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Autor: Bally, P. R. O.
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Miscellaneous notes on the flora of Tropical East Africa, including descriptions of new taxa, 16-22

P.R.O. BALLY

Conservatoire et Jardin botaniques, Genève

This is the sixth paper ¹ of a series on the above subject which the author proposes to continue.

16. *Sansevieria pinguicula* (*Agavaceae*)

Sansevieria pinguicula Bally spec. nov.

Affinis *Sansevieriae roridae* (Lanza) N.E. Br. in *Kew Bull.* 1915 : 205, sed foliis rosulatis haud distichis, minus numerosis, brevioribus, crassioribus, scapo multo brevioris folios haud superante, floribus minoribus distinguitur.

Herba erecta, carnosa, glabra 20-30 cm alta, subacaulis, rhizomatosa, foliis 5-7, erecto-patentibus, rosulatis, percrassis, omnino uniformiter viridibus, 12-30 cm longis, infra dimidium 2.8-5.5 cm diametro, apicem versus attenuatis, cuspidatis, in apice lignosis, acutis. *Folia* supra profunde canaliculata, marginibus canalium acutis, brunneo-lignosis; subtus striis 2-7, longitudinalibus \pm profundis notata; sectione transversali $\frac{3}{4}$ - circulari, in latere intus spectante concavo-angulata, usque ad 7 mm profunda, marginibus angustissimis acutis, brunneo-lignosis; extus 2-7-striata. *Scapus* pseudoterminalis erectus, cylindricus, folia haud superans, 15-32 cm longus, in basi 5-6 mm diametro, apicem versus sensim attenuatus, in dimidio superiore ramosus, bracteis membranaceis, 1-2 infimis sterilibus, caeteris racemiferis instructus. *Racemi* 6-9, horizontaliter patentes, inferiores 5 cm longi, apicem versus breviores, densiflori, in singulis nodis 4-6 floriferi, pedicellis 1.5-2 cm longis. *Perianthi* tubo cylindrico, in basi vix inflato, 4-5 mm longi, 6 lobis 3-4 mm longis, 0.75-1 mm latis, staminibus perianthio aequilongis, filamentis in basi loborum ortis, 1.6 mm longis, antherarum thecis binis, 2 mm longis, stylo stamina vix superante.

An erect, fleshy, glabrous, short-stemmed plant to 30 cm high; leaves 5-7, rosulate, uniformly green, thickly fleshy, 12-30 cm long, 2.8-3.5 cm thick just below the middle, tapering towards the cuspidate, horny, very sharp tip; upper surface deeply channelled,

¹ Previous papers : *Candollea* 17 : 25, 53, 71.1959; *l.c.* 18 : 9,335.1962-63.

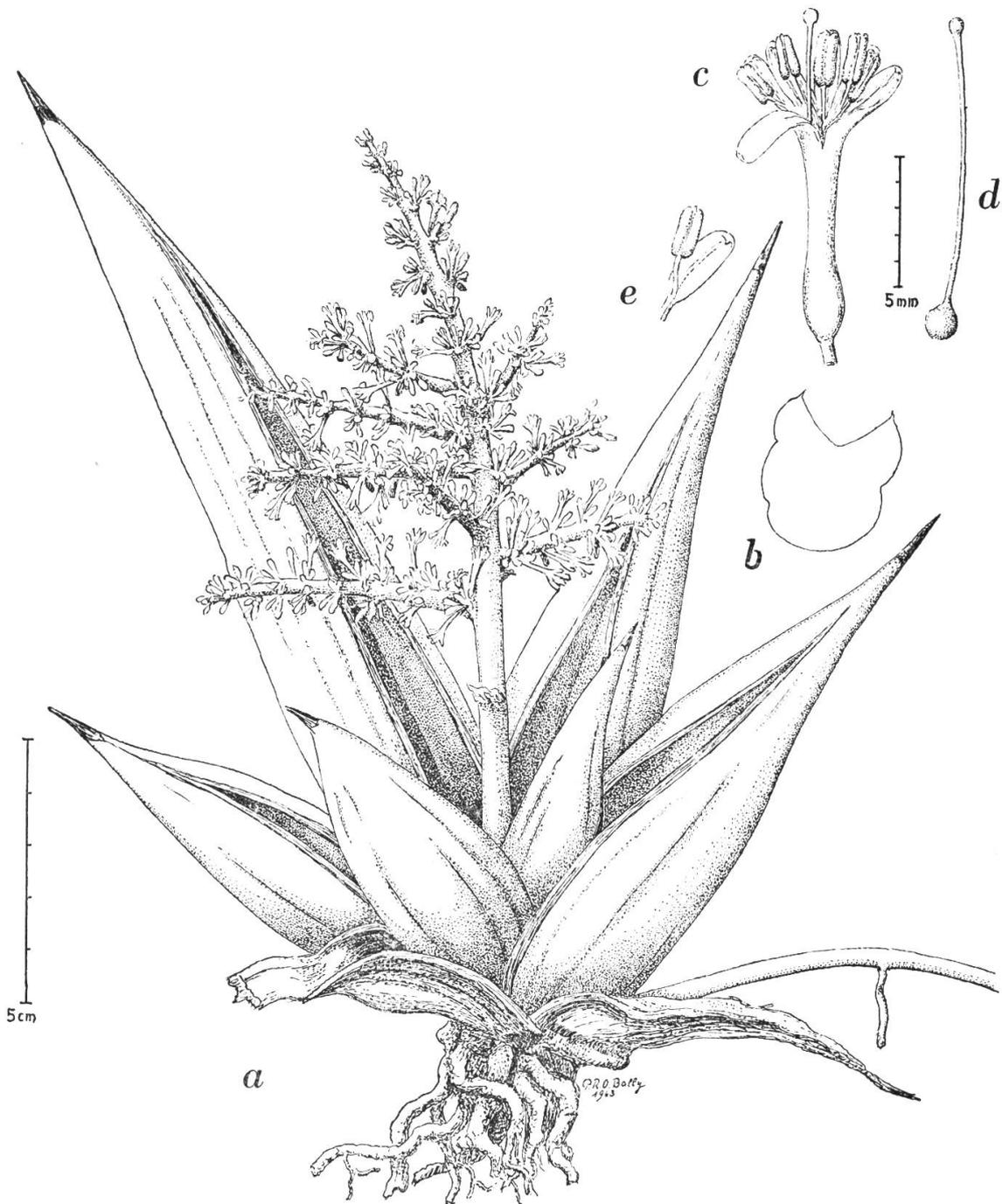


FIG. 1. — *Sansevieria pinguicula* Bally
 a, plant in flower — b, cross section through leaf — c, flower — d, pistil — e, stamen with anther cells. From *Bally 4275*.

margins of the channel sharp, brown, horny, underside rounded, with 2-7 more or less well defined longitudinal grooves; in cross-section leaves semicircular, the side facing inwards concave-angular with narrow horny edges, the outer, convex side 2-7-dented. Flowering stem subterminal, erect, cylindrical, equalling or hardly exceeding the leaves, 15-32 cm long, 5-6 mm diam. at the base, gradually tapering towards the apex, branched in the upper half. Bracts membranous, broadly triangular, acute, the 1-2 lowest sterile, the upper ones subtending the branchlets. Branchlets 6-9, horizontally spreading, the lowest to 5 cm long, the upper branchlets increasingly shorter. Racemes densely beset with flowers, 4-6 on each node; pedicel 1.5-2 mm long. Perianth tube cylindrical, 4-5 mm long with a slightly inflated base; lobes 3-4 mm long, 0.75-1 mm wide; stamens equalling the perianth, filaments free from the base of the lobes, free portion 1.6 mm long, anther cells paired, 2 mm long; style filiform, slightly exceeding the anthers.

Distribution. KENYA: Northern Frontier Prov., Tana River region, near Bura, 120 m alt., 1°05' S, 39°52' E, Jan. 1943, *Bally B 4275*, (K. holo); 20 miles N.E. of Garissa, in sandy plains, 230 m alt., 0°15' S, 39°50' E, 12.10.1953, *Bally B 9386*.



FIG. 2. — Distribution of *Sansevieria pinguicula*.

17. *Euphorbia carteriana* (Euphorbiaceae)***Euphorbia carteriana*** Bally spec. nov.

Affinis *Euphorbiae* thi Schweinf. in *Verhandl. Zool.-Bot. Gesell. Wien* **18**:660. 1868 sed caulibus magis ramosis, patentibus, angulis paucioribus, tenuioribus, cymis plus furcatis, longe pedunculatis differt.

Frutex succulentus multiramis usque 2 m altus 2-3 diametro, ramis patentibus, 3-4-angulatis, irregulariter alatis et dentatis, 5-34 mm latis, dentibus 0.5-4 cm distantibus; alae ramorum tenue compressae. Scutella decurrentia, 1-2.5 mm lata, marginem continuum, rarius interruptum, formantia. Spinae binae, divergentes, robustae, in partibus latis ramorum ad 1.5 cm longae, in basi 2.5 mm latae, in partibus angustatis ramorum 0.5 mm vel ultra longae; aculei bini minuti. *Folia* haud visa. *Cymae* in apicibus ramorum congregatae, axillares, 2-3-furcatae; pedunculus 7-13 mm longus, clavatus, teres, in apice 5 mm, in basi 3 mm crassus; cymae rami gradatim breviores. Involucrum bractearum oppositae, mox deciduae, subtriangulares, membranaceae, 3.5 mm longae, in basi usque 4 mm latae, carinatae, in apice irregulariter dentatae. Involucrum cupuliforme, 5 mm longum, in apice cum glandulis 8-10 mm latum, glabrum; glandulae 5, contiguae, rhomboideae, 2.5-3 mm longae, 4.5 mm latae, carnosae, flavae, margine integro; lobi 5, subquadrati, 2 mm longi et lati, margine superiore fimbriato. *Flores masculi*: filamentum 1 mm longum, antherarum thecae 1 mm longae. Bracteolae 2 mm longae, membranaceae, laciniatae, glabrae. *Flos femineus*: ovarium subsessile, glabrum; calyx breviter trilobatus, lobis brevissimis, triangularibus, emarginatis. Styli 3.5 mm longi, in basi 1.5 mm connati, ramis patentibus, apicibus bifidis haud incrassatis. Capsula et semina haud visa.

A much-branched, spiny, succulent shrub to 2 m high, 2-3 m diam., with spreading, 3-4-angled irregularly winged and toothed branches, wings 5-34 mm wide, teeth 0.5-4 cm distant; wings thinly fleshy. Spine-shields decurrent, 1-2.5 mm wide, forming a continuous, seldom interrupted margin along the angles. Spines paired, divergent, straight or somewhat

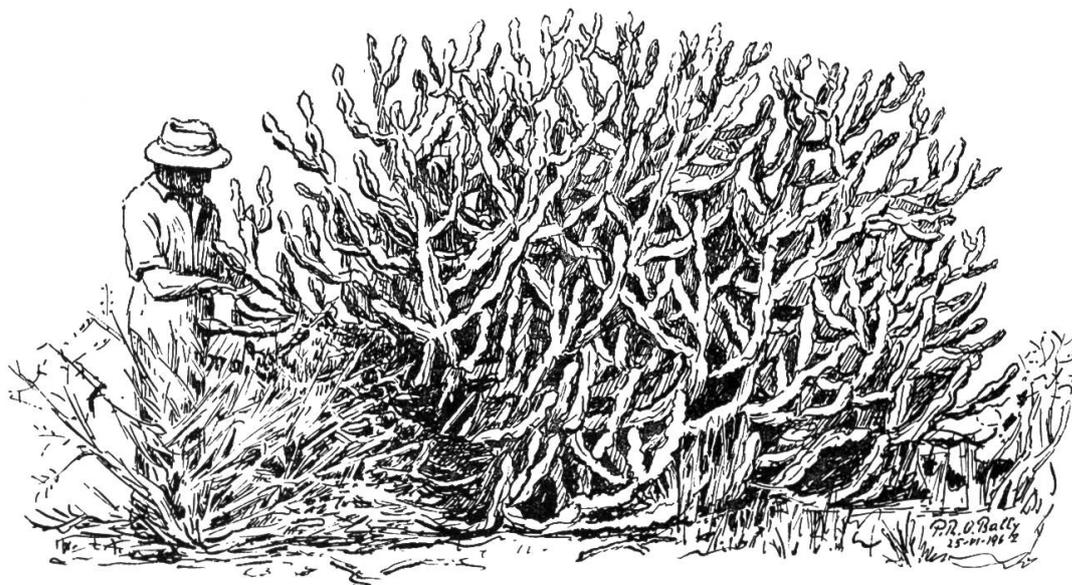


FIG. 3. — Habitus from Bally 9395: *Euphorbia carteriana*.

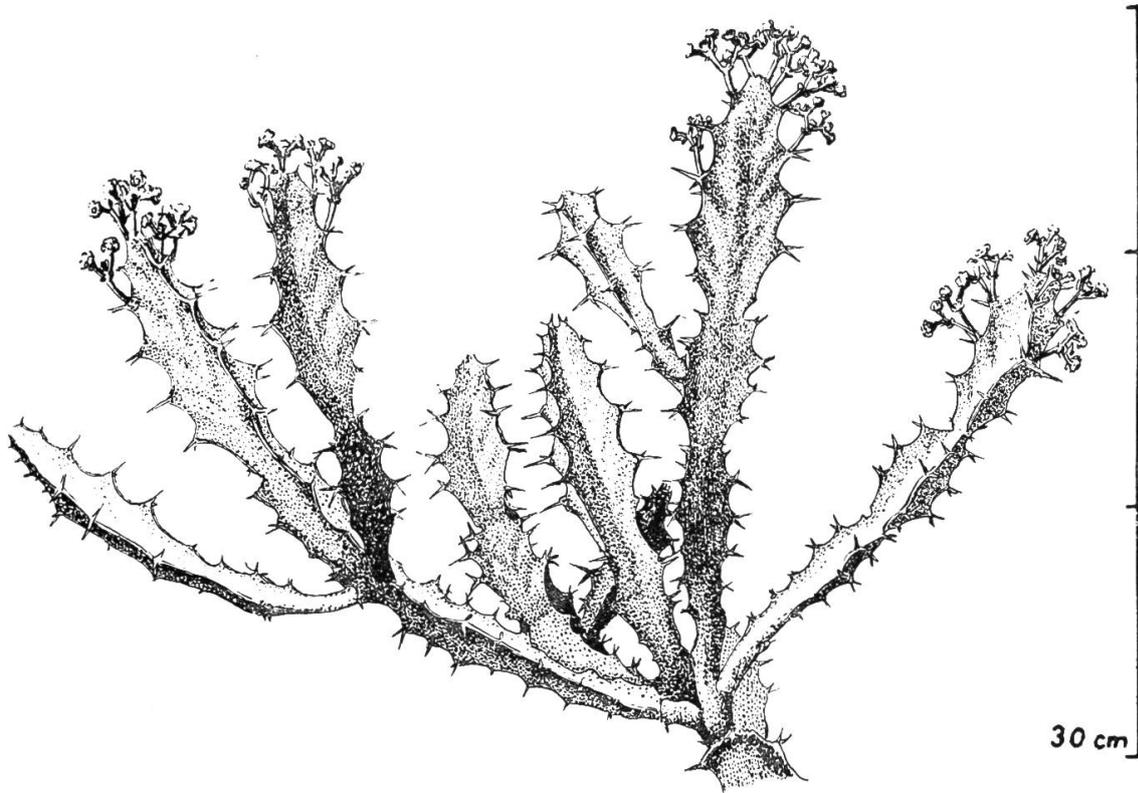


FIG. 4. — *Euphorbia carteriana*: flowering branch from *Bally* 9395

reflexed, to 1.5 cm long on the widest parts of the wings, to 2.5 mm thick at the base; in the constricted portions of the branches 0.5 mm long. prickles paired, minute. Leaves not seen. Cymes produced terminally on the branches, 2-3 times forked. Peduncles 7-13 mm long, cylindrical, 5 mm diam. at the slightly thickened apex, 3 mm thick at the base; cyme branches progressively shorter. Involucral bracts opposite, subtriangular, membraneous, 3.5 long, to 4 mm wide at the base, keeled down the middle, irregularly dentate. Involucre cup-shaped, 5 mm long, 8-10 mm diam. including the glands, glabrous; glands 5, contiguous, rhomboid, 2.5-3 mm long, 4-4.5 mm wide, fleshy, yellow, margin entire; lobes 5, subquadrate, 2 mm long and wide, upper margin fimbriate. Staminate flowers numerous, pedicel 1.5-2 mm long, filament 1 mm long, anther cells paired, 1 mm long, yellow; bracteoles 2 mm long, membraneous, laciniate, glabrous. Pistillate flower solitary, absent in the central involucre (immature only seen) subsessile on a short peduncle; perianth reduced to 3 triangular, emarginate lobes; styles 3.5 mm long, united at the base, free parts 2 mm long, spreading, with thickened, bifid tips. Capsule and seeds not seen.

Distribution. Tropical East Africa: SOMALI REPUBLIC SOUTH, Webi Scebeli Prov., between Lugh Ferrandi and Afgoi, with *Euphorbia grandicornis*, 300 m alt., Dec. 1941, *Strangways-Dixon* 9 in herb. *Bally* E 107; 3-4 miles North of Mogadiscio, coastal region, sandy soil, 100 m alt., 2°7' N, 45°24' E, 30.12.1943, *Bally* E 307; Gersale, 41 miles N of Mogadiscio, 100 m, 2°38' N, 45°24' E, on sandy soil with sparse desert scrub, 8.10.1953, *Bally* B 9395; 8 miles North of Villagio Duca degli

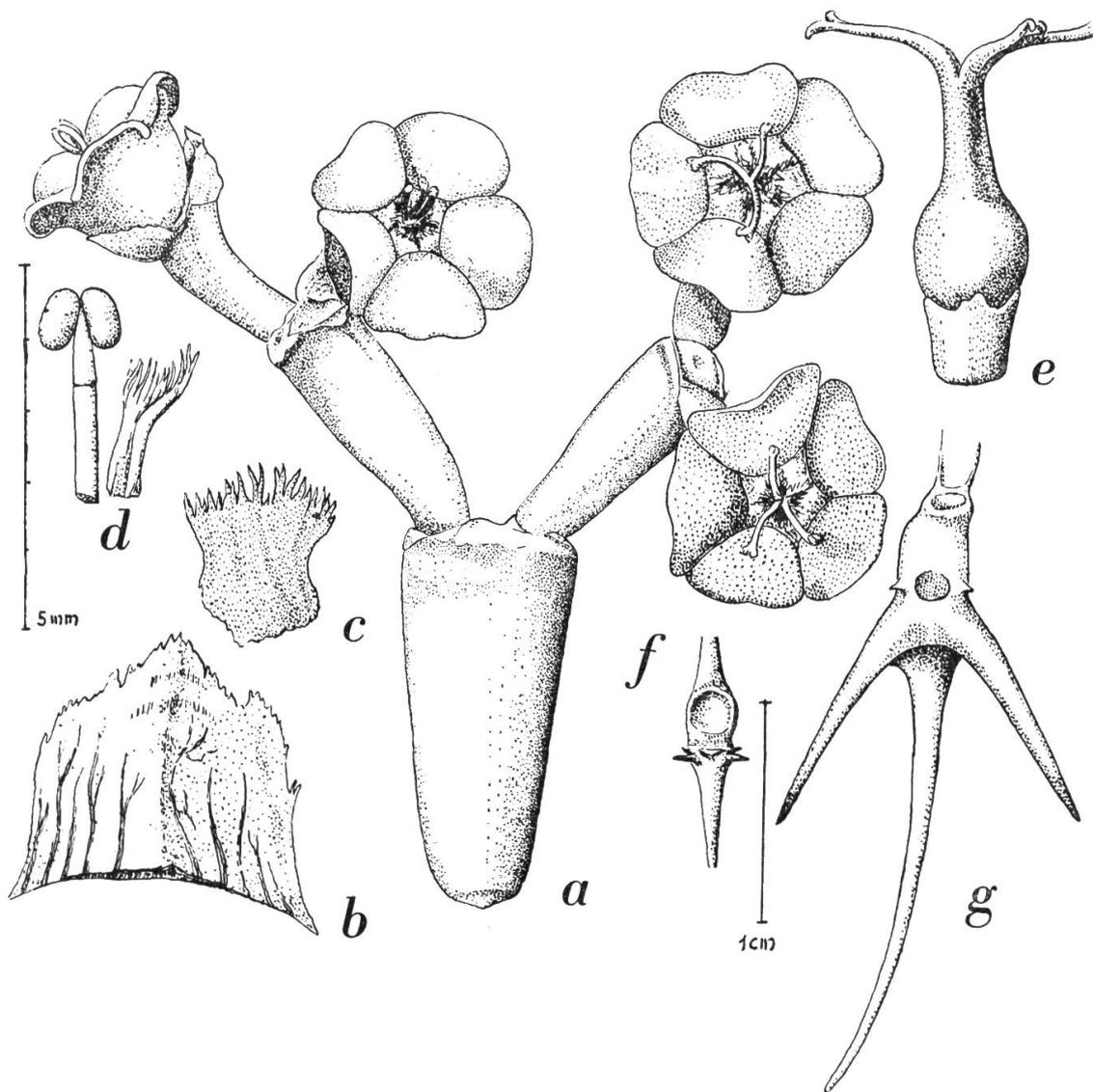
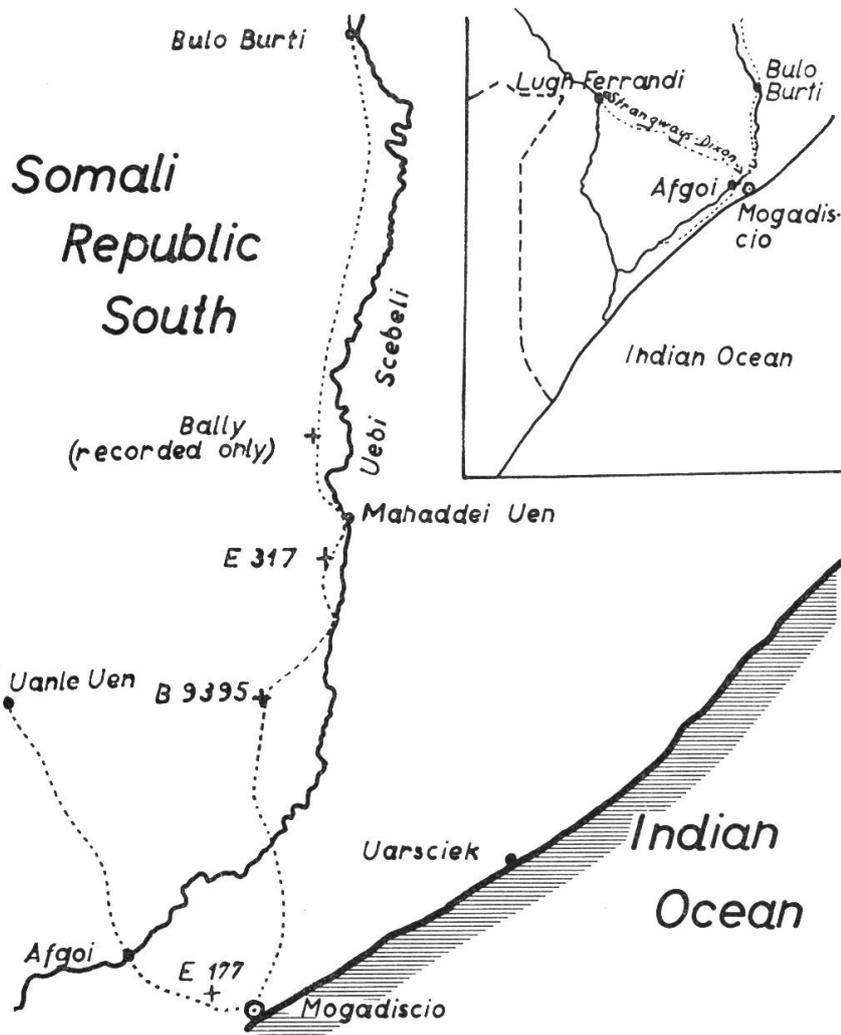


FIG. 5. — *Euphorbia carteriana* Bally spec. nov.

a, cyme – b, involucre bract – c, lobe – d, male flower and bracteole – e, ovary and pistil – f, g, spine-shields. From Bally E 307.

Abruzzi, 130 m on red, sandy soil with *Euphorbia robecchii*, *E. grandicornis*, *Aloe trichosantha*, *Adenia globosa*, *Adenium somalense*, *Acacia* spp., *Boscia*, *Edithcolea grandis*, 2°53' N, 45°30' E, flowering in January, Jan. 1954, Bally B 9539 (K holo, G,EAH). Observed as far as 25 miles North of Villagio Duca degli Abruzzi.

Somali name: "kabibi". The fiber of *E. carteriana* (and also of *E. grandicornis* and *E. longispina*) is used by the Somali women for making their wickerwork milk containers. The ever increasing inroads on the formerly considerable stands threaten to exterminate this interesting species which is limited to a comparatively small area. Only 10 years after the writer's first visit to the region the plant had disappeared from the neighbourhood of Mogadiscio, and further North only a few isolated plants

FIG. 6 — Distribution of *Euphorbia carteriana*.

were observed. The absence of seedlings or young plants indicated that little or no regeneration is taking place under present conditions.

The species is named after Miss Susan Carter of the Kew Herbarium, for many years the writer's collaborator on the East African Euphorbieae.

18. *Euphorbia columnaris*

Euphorbia columnaris Bally spec. nov.

In sectionem pertinat *Diacanthium* Boiss. sed affinitas propinqua haud manifesta; a ceteris speciebus cymis numerosis supra scutellum congregatis, caule solitario haud ramoso differt.

Planta succulenta, radicibus paucis, tenuibus, fibrosis. *Caulis* solitarius, erectus, columnaris, haud ramosus, 13-16-angulatus, usque 1.3 m altus, usque 8 cm crassus, inter angulos profunde sulcatus. Anguli vix dentati, scutellis bispinosis triangularibus decurrentibus,

saepe marginem continuum formantibus, praediti. Scutella pallide fulva, 12-14 mm longa, 4-6 mm lata, 1-2.5 mm alta, spinis binis robustis saepe breviter pedunculatis, curvato-divergentibus, 11-18 mm longis, in basi 1.5 mm crassis instructi. *Folia* squamosa, 1.5 mm longa, caduca, in apice spinarum pedunculorum orta. *Cymae* supra-axillares, 24-30, dense congregatae, aliae post alias ortae, nonnunquam in parte decurrente scutellorum inclusae. Pedunculi 3-7 mm longi, 1.2 mm crassi; involucri bractee triangulares 1.2 mm longae, in basi 1 mm latae, oppositae, carinatae, subcarnosae, in margine superiore fimbriatae. *Involucrum* primum praecox, involucris binis lateralibus serius editis. Involucra lateralia breviter pedunculata (pedunculo usque 1 mm longo), 1.5 mm longa, superne 3 mm lata, omnino glabra. Glandulae reniformes, 1.5-1.6 mm latae, 0.8 mm longae, in margine integrae; lobi subrotundi, profunde laciniati, 1 mm longi, 1.2 mm lati, erecti, membranacei. *Flores masculi*: pedicellus glaber, 2 mm longus; filamentum glabrum, 1 mm longum; antherarum thecae 0.5 mm longae, 0.25 mm diam. *Flos femineus*: pedicellus exsertus, reflexus, usque 4 mm longus; lobi perianthii minuti, obtuse deltoidei, in margine crenulati. *Capsula* subglobosa, 3-sulcata, 2 mm longa, 2.3 mm diametro, glabra, viridis. Styli 3, usque ad basin divisi, 1.2 mm longi, in apice breviter bilobati, incrassati, rugulosi. Semen haud visum.

Succulent plant, with few thin, fibrous roots. Stem solitary, erect, columnar, unbranched, 13-16 angled, to 1.3 m high, to 8 cm thick, deeply grooved between the angles. Angles somewhat dentate, beset with decurrent triangular spineshields, often forming a continuous margin. Spineshields pale yellow, 12-14 mm long, 4-6 mm wide, 1-2.5 mm high; spines paired, robust, often shortly united at the base, curving outwards, 11-18 mm long, 1.5 mm thick at the base. Leaf-scar situated at the juncture of the spines; leaves scale-like, acute, 1.5 mm long, caducous. Flowering eyes above the leaf-axils, each consisting of 24-30 densely clustered cyme-buds which develop in successive groups of 5-6, eyes sometimes included in the decurrent part of the shield above. Peduncles 3-7 mm long, 1.2 mm thick; involucre bracts 1.2 mm long, 1 mm wide, opposite, keeled, subfleshy, upper margin fimbriate. Primary involucre precocious, followed by two bisexual lateral involucre. Lateral involucre shortly pedunculate (peduncle to 1 mm long) 1.5 mm long, 3 mm wide above, glabrous in all parts. Glands reniform, 1.5-1.6 mm wide, 0.8 mm long, margin entire, lobes subrotund, deeply lacinate, 1 mm long, 1.2 mm wide, erect, membranous. Staminate flowers: pedicel glabrous, 2 mm long, filament glabrous, 1 mm long, anther-cells paired 0.5 mm long, 0.25 mm wide. Pistillate flower: pedicel exserted and reflexed, to 4 mm long, perianth lobes minute, obtusely deltoid, margin crenulate. Capsule subglobose, 3-lobed, 2 mm long 2.3 mm diam., glabrous, green. Styles 3, free to the base, 2 mm long, shortly bifid and with rugulose thickened tips. Seeds not seen.

Distribution. SOMALI REPUBLIC, NORTH; endemic in hills near Las Anod, small hill 1 mile East of Las Anod township, on gypsum, *E.F. Peck* in Herb. *Bally E 164*; *ibid.*, in crevices of gypsum rock with *Aloe inermis*, *Jatropha nogalensis*, *Cleome droserifolia*, *Negripteris scioana*, *Adenia aculeata*, *Launaea* sp., *Commiphora* spp., 8°26' N. 47°21' E, 800 m alt., average rainfall 12 cm, 17.10.1957, *Bally 10423* (holo K, isotypes EAH, G); *ibid.*, under (10423) living specimens distributed to Kew, Zürich, Berkeley (Calif.), also habitat photographs, 27.9.1956, 17.10.1957; 20 miles East of Las Anod, in gypsum hills (near Bok Har) on slopes with *Jatropha* etc., 720 m, 8°25' N, 47°38' E, unbranched spiny plant to 80 cm high, 16 ribs, 7.11.1960, *C. Hemming 2087* (K).

The characters which distinguish this rare and remarkable plant from other species in the Section *Diacanthium* are the solitary unbranched stem and the inflorescence in which each flowering eye produces up to thirty minute once-forked cymes, a multiple of the number developed by any other *Euphorbia*. It is restricted

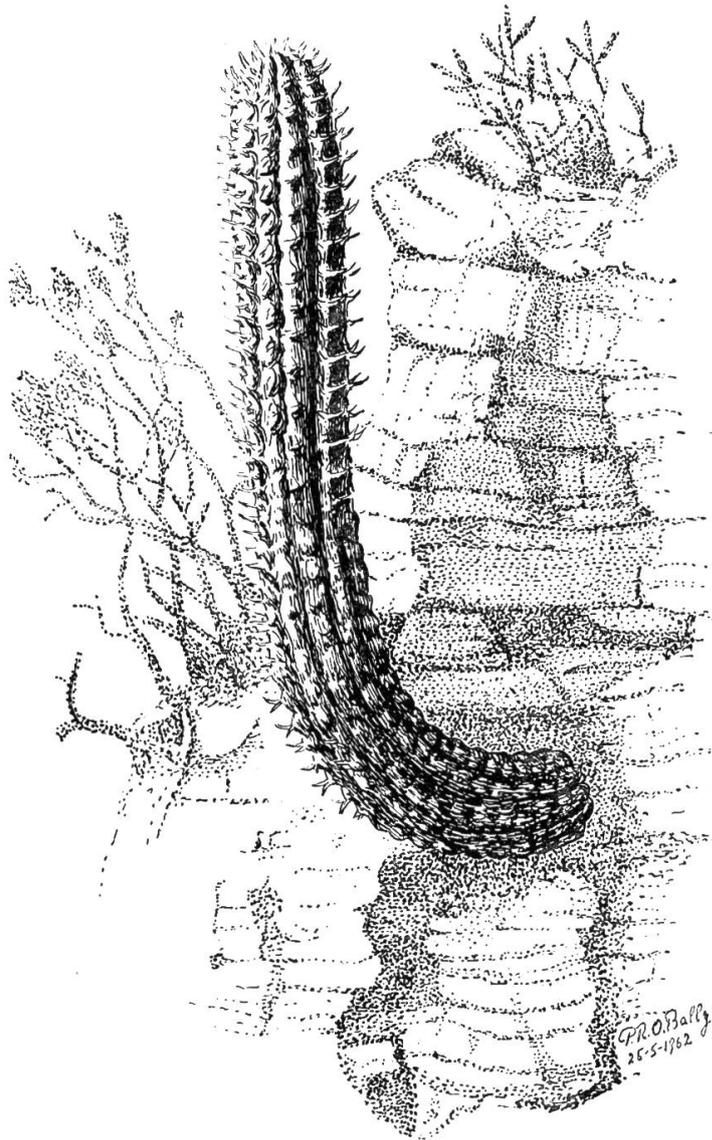


FIG. 7. — *Euphorbia columnaris*, habitus.

today to a few hills in the vicinity of Las Anod and it is to be feared that before long it will die out; the writer observed an alarming decrease in numbers among the few scattered populations after every consecutive visit to Las Anod. The causes for this rapid decrease must be sought in the heavy overgrazing to which this arid region is continually exposed. It has disastrous effects on the soil which is destroyed and carried away by wind-erosion wherever the herbaceous cover has gone; the weak fibrous roots of the plant become inadequate to hold the top-heavy columnar stems in position; they fall over and — with their unprotected sides exposed to the full force of the sun, they perish quickly. Only in the cracks and fissures of the gypsum cliffs, where their roots get a firm anchorage can the plants survive.

Regeneration from seed is diminishing from similar causes: the tender seedlings are either eaten or trampled underfoot wherever the ubiquitous sheep or goats will venture.

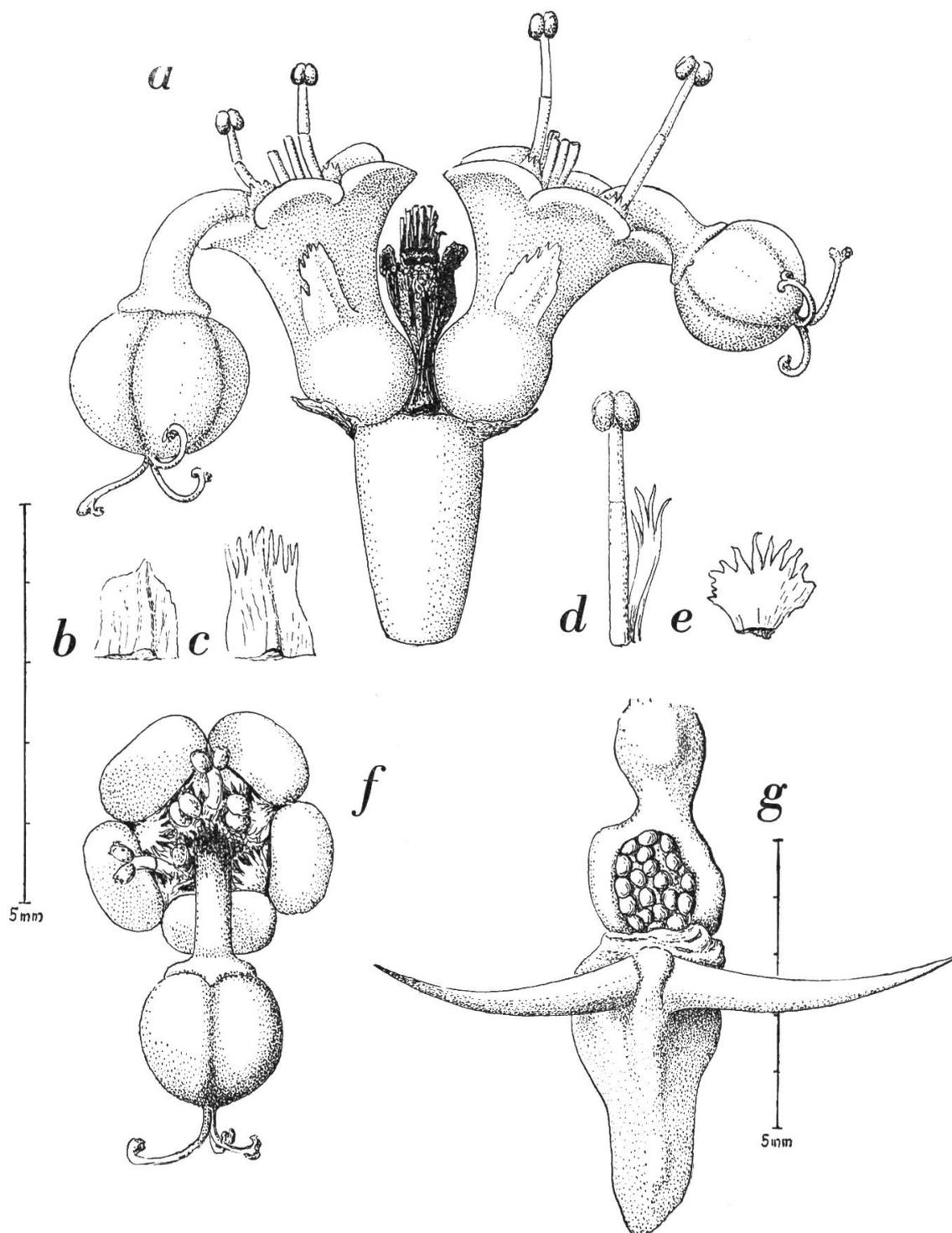


FIG. 8. — *Euphorbia columnaris* Bally spec. nov.
a, cyme — *b*, *c*, involucre bracts — *d*, male flower with bracteole — *e*, lobe — *f*, involucre showing pedicellate capsule — *g*, spine-shield with flowering eye.

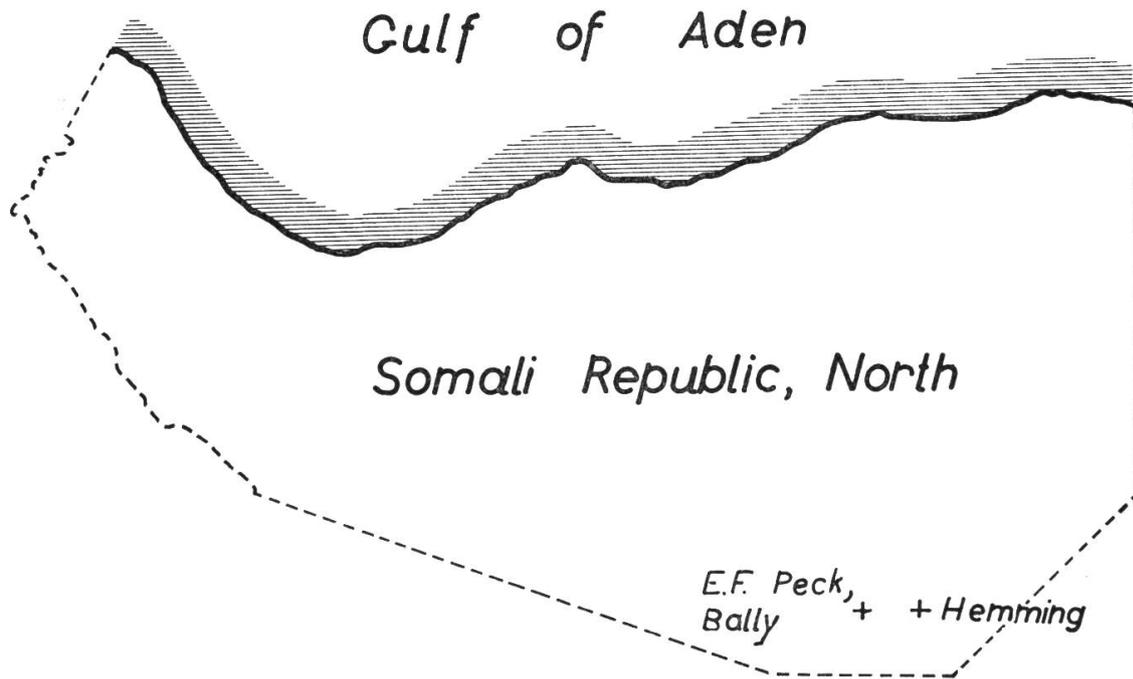


FIG. 9. — Distribution of *Euphorbia columnaris*

19. *Euphorbia inculta*

Euphorbia inculta Bally spec. nov.

Affinis *E. nigrispinae* N.E.Br., sed habitu robustiore, laxius et brevius ramosa, spinis solidioribus, capsulis longe pedicellatis exsertis differt.

Frutex carnosus spinosus, usque 2.3 m altus. *Caules* pauci, sparse ramosi, obtusi, 4-5-angulares, angulis \pm dentatis; rami irregulariter patentes, 2-3 cm crassi. *Scutella* in angulos disposita, 5-13 mm longa, 2-3 mm lata, 3-8 mm decurrentia, saepe contigua, in parte superiore cymas includentia, spinis binis divergentibus usque 15 mm longis, in basi 2 mm crassis coronata; aculei desunt. *Folia* caduca, haud visa. *Cymae* in apicibus ramorum congregatae, axillares, solitariae, 1-2-furcatae; pedunculus 1.5-2 mm longus, 3.5 mm crassus, carnosus. *Involucrum* primum praecox, late infundibuliforme, 2.5 mm longum, cum glandulis 5 mm latum; cymae rami 1.5-2 mm longi, 2 mm crassi; involucri secundaria 2.5-4 mm longa, cum glandulis 5 mm lata. Involucri bracteae squamosae, carinatae, serrulatae, persistentes, 1.2 mm longae, 2-2.5 mm latae. Glandulae patentes, rhomboideae, 0.8-1.5 mm longae, 2.3 mm latae, glabrae, connatae, marginem continuum, leviter 5-incisum efformantes. Lobi erecti, membranacei, rotundi, glabri, fimbriati, 1.5×1.5 mm. *Flores masculi*: pedicelli 3 mm longi; filamenta 0.5 mm longa, glabra; antherarum thecae 0.75 mm latae; bracteolae membranaceae, laciniatae, 2-3 mm longae. *Flos femineus*: pedicellus exsertus, glaber, usque ad 8 mm longus, reflexus; perianthium ad lobos 3 obtusos redactum; ovarium obtuse trilobatum, glabrum; styli 3, in basi breviter connati, 2 mm longi, patentes, in apice incrassati, rugulosi. *Capsula* et semina haud visa.

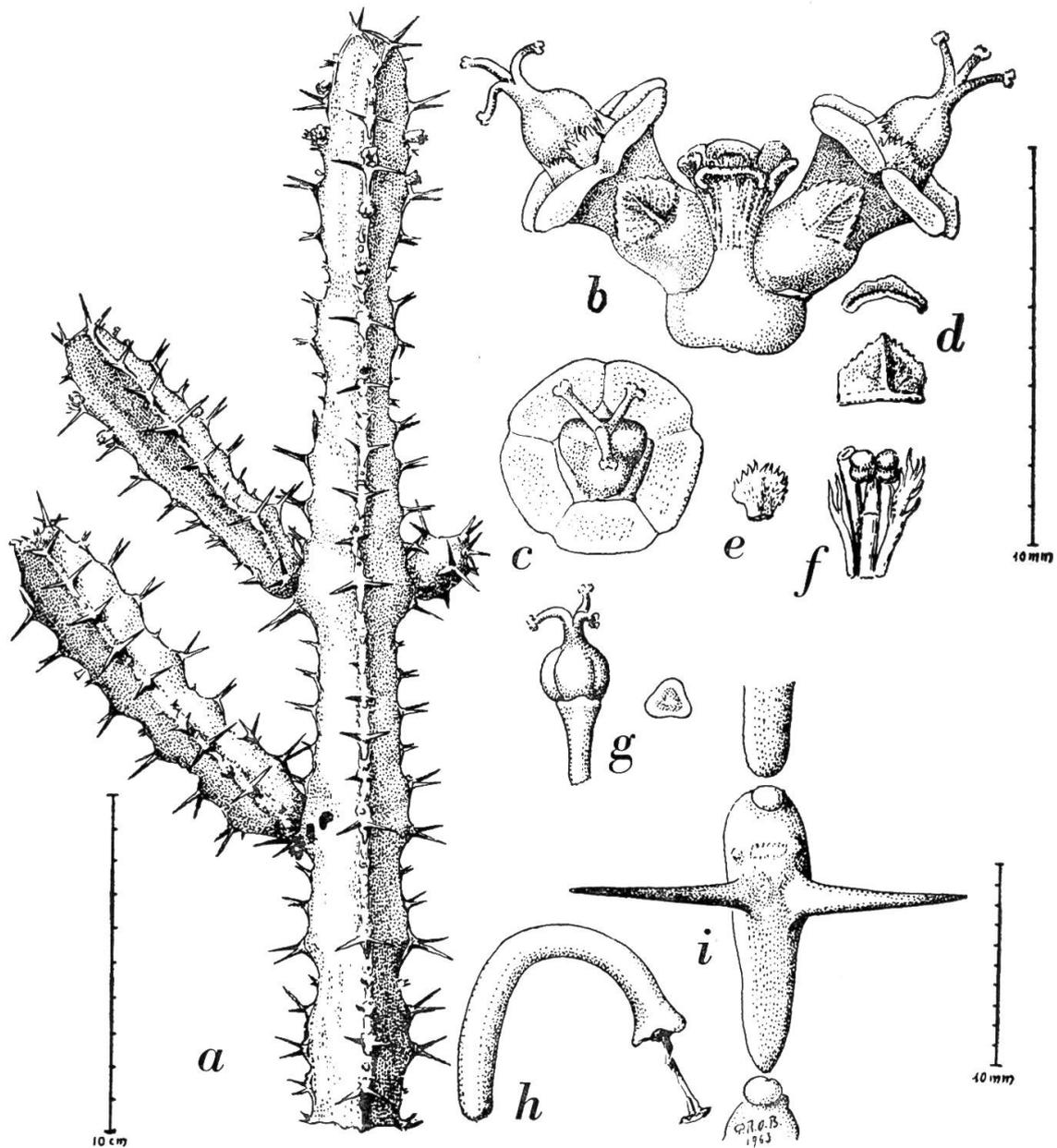


FIG. 10. — *Euphorbia inculta* Bally spec. nov.

a, branch — *b*, cyme — *c*, involucre — *d*, involucral bract — *e*, lobe — *f*, male flower and bracteole — *g*, pedicellate ovary and three-lobed calyx — *h*, reflexed pedicel — *i*, spine-shield.

Stout 4-5 angled erect stem to 2.3 m high, 2-3 cm thick with irregular erect spreading, short branches. No or little secondary branching; green parts glaucous. Spines paired (prickles absent) divergent to 15 mm long, 2 mm thick at base, 6-10 mm distant. Spine-shield fairly irregular in length below flowering eye, above including eye, rarely contiguous, 3 mm wide, dark reddish-brown, almost black, turning grey with age. Cymes disposed on terminal

branches, solitary, once or twice forked, with 1 precocious central ♂ involucre, 2 or more lateral ♀ involucre. Peduncle stout, 1.5-2 mm long, 3.5 mm thick. Involucral bracts scale-like, triangular, keeled, margins serrulate, 1-2 mm long, 2-2.5 mm wide. Lateral cyathia pedunculate, peduncles 1.5-2 mm long, 2 mm thick; 4 mm long, 5 mm wide including glands, funnel-shaped. Glands horizontally spreading, contiguous, rectangular, approx. 2.5 mm wide, 1.5 mm long, glabrous, margins entire. Lobes 5, erect, rounded, margin fimbriate, 1.5×1.5 mm. Male flowers :- pedicel 3 mm long; filament 0.5 mm long, anther cells 0.75 mm across, bracteoles up to 2 mm long, membranous, laciniate. Female flowers :- pedicel elongating to 8 mm in fruit; perianth reduced to 3 obtuse lobes, glabrous, ovary obtusely 3-angled, glabrous, styles 3, style-arms 2 mm long, spreading, with thickened rugulose tips, shortly united at the base. Capsule and seed not seen.

Distribution. SOMALI REPUBLIC: Afard, 600 m, $10^{\circ}10' N$, $44^{\circ}8' E$, 27.10.1932, *Gillett 4480*; Bihendulla, 300-400 m, $10^{\circ}13' N$, $45^{\circ}6' E$, 28.5.1949, *Bally 7223*; Mt. Busta (Busteh), $10^{\circ}19' N$, $45^{\circ}3' E$, 28.5.1949, *Bally 7127*, photo only; near Behindulla, 300-700 m, $10^{\circ}13' N$, $45^{\circ}6' E$, *Bally 16.11.1954*; Erigavo-Mait road, 630 m, $10^{\circ}52' N$, $47^{\circ}18' E$, 4.11.1954, *Bally 10330*; Behindulla, 650 m, 18.1.1944, *Bally E 264* (Type K).

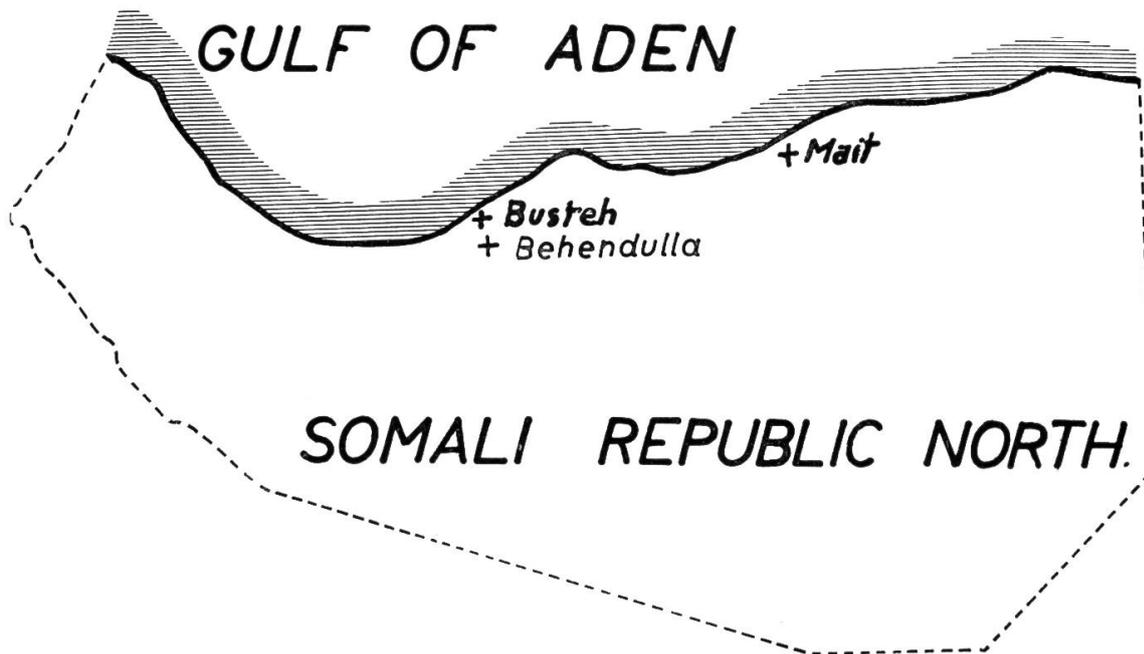


FIG. 11. — Distribution of *Euphorbia inculta*.

Related to *E. nigrispina* but sturdier growth, more sparsely branched, heavier spinescence, cymes often 2-forked, capsule exerted on a long pedicel.

20. *Euphorbia multiclava*

Euphorbia multiclava Bally & Carter spec. nov.

Affinis *E. phillipsiae*, sed ramis crassioribus bifurcatis magis sulcatis, scutellis prominentibus distinguitur.

Planta valde succulenta, ponderosa, multiramosa, usque 20 cm alta, 40 cm diametro. Radix fibrosa, 15-20 cm longa. *Caulis* solitarius, in basi immersus, 6-12 cm longus, 2-3 cm crassus, 10-15-sulcatus. Rami 2-7 cm longi, 1-2.5 cm crassi, bifurcati, usque 16-sulcati, tuberculati, tuberculis 1-2 mm altis, contiguus, scutellis bispinosis obsitis. *Scutella* ovata, usque 5 mm longa et 3 mm lata, mammillaria, spinis binis vix recurvatis 0.5-5 mm longis praedita. Folia minutissima, squamosa, mox decidua. Bractee involucrales subrotundae, 1.2 mm longae et latae, in margine superne denticulatae. *Cymae* apicales, sessiles, ex involucri unico masculino et involucris pluribus bisexualibus lateralibus consistentes. *Involucrum* primum 3 mm diam., 3 mm altum (lobis erectis inclusis); glandulae 6, reniformes,

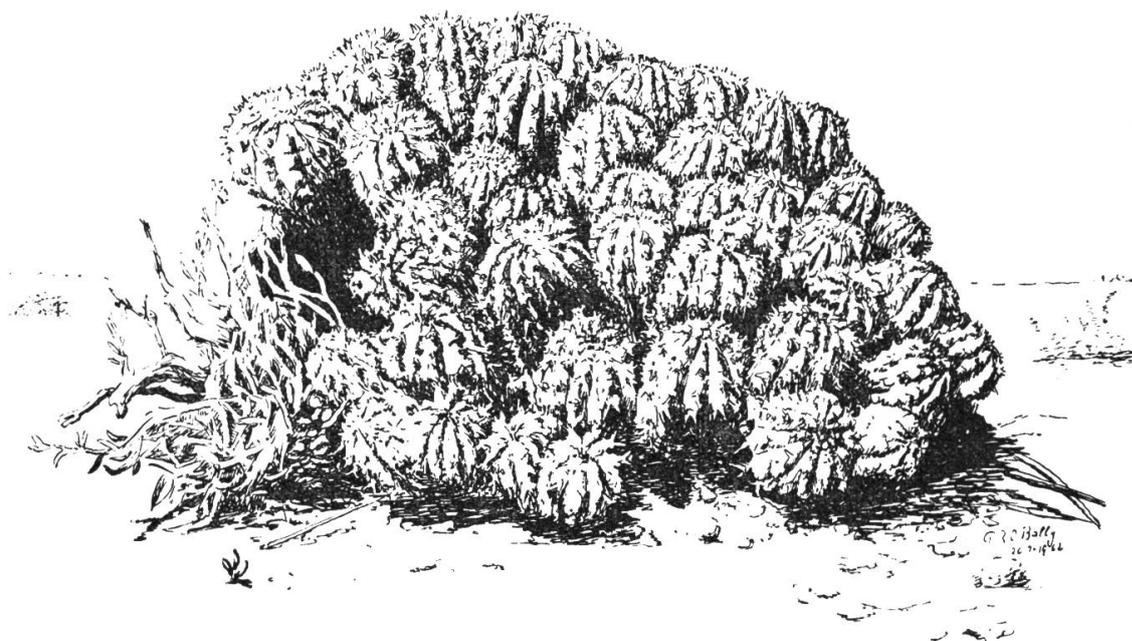


FIG. 12. — *Euphorbia multiclava*, habitus.

erectae, 1 mm longae, 1.2 mm latae, margine integro. Lobi transverse elliptici, 0.75 mm alti, in margine fimbriati, glabri. *Flores masculi*: pedicelli 2 mm longi; filamenta 1 mm longa; antherarum thecae, 0.5 mm longae; bracteolae profunde laciniatae, glabrae, 1.5 mm longae. *Flores feminei*: ovarium pedicellatum, erectum, profunde trilobatum; pedicellus 1.5 mm longus, carnosus, in apice incrassatus; perianthium obtuse trilobum. *Capsula* profunde 3-loba, 2.5 mm longa, 2.8 mm lata. Styli in basi breviter connati 1 mm longi, in apice incrassati, haud bilobati.

A short, thick-branched, very fleshy spiny plant to 20 cm high, 40 cm diam. Root fibrous, weak, main root 15-20 cm long. Stem solitary, buried at the base, 6-12 cm long,

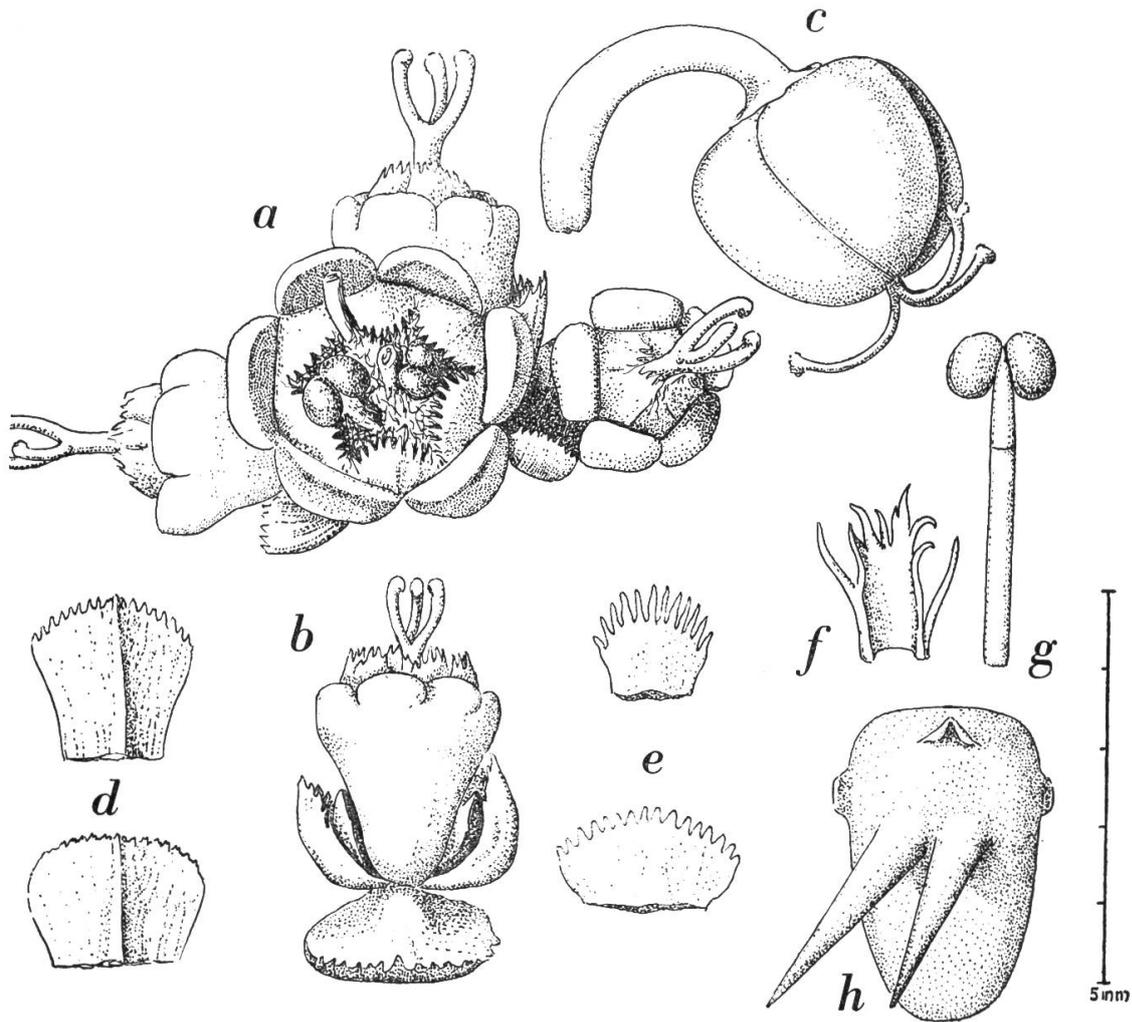


FIG. 13. — *Euphorbia multiclava* Bally & Carter spec. nov.

a, cyme — *b*, involucre — *c*, capsule — *d*, involucral bracts — *e*, lobes — *f*, bracteole — *g*, male flower — *h*, spine-shield.

2-3 cm thick, 10-16 angled. Branches club-shaped, 2-7 cm long, 1-2.5 cm thick, shortly and dichotomously branched; branches up to 16-angled, tuberculate, tubercles 1-2 mm high, contiguous, crowned by double-spined shields. Spine-shields ovate, to 5 mm long, and 3 mm wide, prominent, spines short, straight or scarcely recurved, 0.5-5 mm long. Leaves very minute, scale-like, soon deciduous. Involucral bracts subrotund, 1.2 mm long and wide, margin denticulate. Cymes produced axillary from the apices of the branches, sessile, consisting of a solitary male involucre, and 2 or more bisexual lateral involucre. Primary involucre 3 mm high and 3-3.5 mm diam., including the erect lobes; glands 6, reniform, erect, 1 mm long, 1.2 mm wide, margin entire. Lobes transversely elliptic, 0.75 mm long, 1-1.75 mm wide, glabrous, margin fimbriate. Staminate flowers: pedicel 2-3 mm long, filament 1 mm long, anther-cells 0.5 mm long; bracteoles deeply lacinate, glabrous, 1.5 mm long. Pistillate flowers: pedicel 1.5 mm long, fleshy, thickened at the apex; perianth reduced to 3 obtuse lobes; capsule deeply 3-lobed, 2.5 mm long, 2.8 mm wide; styles shortly connate at the base, 1 mm long, with thickened entire tips. Seed not seen.

Distribution. SOMALI REPUBLIC: foot of escarpment, 20 ml. E. of Erigavo, 10°38' N, 47°39' E, Feb. 1954, *J.G. Williams* in *Bally 9694* (Syn. K); Shemis Plain, 60-65 ml. E of Erigavo, 10°20' N, 48°10' E, 20.10.1956, *Bally 1187*; Erigavo township, 10°37' N, 47°22', E. *F. Peck* [1943] in herb. *Bally E 204* (spirit only); *ibid.*, 9.8.1945, *P. E. Glover*; Iman Gerad plains, 20 ml. E of Erigavo, 10°38' N, 47°39' E, 5.11.1954, *Bally 10341*; 7 ml. E of Hadaftino, 1900 m, 10°44' N, 48°13' E, 30.9.1960, *Hemming 1986*; 10 miles S-E of Erigavo, 1700 m, overgrazed gypsum plain, compact spinescent plantlet, 23 cm high, *Hemming 2012*.

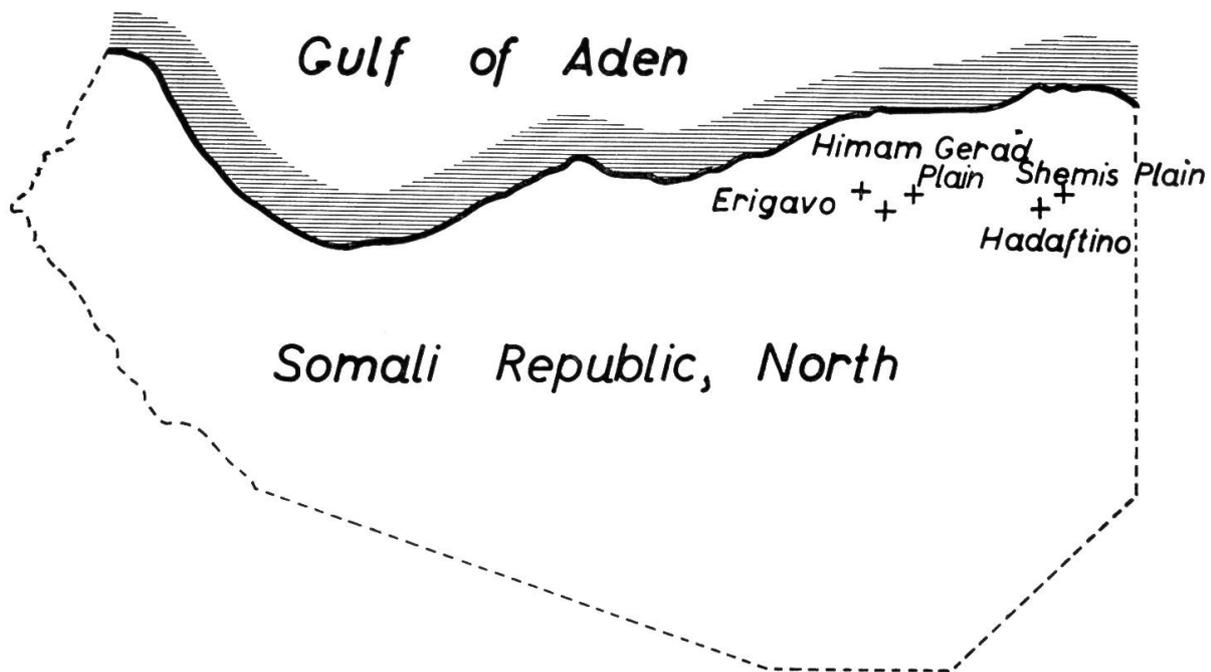


FIG. 14. — Distribution of *Euphorbia multiclava*.

21. *Euphorbia tanaensis*

Euphorbia tanaensis Bally spec. nov.

Arbor 12-18 m alta, succulenta, spinosa, trunco eramoso 10-16 m longo basi usque ad 40 cm diam.; rami in parte trunci inferiore decidui, in apice dense verticillati, sparse et breviter ramulosi, usque 270 cm longi, inferiores patenti-reflexi, superiores erecti, 5-6-angulati, alati, segmentati, segmentis circiter 35 cm longis, angulis valde compressis, margine acutis, inter podarios 2-3.5 cm distantes tenuiter lobatis. *Podarii* elliptici vel orbiculati, haud decurrentes, 3-4 mm longi et lati, folium includentes, subtus bispinosi, spinis binis tenuibus divergentibus instructi. *Folia* in apice ramorum et ramulorum sita, percrassa, obovata, apice acuta, basi subcordata, in specimine viso, 8-12 mm longa, 4-6 mm lata, verisimiliter etiam majora. *Cymae* 1-3, proxime supra podarium sitae, nonnunquam in eo inclusae, erectae, longe pedunculatae, bifurcate, omnino rubrae. *Pedunculus* bibracteatus, teres,

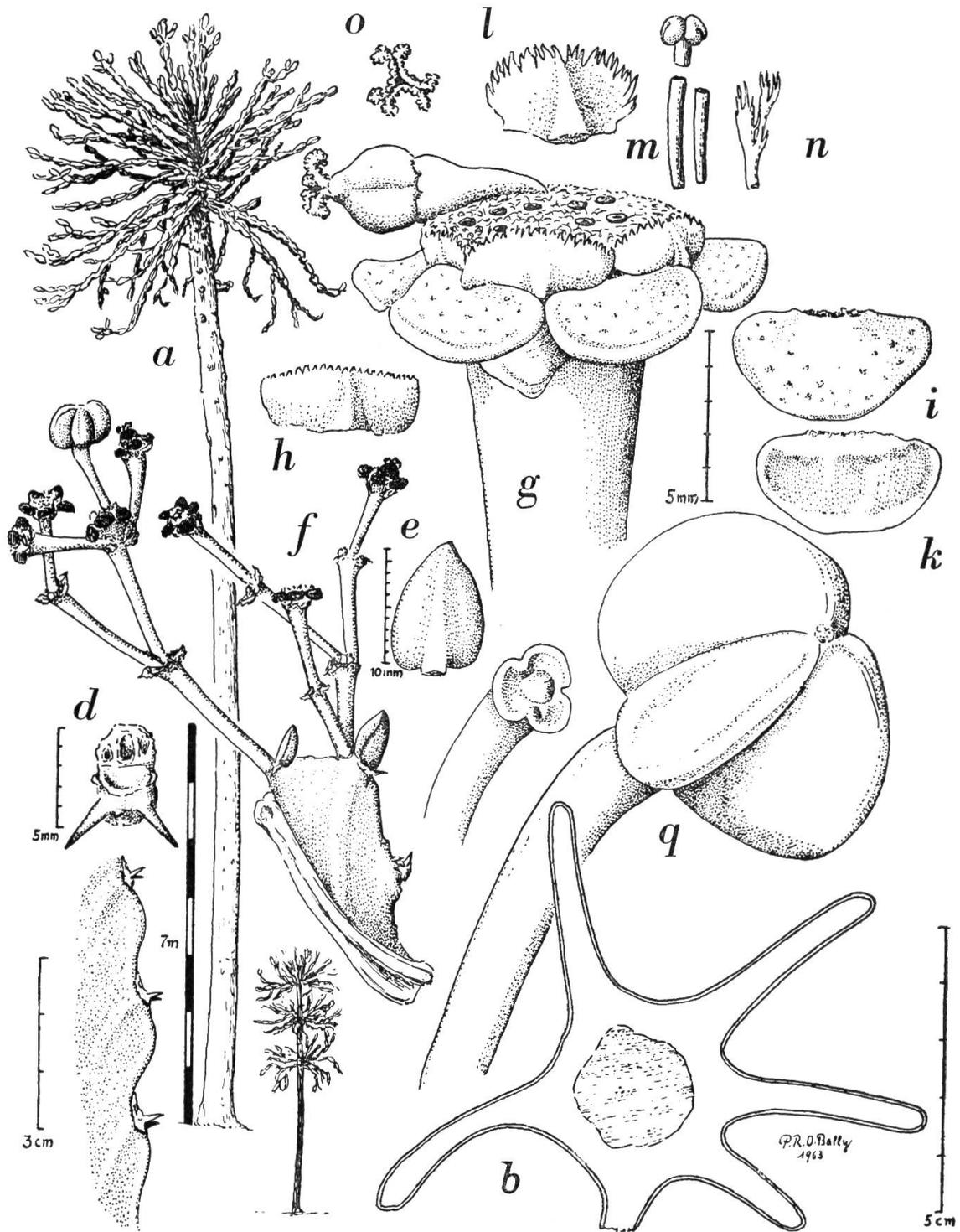


FIG. 15. — *Euphorbia tanaensis* Bally spec. nov.

a, mature tree — *b*, primary branch, cross section — *c*, margin with spine-shields — *d*, spine-shield — *e*, leaf — *f*, cymes — *g*, involucre — *h*, involucrel bract — *i*, gland, upper surface — *k*, gland underside — *l*, lobe — *m*, anther (filament, pedicel, cells) — *n*, bracteole — *o*, pistil — *p*, perianth (reduced to three lobes) — *q*, capsule.

18-26 mm longus, usque 4 mm crassus; cymae rami primarii 14-20 mm, secundarii 10-12 mm longi. *Involucri* bracteae minutae, coriaceae, late ellipticae, 2.5 mm longae, 5 mm latae, brunneoflavae, persistentes, margine minute denticulatae. Involucrum cupulare, 2-3 mm longum, glandulis exclusis 3 mm diametro, lobis 5 vel 6 erectis subcarnosis glabris late ellipticis 2.5 mm longis 4 mm latis margine breviter laciniatis, glandulis 5 in specimine viso aut 6 carnosis, transverse ellipticis vel reniformibus 3 mm longis 5.5 mm latis e margine involucris horizontaliter patentibus munitum. *Flores staminei* numerosi: pedicellus 2-2.5 mm longus, glaber, teres; filamentum 0.75 mm longum; antherae thecae binae, 0.75 mm longae, 0.5 mm diam.; bracteolae numerosae, membranaceae, laciniatae, usque 3 mm longae. *Flos femineus* unicus, pedicellatus; pedicellus exsertus, teres, recurvatus, usque 14 mm longus; perianthium ad lobos 3 auriculatos redactum; capsula profunde trilobata, circiter 0.6 mm longa, 10 mm diam., lobis lateraliter compressis, marginibus subacutis; styli 3, e basi liberi, patento-reflexi, carnosus, rugulosi, apice bifidi incrassati. *Semina* haud visa.

A succulent tree to 18 m high; bole cylindrical, to 40 cm diam., 16 m high, crown 1.80 m high; branches verticillate, to 2.70 m long, spreading-ascending, 5-6-angled, winged, constricted at intervals of about 35 cm, wings to 3 cm wide, central portion small; margins

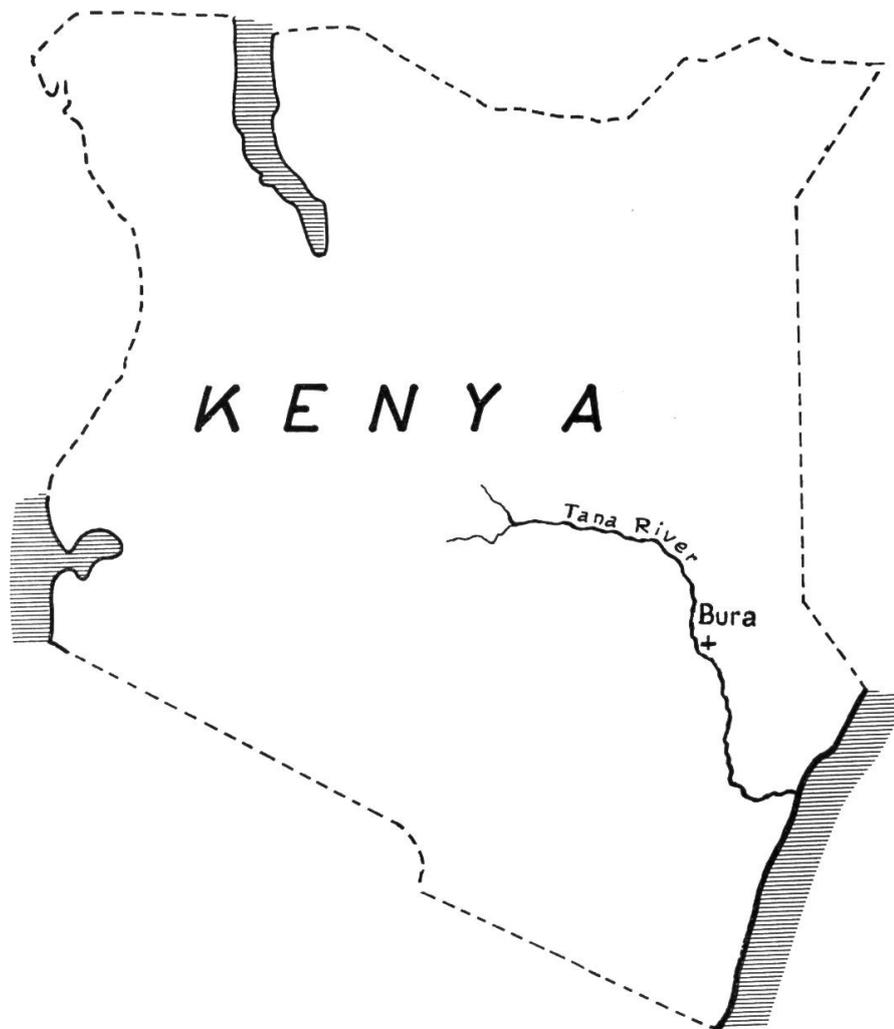


FIG. 16. — Distribution of *Euphorbia tanaensis*

shallowly undulate with spineshields 2-3.5 cm distant. Shields orbicular to elliptic, not decurrent, 3-4 mm long and broad, including the leaf scar, with 2 weak divergent spines, 3-4 mm long in their lower half, light reddish brown, turning grey with age. Leaves produced on the terminal segments, very fleshy, elliptic, acute, cordate at the base, 8-12 mm long, 4-6 mm wide, possibly larger in the vegetative stage. Flowering eyes 1-3, immediately above the leaf scar, sometimes included in the shield. Inflorescence twice forked, pedunculate, peduncle 18-26 mm long, to 4 mm thick, terete, fleshy; primary cyme branches 14-20 mm, secondary 10-12 mm long. Involucral bracts small, coriaceous, broadly elliptic, 2.5 mm high, 5 mm wide, yellowbrown, persistent, margin minutely toothed. Involucre shallowly cupular, 2-3 mm high, about 3 mm diam.; lobes 5 or 6² erect, fleshy, transversally elliptic, 2.5 mm high, 4 mm wide, margin laciniate. Glands 5 or 6, horizontally spreading, fleshy, transversally elliptic to reniform, 3 mm long, 5.5 mm wide. Staminate flowers very numerous; pedicel 2-2.5 mm long, filament 0.75 mm long, anther-cells 2, 0.75 mm long, 0.5 mm diam; bracteoles numerous, thinly membranous, strap-shaped or divided, laciniate, to 3 mm long. Pistillate fls. exerted, pedicel 14 mm long or more; perianth reduced to a 3-lobed calyx 2-3 mm diam., with entire, auriculate lobes. Capsule deeply 3-lobed, about 0.6 mm high, 10 mm diam., possibly more (mature capsule not seen). Styles free to the base, reflexed-spreading, fleshy, rugulose, channelled above, 0.7 mm long, with thickened, bifid tips. Seeds not seen. Inflorescence and capsule crimson in all parts.

Distribution. KENYA: Coast Prov., Tanaland, Mambosasa on road from Garsen to Bura, 15 miles S of Bura, 1°46' S, 40°07' E, very local and scattered in Terminalia hildebrandtii, Combretum schumannii, Gyrocarpus, Antiaris, Chlorophora, Afzelia quanzensis, Erythrophloeum guineense, Ficus spp., Manilkara semi-deciduous swamp forest (sometimes the branches are produced in up to 3 crowns one above the other), 7.11.1957, P.J. Greenway 9473.

22. *Senecio picticaulis* (Compositae)

Senecio picticaulis Bally spec. nov.

Affinis *Senecioni pendulo* (Forsk.) Sch. Bip. sed radice tuberosa, caule erecto subcylindrico annuo, cicatricibus foliorum prominentioribus, foliis crassis, multo longioribus, acheniis rigide setulosis differt.

Herba succulenta glabra, 15-35 cm alta. *Radix* tuberosa, horizontaliter disposita. *Caulis* singulus, erectus, raro ramosus, annuus, carnosus, cylindricus, saepe subclavatus, 8-20 cm altus, in basi 0.5 cm, supra usque 2 cm crassus, pallide viridis, sub cicatricibus foliorum lineis 3, fuscoviridibus decurrentibus, patentibus pictus. *Podaria* foliorum vix prominentia. *Folia* subulata, patento-ascendentia, usque 5.5 cm longa, 3 mm crassa, sessilia, in apice acuta, decidua, ex apice basin versus rugantia. *Pedunculus* terminalis, solitarius, 10-20 cm aut longior, 2 mm crassus, infra capitulum usque 5 mm incrassatus, cylindricus, pallide viridis, longitudinaliter striatus, bracteis 6-8, spiraliter dispositis, linearis, 6-8 mm longis instructus. Calyx cylindricus, 2.3 cm longus, 0.8 cm diam.; involucri bractee 8-9, subcarnosae, lanceolatae, acutae, 3-3.3 mm latae, 3-4 nervatae, in margine uno scariosae, in apice acutae. *Flosculi* 48-50, rubentes, tubulosi, 25-28 mm longi, supra abrupte

² Out of sixteen cyathia examined, eight were 5-merous, eight 6-merous.

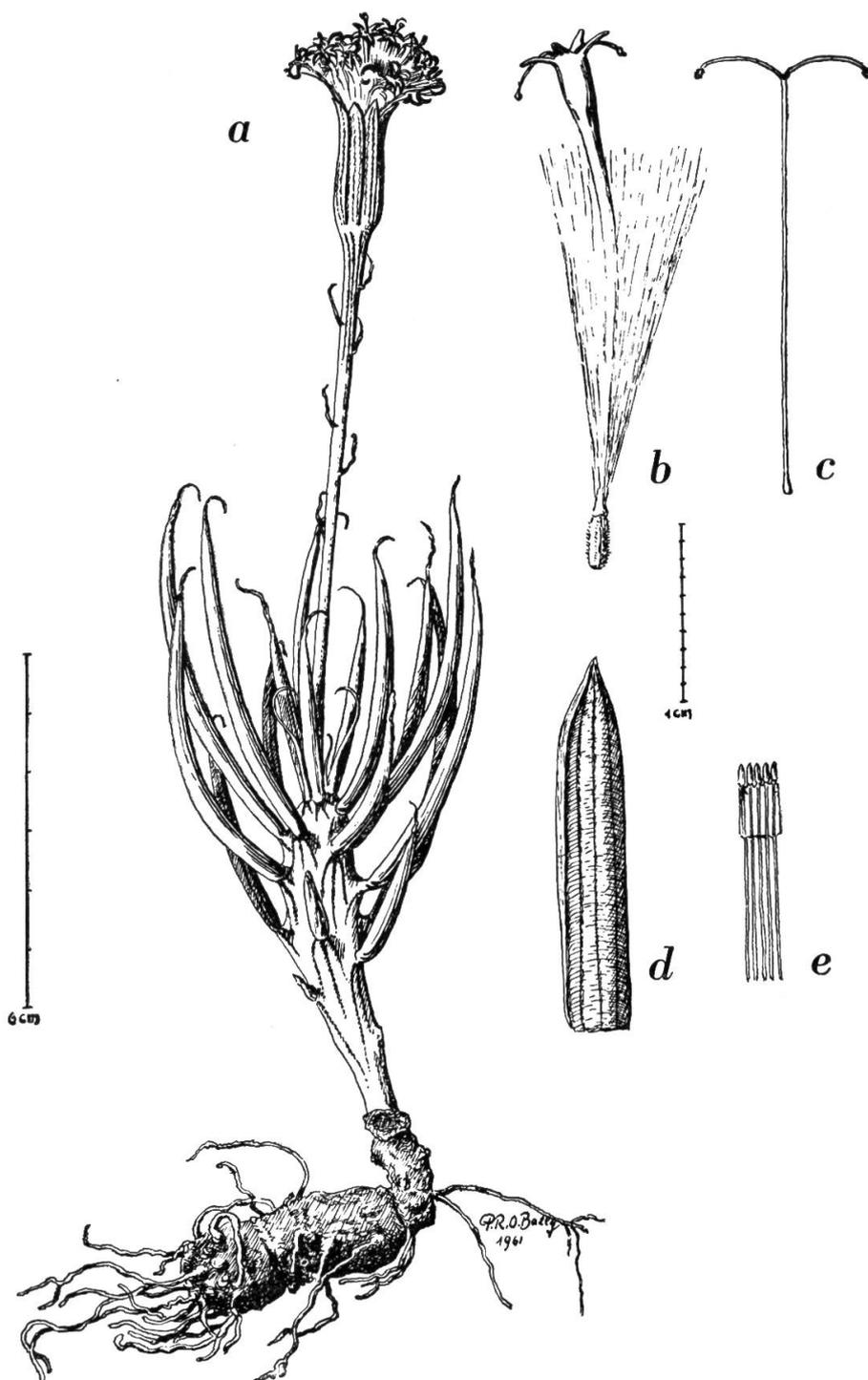


FIG. 17. — *Senecio picticaulis* Bally spec. nov.
a, flowering, rooted plant — *b*, floret with pappus and achene — *c*, style — *d*, involucral bract —
e, anthers.

dilatati, lobis 5, anguste triangularibus, 2 mm longis. Styli tubum aequantes, ramis recurvatis, in apice incrassatis, setulosis, tubum superantibus. Pappus 20 mm longus, albescens. *Achenia* 3-8 mm longa, sulcata, setulosa.

A fleshy, glabrous herb 15-35 cm high with a tuberous, perennial root, extending horizontally; stem solitary, erect, occasionally branched, annual, fleshy, cylindrical or somewhat clavate 15-20 cm long, 0.5 cm diam. at the base, to 2 cm thick above, pale green with 3 dark green lines descending from each of the slightly raised, spirally arranged leaf scars. Leaves subulate, spreading-ascending, to 5.5 cm long, 3 mm thick, fleshy, green, sessile, acute, drying up from the apex downward. Peduncle erect, cylindrical, usually solitary, occasionally two, 10-20 or more cm long, 2 mm thick, widening to 5 cm diam. underneath the solitary capitulum, laxly beset with 6-8 spirally arranged, linear, persistent bracts, 6-8 mm long. Calyx cylindrical, 2.3 cm high, 0.8 cm diam.; involucral bracts 8-9, strap-shaped, acute, fleshy, longitudinally 3-4-veined, acute, with a scarious margin down one side. Florets 40-50, tubular, 25-28 mm long, somewhat abruptly inflated above; lobes 5, narrowly triangular, obtuse, 2 mm long, spreading. Tube pale pink, lobes bright red. Style: united part as long as the tube, style-branches exerted, recurved, 5 mm long, with thickened, setulose tips, red. Pappus 20 cm long, white, silky; achenes 3-8 mm long, sulcate, with setulose hairs.

Distribution. KENYA: Central Prov., Nanyuki District, Ngare Ndare River, upper course, near road from Timau to Isiolo, 1800 m alt., 0°13' N, 37°22' E (appr.), 1944, *Joy Adamson* in *Herb. Coryndon Museum 11611* (holo); Powys' Farm, Nanyuki District, 1500 m alt., Apr. 1943, *Joy Bally* in *Bally 2542*; Southern Prov., Kajiado Distr. near Laitokitok, 1200 m alt. (appr.), June 1954, *R. Hennings* in *Bally 9769*;



FIG. 18. — Distribution of *Senecio picticaulis*.

Ol Tukai, Nyiri Desert, 1200 m alt., alluvial plain in grassland, 15.9.1954, *Bally* 9885; Laitokitok, 1300 m alt., 1954, *G.A. Classen*, no number.

TANGANYIKA: Tanga Prov., Pare District, Same, 1100 m alt. (appr.), 4°5' S, 37°47' E, May 1928, *A.E. Haarer* 1365; near Same, 930 m alt., 3°48' S, 37°37' E, 23.1.1957, *Bally* 11367.

SUDAN: Mongalla Prov., Kaitherin Mts. on bare, rocky, very dry soil, fully exposed site, base of stem swollen, plant 20 cm high, fls. red, stamens yellow, 1520 m alt., 4°47' N, 35°16' E, July 1934, *W.N.R. Martin* 71.

Martin's locality "Mongalla, 5000 ft. alt., Kenya" required verification, for no locality of this name could be found on the Colony's maps, while Mongalla in the Southern Sudan had to be ruled out because of its much lower altitude. The writer is indebted to Miss Susan CARTER and to Mr. J.B. GILLET of the Kew Herbarium for going into the matter on his behalf. Their findings were as follows: W.R.H. MARTIN was a member of the "Lake Rudolf-Rift valley expedition" led by Vivian E. FUCHS in 1934; he was one of the two surveyors of the party. The sequence of the numbers on Martin's specimens corresponds with that of the places visited according to Fuchs' own account of the journey which was published in *Geogr. Journ.* **86**:114. 1935, although the dates differ in most cases; besides, very few notes went with the gatherings; MARTIN may have intended to write them up later; unfortunately he never had an opportunity to do so for he was tragically drowned with another member of the expedition, D.W.S. DYSON in Lake Rudolf at the end of July 1934; the bodies were never found. The number of MARTIN's specimen of *S. picticaulis* places it beyond doubt in the south-eastern corner of the Mongalla Province close to the Kenya border (hence "Mongalla, Kenya" on his label); furthermore, the altitude of 5000 ft. pinpoints the locality on Kaitherin Mts. The date, however, should be the end of March or the beginning of April, and not July 1934.

An allied species, perhaps a form only of *S. picticaulis*, represented by *Gillet* 14288, *Bally* 9122 and 11435 on Mega Mountain in S-Ethiopia has slenderer stems, less prominent leaf scars and somewhat smaller capitula; only *B* 11435 has flowered so far; its flowers are a rich purple. This was sent to the "Jardin Botanique Les Cèdres" in St. Jean Cap Ferrat, where it may still be in cultivation.

Living plants of Gillett's specimens, though in cultivation in Nairobi for many years, have never flowered.