the situation and amalgamate most of the segregate genera. This can only be done after detailed research over a wide geographical area, which unfortunately is outside my scope at present.

Acknowledgements

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