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## Miscellaneous notes on the flora of Tropical East Africa, including descriptions of new taxa, 33-36

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This is the ninth paper <sup>1</sup> of a series on the above subject which the author proposes to continue.

### 30. *Euphorbia turbiniformis*, a species "non satis nota"

E. Chiovenda based his description of this species (Flora Somalia 1 : 304, tab. 35, fig. 1. 1937) on two sterile gatherings: *Riva* 385 from Giacorso in the Sidamo Prov. of Ethiopia, 1200 m appr., and *Stefanini & Puccioni* 701 from Dhur and Hossa in the coastal region of Migiurtina in the Somalia Republic. The latter specimen is figured and shows a plant with a napoid root and an obconical, simple stem with flattened,  $\pm$  circular apex; the apical depression mentioned in the text does not show on the illustration but can be clearly seen on the specimen itself which is otherwise quite featureless: it lacks the tessellate-tubercular surface as well as the small, round, horny shields crowning the tubercles.

These are present in *Riva* 385 from Giacorso, the stem of which is not, however, turbinate but compressed-globose, a shape which explains why Chiovenda considered the species to belong to A. Berger's Section VII, *Meleuphorbia*.

The two gatherings are not—as an examination shows—conspecific, and Chiovenda's description combines characters which belong to two different plants (fig. 1).

Considering that *Stefanini & Puccioni* 701 conforms with the epithet chosen by the author and is moreover figured under that name, it is the obvious choice as the lectotype of *Euphorbia turbiniformis* Chiov. It must be stressed, however, that it refers to a "species non satis nota".

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<sup>1</sup> Previous papers: *Candollea* 17 : 25, 53, 71. 1959; *l.c.* 18 : 9, 335. 1962-63; *l.c.* 19 : 145. 1964; *l.c.* 20 : 13. 1965; *l.c.* 21/1 : 3. 1966.

*Erratum*: It is regretted that in the paper published before last in this series (*Candollea* 20 : 13 1965) three taxa received no number. They are the following:

30 : The identity of *Ceropegia nilotica* Kotschy. — 31: *Ceropegia seticorona* E. A. Bruce and an undescribed variety. — 32: *Euphorbia balsamifera* Ait. in Arabia and in Tropical East Africa.

The specimen *Riva* 385 with its subglobose, many-angled, tessellate-tubercular, simple stem is not only specifically distinct, it is not even possible at this stage to speculate on its affinities; it seems to stand quite apart among the East African succulent *Euphorbiae*. Flowering and fruiting material are required for a fuller understanding of this very interesting species.

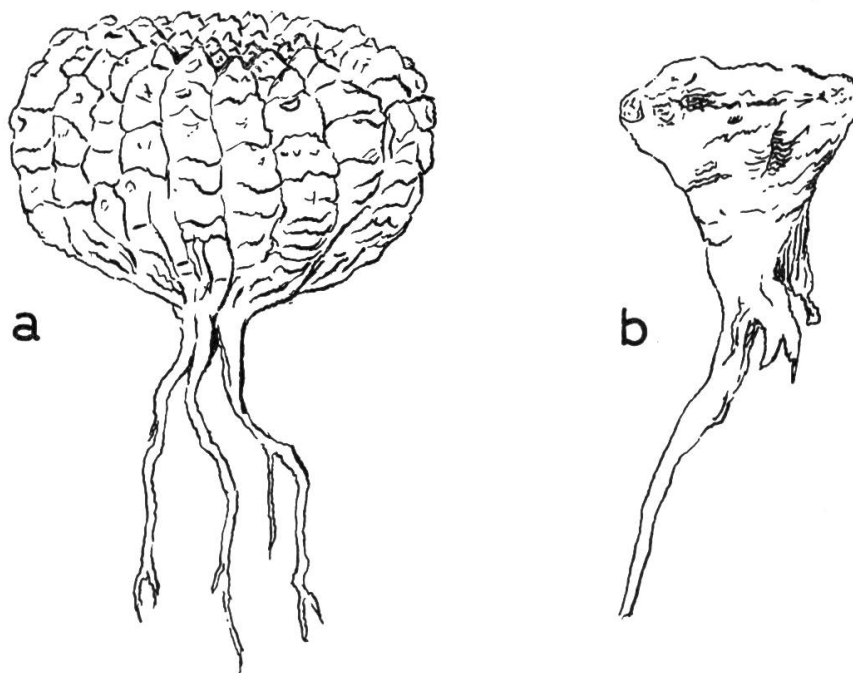


FIG. 1. — *Euphorbia turbiniformis* Chiov.

a: *Riva* 385 (*Euphorbia* spec.) — b: *Puccioni & Stefanini* 701 (*Euphorbia turbiniformis*, lectotype).

The misleading original description of *E. turbiniformis* has occasioned a misidentification in J. B. Gillett on "The plant forms of British Somaliland and the Harar Province of Ethiopia" (Kew Bull. 1941 : 112), where his number 4241 collected in Hargeisa was identified with it, while it is, in fact, an undescribed species of a geophytic habit and by its spinescence related to *Euphorbia monacantha* Pax. The new species from Hargeisa is described hereunder as *Euphorbia immersa*.

31. *Euphorbia immersa* spec. nov.

***Euphorbia immersa*** Bally et Carter, spec. nova (fig. 2)

Species affinis *Euphorbiae monacanthae* Pax sed in omnibus partibus minor, caule subterraneo, ramis multo brevioribus, spinis saepe deficientibus differt.

*Planta* carnosa exigua. *Radix* napiformis. *Caulis* valde carnosus, subterraneus, apice truncato, applanato. *Rami* 5-15, cylindrici vel subtriangulares, carnosi, erecti, 0.4-2.4 cm longi, 6-8 mm crassi, obtuse dentati vel tuberculati; tuberculi scutellis obtuse triangularibus, parum decurrentibus, 1.5-2 mm longis, 1.25-1.5 mm latis, interdum spinam unicam,

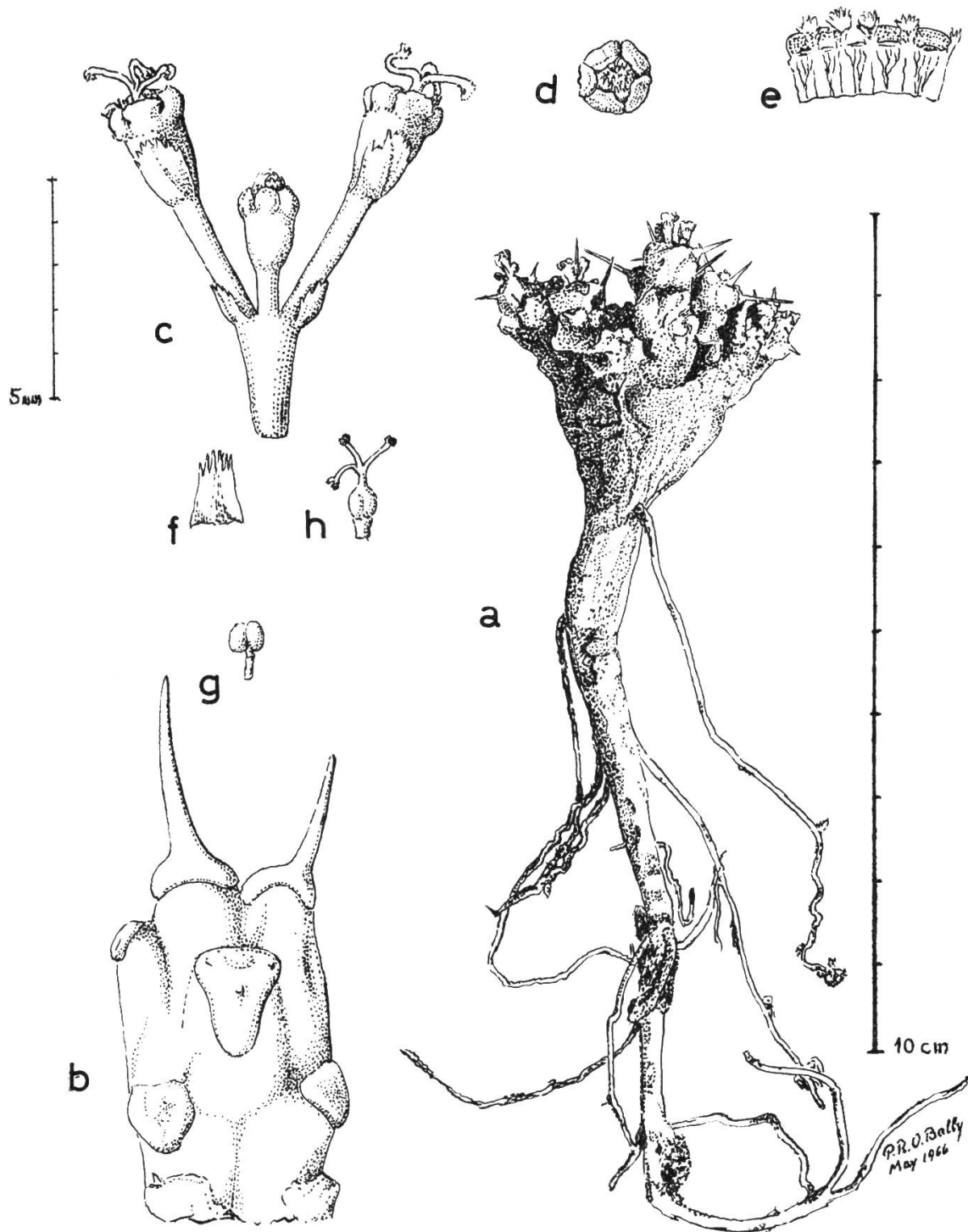


FIG. 2. — *Euphorbia immersa* spec. nov. Bally & Carter

*a:* whole plant. — *b:* sterile branch. — *c:* cyme. — *d:* involucre seen from above. — *e:* involucre cut open and spread to show glands and lobes. — *f:* involucre bract. — *g:* staminate flower. — *h:* pistillate flower.

1.5-2.5 mm longam gerentibus coronati. *Folia* squamiformia minuta caduca. *Cymae* paucae, axillares, ex parte superiore ramorum productae, semel furcatae, pedunculatae; pedunculus bibracteatus, teres, 2.5-3 mm longus, 1-1.5 mm crassus; cymae rami 1.5-3.25 mm longi, 0.5-0.75 mm crassi. Involucrorum *bracteae* oppositae, membranaceae, persistentes, 1.7-2.5 mm longae, 1-1.2 mm latae, ovatae vel triangulares, margine superiore fimbriatae. *Involucrum* anguste cupuliforme, glandulis inclusis 2.5-2.75 mm longum, 1.25-2 mm diametro; glandulae  $\pm$  erectae, reniformes vel subrotundae, 0.75 mm longae, 0.75-1 mm latae, carnosae, glabrae, margine integro; lobi membranacei, fimbriati, glandulas excedentes, 0.5 mm longi et lati. *Flores* masculi pedicellati: pedicellus 0.5-1 mm longus; filamentum 0.1-0.25 mm longum; bracteolae haud visae. *Flos femineus* breviter pedicellatus, pedicello 0.5 mm longo; ovarium obtuse trilobatum; styli 3, 1-1.25 mm longi, basi breviter (0.3 mm) connati apice breviter bifidi, incrassati, rugulosi. *Capsula*, ut semen, ignota.

A dwarf, succulent *plant*, glabrous in all parts. *Root* beet-like merging into a short, thick subterranean *stem*, from the flattened top of which arise 5-15 erect, fleshy, terete *branches*, 0.4-2.4 cm long, 6-8 mm thick; branches obtusely dentate or tuberculate, tubercles crowned by obtusely triangular, slightly decurrent spine-shields, 1.5-2 mm long, 1.25-1.5 mm wide, occasionally bearing a solitary spine, 1.5-2.5 mm long. *Leaves* minute, scale-like, caducous. *Cymes* few, axillary, arising from the upper part of the branches, once forked; peduncle 2.5-3 mm long, terete, cyme-branches slightly shorter. Involucral *bracts* opposite, membranous, triangular to rounded, 1.7-2.5 mm long, 1-1.2 mm wide, fimbriate. *Involucre* 2.5-2.75 mm long including the glands, 1.25-2 mm diam., funnel-shaped; glands erect, reniform to subrotund, 0.75 mm long, 0.75-1 mm wide, fleshy, yellow, margin entire; lobes 5, membranous, rounded, fimbriate, exceeding the glands, 0.5 mm high and wide. *Staminate flowers* with pedicel 0.5-1 mm long, filament 0.1-0.25 mm long, anther-cells paired, 0.75 mm long. *Pistillate flower* with 3-lobed, ovary, shortly pedicellate, pedicel 0.5 mm long; styles 3, shortly (0.3 mm) united at the base, 1-1.25 mm long, style-arms spreading with thickened, rugulose, bifid tips. *Capsule* and seed not seen.

The Somali near Hargeisa call the plant "denegu". Its latex is not irritant like that of most other succulent *Euphorbias*; herdboys and other children collect it by thrusting a small branch into its center and revolving it; the coagulating latex adheres to the branch and is then used like chewing gum.

**DISTRIBUTION.** SOMALI REPUBLIC NORTH: Hargeisa, stony ground, both on limestone and sandstone; succulent, top flush with ground, flowers yellow, sap smelling of coconut, 1350 m, 10° 8' N, 43° 0' E, 10.10.1932, *J. B. Gillett 4241* (holotype K); ibid. 18.1.1944, *Bally E270* and 19.2.1954, *Bally B9692 (a)*; Gaan Libah, 1800 m, 9° 31' N, 44° 05' E, Aug. 1945, *P. E. Glover in Bally E281*.

### 32. *Euphorbia wakefieldii*

This tree-Euphorbia is named after the Rev. Wakefield, who discovered it near Ribe in Kenya in 1880. It was since found in one other locality on the Kenya coast and also in the South Pare hills in Tanzania, in isolated, very restricted stands.

The type-specimen on which N. E. Brown based his description consists of a single slender branchlet or seedling, a fragment which must have suggested to him

a dwarf succulent rather than a tree; he referred to it somewhat ambiguously as "a perennial". The actual habit of the plant thus remained uncertain for many years.

The present writer visited the reputed type locality repeatedly without finding it, and indeed, with its lush coastal forest vegetation Ribe itself is not a likely habitat for a small succulent *Euphorbia*.

Some years later, in February 1947, when collecting along Mwachi Creek South of Mombasa I came across a stand of this very rare species on an outcrop of jurassic limestone. The slender, 3-angled, wavy-edged branches with their needle-like spine-pairs left no doubt as to its identity with Wakefield's plant, but they belonged to a tree 5-7 m high.

In the East African Herbarium I subsequently came across a pressed specimen from the same locality collected by F. B. Butler in 1921, but, together with a gathering from the South Pare Hills in Tanzania, found by P. J. Greenway, it had remained unidentified.

In the early fifties Alan Delap found the tree at Chonyi, only 7 miles North of Ribe, again on a small outcrop of limestone which is presumably Wakefield's original locality.

*E. wakefieldii* has no near affinity with any of the other arborescent *Euphorbias* in East Africa; it is more closely related to the South African *E. grandidens* Haw. and to *E. evansii* Pax, but it is smaller and its trunk remains unbranched.

The seedlings of *E. wakefieldii* are characteristic: the first lateral branches grow disproportionally long and are pendulous; they trail on the ground and occasionally develop rootlets where they touch the soil; they can thus give rise to vegetative propagation.

***Euphorbia wakefieldii*** N. E. Br. in Fl. Trop. Afr. 6/1 : 583. 1912. (This paper fig. 3)

A tree of palm-like growth, 7-15 m high. *Roots* weak, Fibrous *bole* cylindrical, erect, pitted with scars of fallen branches; bark light grey. *Crown* rounded, composed of relatively few, short, thin, winged branches; secondary branching sparse, somewhat tufted. *Branchlets* 3-4-angled, not segmented, 5-25 cm long, about 25 mm diam., slightly constricted at intervals; angles distinctly toothed, teeth  $\pm$  10 cm apart, to 5 mm high, crowned with spine-shields bearing a pair of slender, needle-like spines up to 10 mm long; spineshields narrowly triangular, 4-10 mm long, including the crescent-shaped leafscar with 2 minute, sometimes obsolete stipular prickles; shield decurrent to about 5 mm. *Leaves* produced terminally on young growths, minute, scale-like, caducous. *Flowering eyes* solitary, 2-5 mm above the spine-pair, not included in the spineshield. *Cymes* subsessile or very shortly pedunculate, once forked, about 8 mm high, 11 mm diam; peduncle 2 mm long, 2.5 mm thick. *Involucre*: bracts triangular, 1.6 mm long, 2 mm wide at their thickened base, membranous, keeled, deciduous; central involucre all-male, lateral involucres bisexual, 3 mm high, 4 mm diam. including the glands; lobes 5, erect, subquadrate, 1.2 mm high, 1 mm wide, upper margin sparsely lacinate; glands 5, reniform, glabrous, upper surface minutely pitted, yellow, 2 mm long, 1-1.5 mm wide, margin entire, inner margin slightly raised. *Staminate flowers*: filament 0.75 mm long, anther-cells paired, dehiscent, pale yellow. *Pistillate flower*: pedicel reflexed, terete, fleshy; ovary distinctly 3-lobed, glabrous; style-branches shortly united at the base, 1.5 mm long, united 1 mm, with bifid, thickened tips. Mature *capsule* and *seed* not seen.

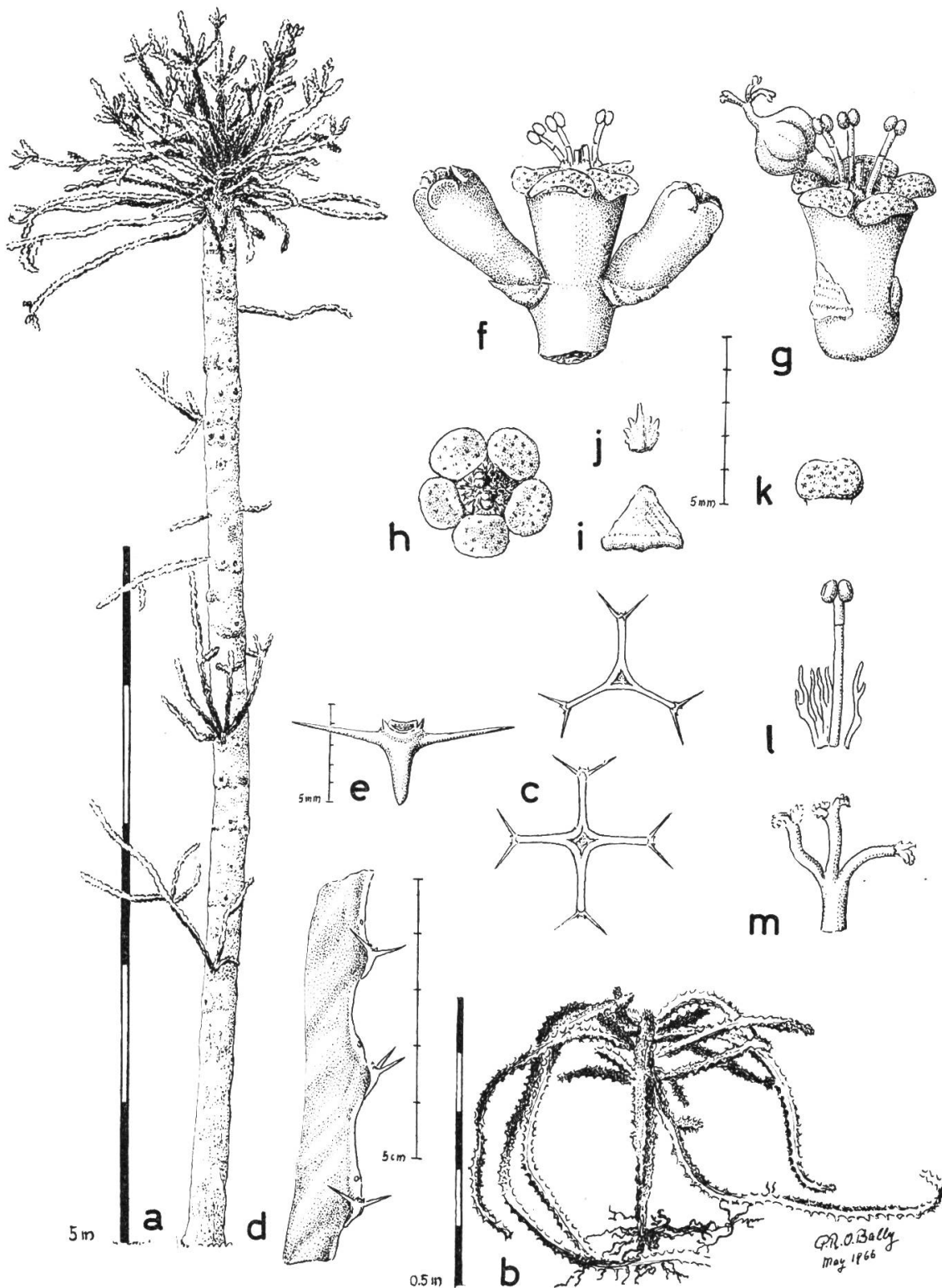


FIG. 3. — *Euphorbia wakefieldii* N. E. Br.

*a*: mature tree. — *b*: seedling. — *c*: branchlets, cross sections. — *d*: margin with spines. — *e*: spine-shield. — *f*: cyme. — *g*: involucre (lateral bisexual) side view. — *h*: involucre (central male) top view. — *i*: involucral bract. — *j*: lobe. — *k*: gland. — *l*: male flower with bracteoles. — *m*: pistil (from Bally E 321).





MAP 1. — Distribution of *Euphorbia wakefieldii* (+), *Euphorbia turbiniformis* (\*), *Euphorbia immersa* (•) and of the specimen "Riva 385", an *Euphorbia* spec. (x).

DISTRIBUTION. KENYA: Coast Prov. Mombasa Distr., Ribe, 3° 54' S, 39° 38' E, May 1880, *Rev. Wakefield* (K type); West of Miritini Station, on Mwachi Creek, 15.11.1921, *F. B. Butler* 21; *ibid.*, 4° 03' S, 39° 32' E, 6.2.1948, *Bally* B5780; Chonyi, 7 miles N of Ribe, 3° 48' S, 39° 41' E, *Alan Delap* (living plant in Kew). TANGANYIKA: Tanga Prov., South Pare Hills, above Hedaru, 1000-1500 m, 4° 30' S, 37° 57' E, 9.7.1942, *P. J. Greenway*.

### 33. *Caralluma wilsonii* spec. nov.

*Caralluma wilsonii* spec. nov. (fig. 4)

Affinis *Carallumae commutatae* Berger, sed ramis decumbentibus, ramorum dentibus longioribus, corollis setosis, coronae sacculis minoribus distinguitur.

*Planta* succulenta, glabra. *Caules* carnosi, decumbentes, 5-6 cm longi, quadrangulares, angulis dentatis; dentes arcte dispositi, ad 2 cm longi, in apice attenuati, folio unico, lanceolato, subulato, mox deciduo coronati. *Flores* 2 mm intervallo supra dentium basin siti, pseudo-umbellati, praecipue prope ramorum apicem in numero 2-6 singulatim et deinceps nascentes. *Pedunculus* in tuberculum 2 mm altum et crassum redactus; bractee minutissimae, subulatae, ca. 0.25 mm longae; pedicellus 2-3 mm longus, teres. *Sepala* 5, anguste lanceolata, 2.75-3 mm longa, acuta, *Corolla* rotata, extus pallide viridis, glabra, intus flava, sparse et



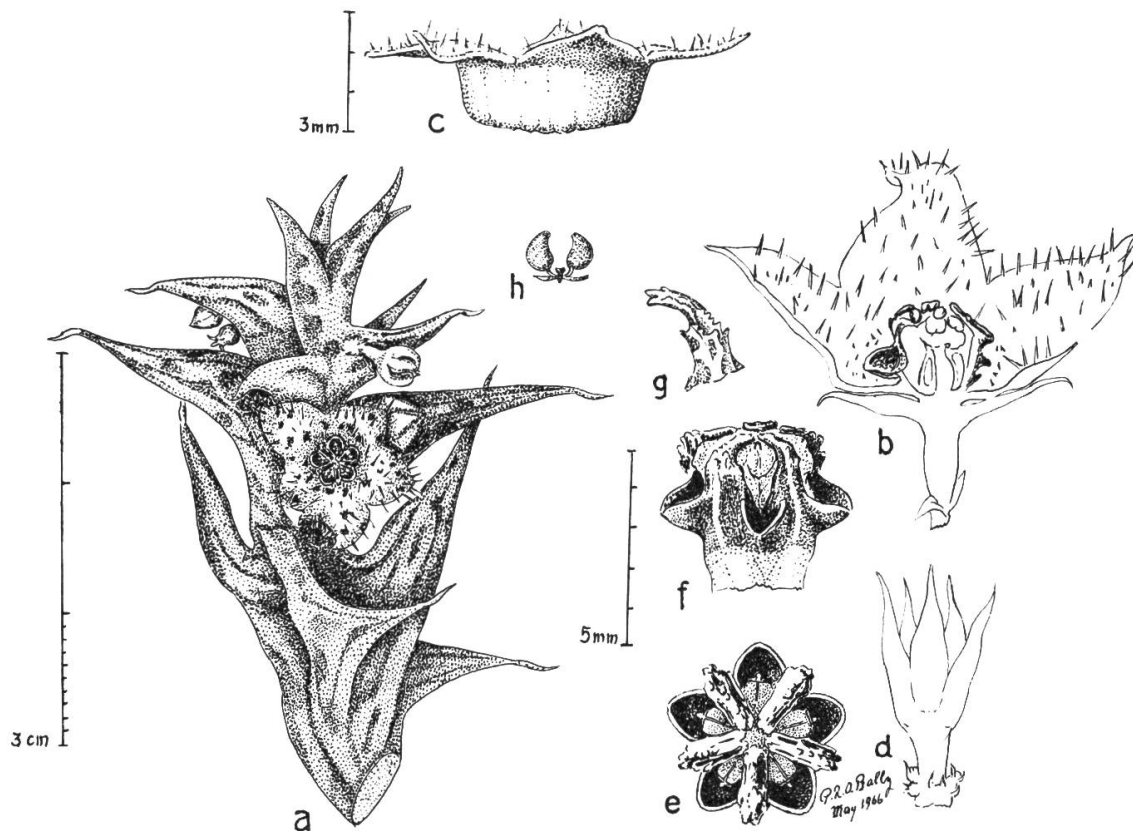


FIG. 4. — *Caralluma wilsonii* spec. nov.

a: flowering growth. — b: flower, cross-section. — c: corolla, side-view. — d: calyx with pedicel and reduced peduncle. — e: corona, viewed from above. — f: corona, viewed from the side. — g: inner corona-lobe. — h: pollen masses.

irregulariter rubrimaculata, pilis acutis, atripurpureis, 0.2-0.8 mm longis sparse instructa; corollae tubus tenuiter patellatus, 6 mm diametro latus, 2-2.5 mm altus; lobi triangulares, patentes, apicibus acutis, reflexioribus, 3.5 mm longi, in basi 3.2 mm lati. *Corona* 3 mm alta et lata, glabra, atripurpurea; lobi exteriores sacculos rotundatos, 1.5 mm latos et profundos, in margine integros formantes; lobi interiores in inferiore parte erecti, apicibus loriformibus, interdum bifidis, supra gynostegium incumbentes, in dorso cristati. *Folliculum* et semen haud visa.

A dwarf, glabrous, fleshy plant; roots weak, fibrous. Stems decumbent to semi-erect, quadrangular, 5-6 cm long, glaucous green with maroon mottling, toothed along the angles with longitudinal grooves between them; teeth slender, to 2 cm long, spreading-ascending, acute, terminating in subulate-lanceolate leaves 4 mm long. Inflorescences subumbellate, few, in the upper part of stems, few-flowered; flowers 2-6 produced consecutively. Peduncle reduced to a tubercle 2 mm high and wide with linear bracts 0.75-0.5 mm long; pedicels 2-3 mm long, terete glabrous, Sepals 2.75-3 mm long, narrowly elliptic, acute. Corolla: tube shallow, 6 mm wide, 2-2.5 mm high; lobes triangular, acute, 3.5 mm long, 3.2 mm wide at the base, spreading, with reflexed tips: outer surface glabrous, greenish yellow; inner or upper surface lemon-yellow with small, scattered, irregularly shaped purple dots and laxly beset with stiff, acute, purple bristles, varying in length from 0.2-0.8 mm. Corona 3 mm high and wide, dark purplish maroon, outer lobes united to form small spreading



MAP 2. — Distribution of *Caralluma wilsonii* (+).

pouches, 1.5 mm diam., sharply projecting halfway up the staminal column; inner lobes narrowly triangular with a wattled dorsal crest, erect in their lower half, their tips obtuse and sometimes bifid, incumbent over the staminal column. *Follicles* and *seeds* not seen.

**DISTRIBUTION.** UGANDA: Toro Distr., about 30 miles S of Kasese, Queen Elisabeth Park, near Mweya Lodge, *J. Wilson* 13. 1963.

The closest affinity of this species appears to be the Arabian *Caralluma commutata* Berger, with which it shares the very shallow corolla tube, the pouch-like outer corona lobes and the crested narrow inner lobes; it differs from the latter by the decumbent stems with longer, slenderer teeth, the smaller, setose corolla and the smaller pouches of the outer corona lobes. The type of *C. commutata* is not extant and we have to rely entirely on Berger's description and drawing published in A. Berger's "Kleinien und Stapelien" (1903).

I have much pleasure in dedicating this species to its discoverer, Mr. J. G. Wilson C. D. A., F. R. G. S., who has contributed a great deal to our knowledge of the vegetation and in particular of the succulents of the Karamoja District in Uganda.

