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**Miscellaneous notes on the flora of Tropical East Africa
including description of new taxa. 8-15**

by

P. R. O. BALLY

Conservatoire et Jardin botaniques, Genève

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

8. *Rhytidocaulon* Bally, gen. nov. *Asclepiadacearum*

Rhytidocaulon Bally, gen. nov.

Genus novum a genere *Echidnopsis* caule solitario erecto scandente, tegumento ubique rugoso, papilloso, inflorescentiis unifloris distinguitur.

Plantae succulentae sparse ramosae. *Caules* erecti vel subscandentes ad 110 cm alti ad 15 mm crassi, cylindrici, 4-6-sulcati. *Rami* alterni, caule multo breviores, articulati, 5-9 mm crassi, 4-5-sulcati, tessellati, tessellis longitudinaliter rectangularibus, 7-12 mm longis, 3-6 mm latis; facies ramorum rugosa, papillosa, rava, in apicem viridirava. *Folia* minuta, carnosa, lanceolata, rugosa, papillosa, 2.5-3 mm longa, in apice acuta, in basi subcordata, mox decidua. *Flores* axillares solitarii, minuti, in caule et in ramis dispersi, subsessiles vel breviter pedicellati. *Calyx* 5-lobatus, lobis crassis, anguste deltoideis, 2 mm longis, extus papillis praeditus.

The genus is distinct from all other known Stapeliads by its growthform and by its characteristic rugose-papillose tegumentum; the flowers, though always solitary, are most nearly related to *Echidnopsis*.

Stems and *branches* fleshy, terete, to 110 cm high, to 15 mm thick, 4-6-angled, or ridged, indistinctly tessellate with longitudinally rectangular tessellations 7-12 mm long, 3-6 mm wide. All parts rugose-papillose, grey or dull green, more vividly green in the young shoots. *Leaves* minute, crowded at the apex of the branches, fleshy with a prominent midrib, rugose-papillose, 2.5-3 mm long, 2 mm wide near the subcordate base, acute, caducous. *Flowers* scattered along the stems and branches, often very

¹ *Candollea*, **17**: 25, 53, 71. 1959-1961; *l.c.* **18**: 9. 1962.

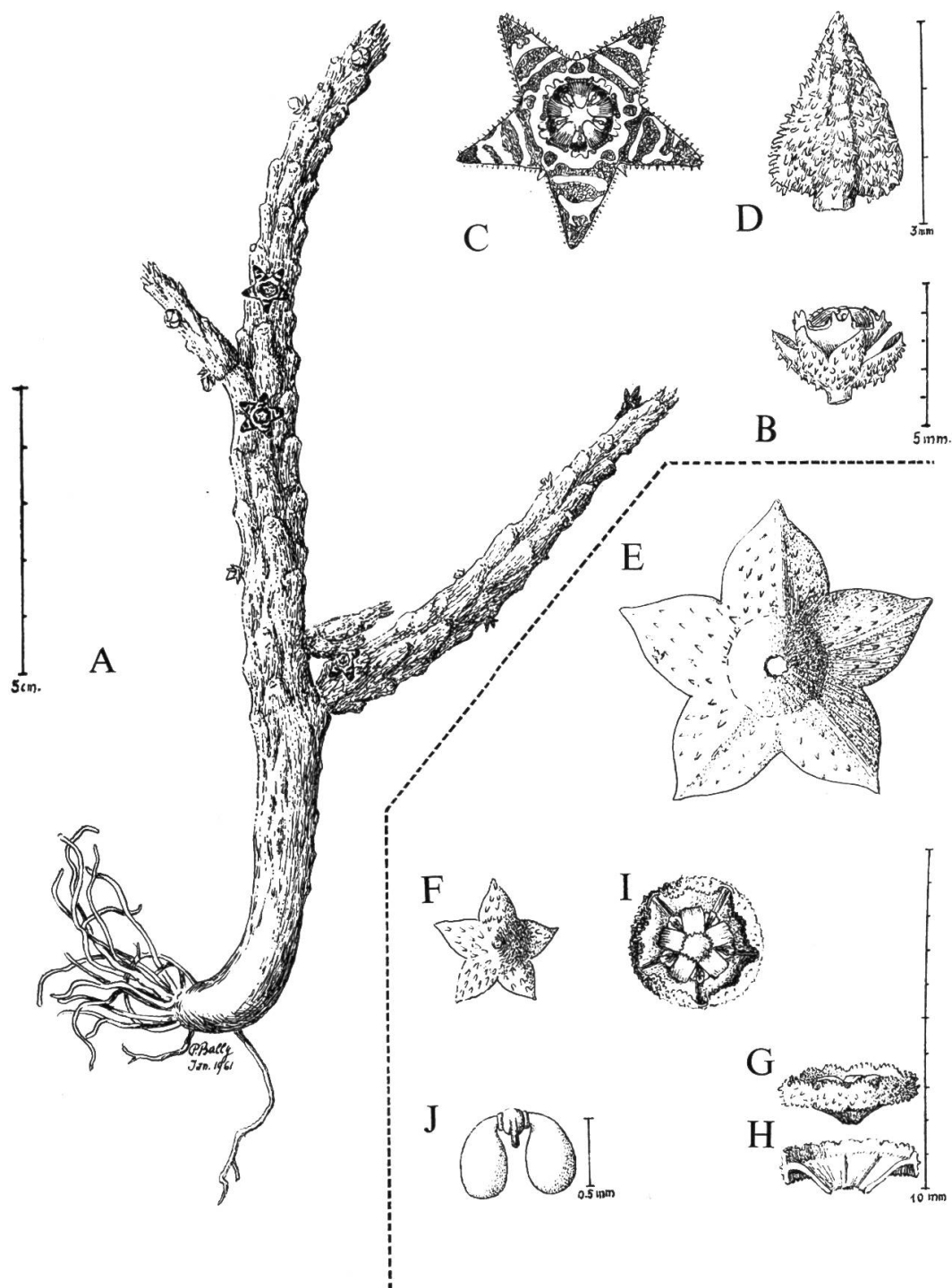


FIG. 84. — *Rhytidocaulon subscondens* Bally and *R. paradoxum* Bally
Rhytidocaulon subscondens: A, plant in flower; B, calyx and corona (corolla removed);
 C, flower seen from above; D, leaf. — *R. paradoxum*: E, corolla seen from below;
 F, calyx; G corona, side view; H, corona, cut longitudinally to show the rim-like
 outer corona; I, corona seen from above; J, pollen masses with pollen-carrier.

numerous, solitary in the leaf-axils, subsessile or shortly pedicellate. *Corolla* about 9 mm diam. 5-lobed, lobes spreading, triangular, corona variable.

TYPE SPECIES: Rhytidocaulon subscandens Bally

DISTR.: The plant is known only from a few gatherings in ETHIOPIA and SOMALIA; the dully coloured stems with their shrivelled surface are easily overlooked in the dry scrub where it occurs, or mistaken for dead vegetation, nor do the minute flowers catch the collector's eye. However, it is eagerly sought by man and beast on account of its sweet taste and juiciness; the Somali eat it raw or cooked.

***Rhytidocaulon subscandens* Bally, spec. nov.**

Caules, rami, folia ut in descriptione generis. *Flores* solitarii, in utraque parte caulis et ramorum dispositi, ex apicibus tessellarum orti. *Pedicellus* 0.5 mm longus, teres. *Calyx* 5-lobatus; lobi 5 lanceolati, 2.5 mm longi, 1.25 mm lati, carnosi, extus minute papilloso. *Corolla* 5-lobata, 9 mm diam., in basin breviter cupularis; lobi horizontaliter extensi, triangulares, acuti, 3 mm longi et lati, extus papilloso, virides, intus glabri, albescentes, rubromaculati ut in icone depictum. *Corona* subsessilis, 2.2 mm longa, 3.3 mm diam., lobi exteriores 5, breviter bifidi, 0.5 mm longi, erecti, interiores deltoidei, in apice obtusi, supra gynostegium conniventes.

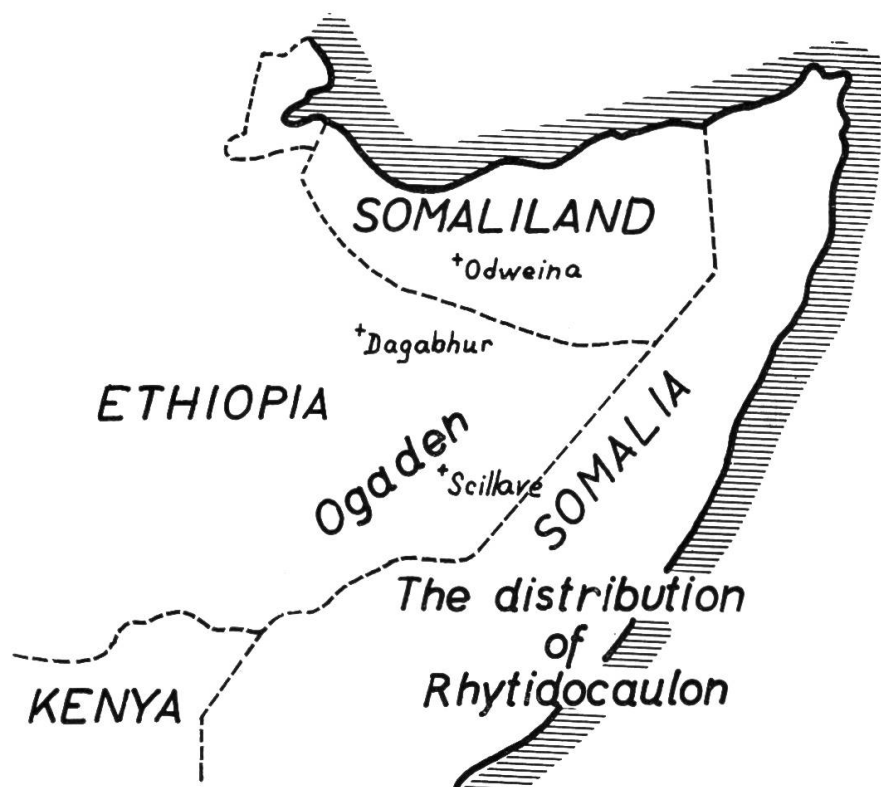


FIG. 85.

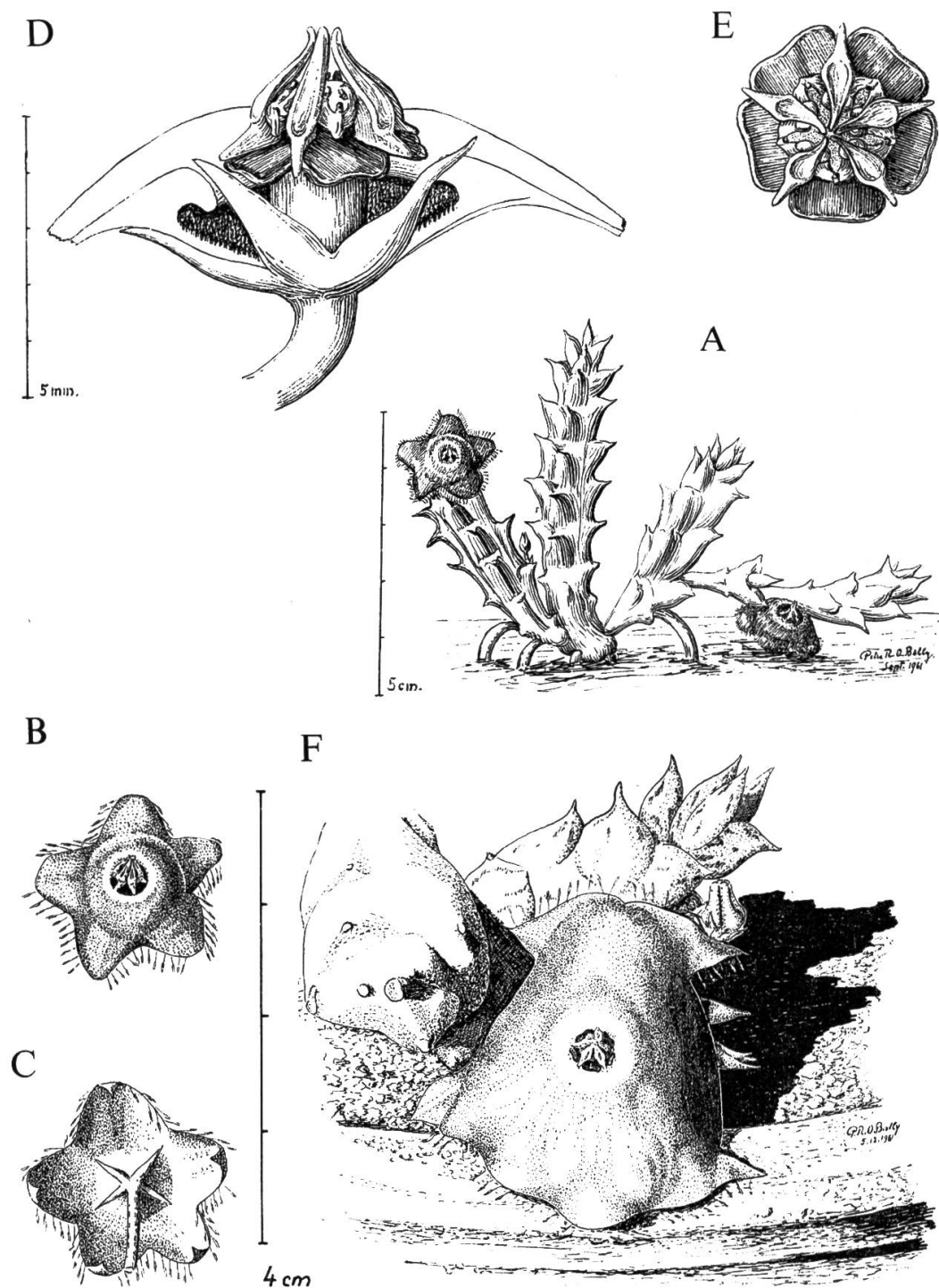


FIG. 86. — *Stapelia prognatha* Bally

A, plant in flower; B, flower from above; C, id. from below; D, id. sectioned to show the corona; E, corona seen from above; F, a large-flowered form from Meriye (Hemming, cult. in Pretoria).

DISTR.: SOMALILAND: between Hargeisa and Burao, ca. 9°23'N, 45°11'E, Jan. 1944, *Bally & Peck S 111* (holotype, G). — ETHIOPIA: Ogaden, at Daghabur, 8°07'N, 43°42'E, 1000 m, April 1943, *Jackson s.n.*

***Rhytidocaulon paradoxum* Bally, spec. nov.**

A *Rhytidocaulon subscandente* Bally lobis corollae latioribus, corona exteriore cinguliformi dinstinguitur.

Caules, rami, folia ut in *R. subscandente*. *Calyx* sessilis, carnosus, 5-lobatus 4 mm diam., intus glaber, extus sparse papillosus, lobis triangularibus, 1.6 mm longis, 1.3 mm latis. *Corolla* 9 mm diam., in basin tenuiter cupularis, duobus lobis horizontaliter divergentibus, late ovatis, in apice acutis, 2.9 mm longis, 3.1 mm latis. *Corona* 4 mm diam., 1.3 mm alta, rotata; coronae lobi exteriores 5, cingulum continuum, 0.75 mm latum, supra 10-lobatum, infra 5-lobatum formantes, intus glabrum, extus papillosum; lobi interiores subrectangulares, 1 mm longi, 0.75 mm lati, in apice truncati, denticulati, supra gynostegium conniventes.

DISTR.: ETHIOPIA: Ogaden, W of Shillave, sandy soil, dark green stem, green and pinkish-brown flowers, 06°25'N, 44°42'E, 400 m, Nov. 1955, *Ellis 405* (holotype K).

OBS.: *Rhytidocaulon subscandens* Bally can be considered to be the type species of this new genus.

9. ***Stapelia prognatha* Bally, spec. nov. Asclepiadacearum**

***Stapelia prognatha* Bally, spec. nov.**

Affinis *Stapeliae revolutae* Mass., sed herba pumilior, corona amplius corollam retusam excedens; coronae interiorae lobi breviori, in apicibus attenuati.

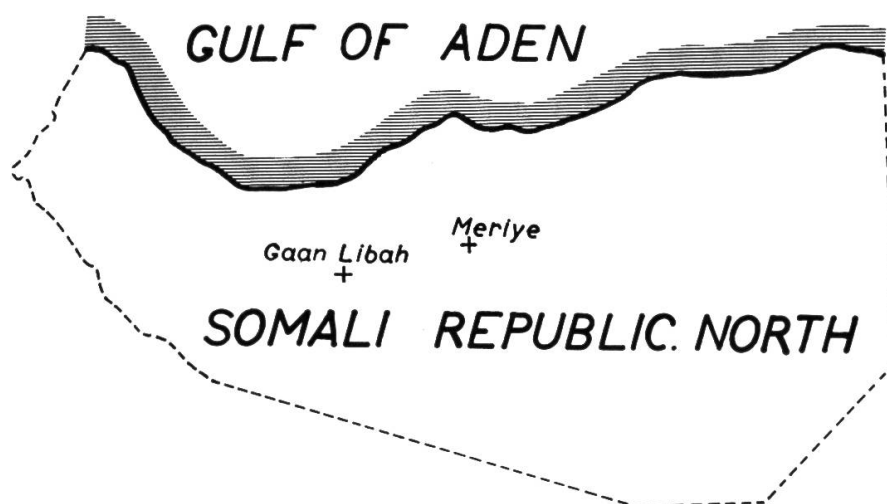


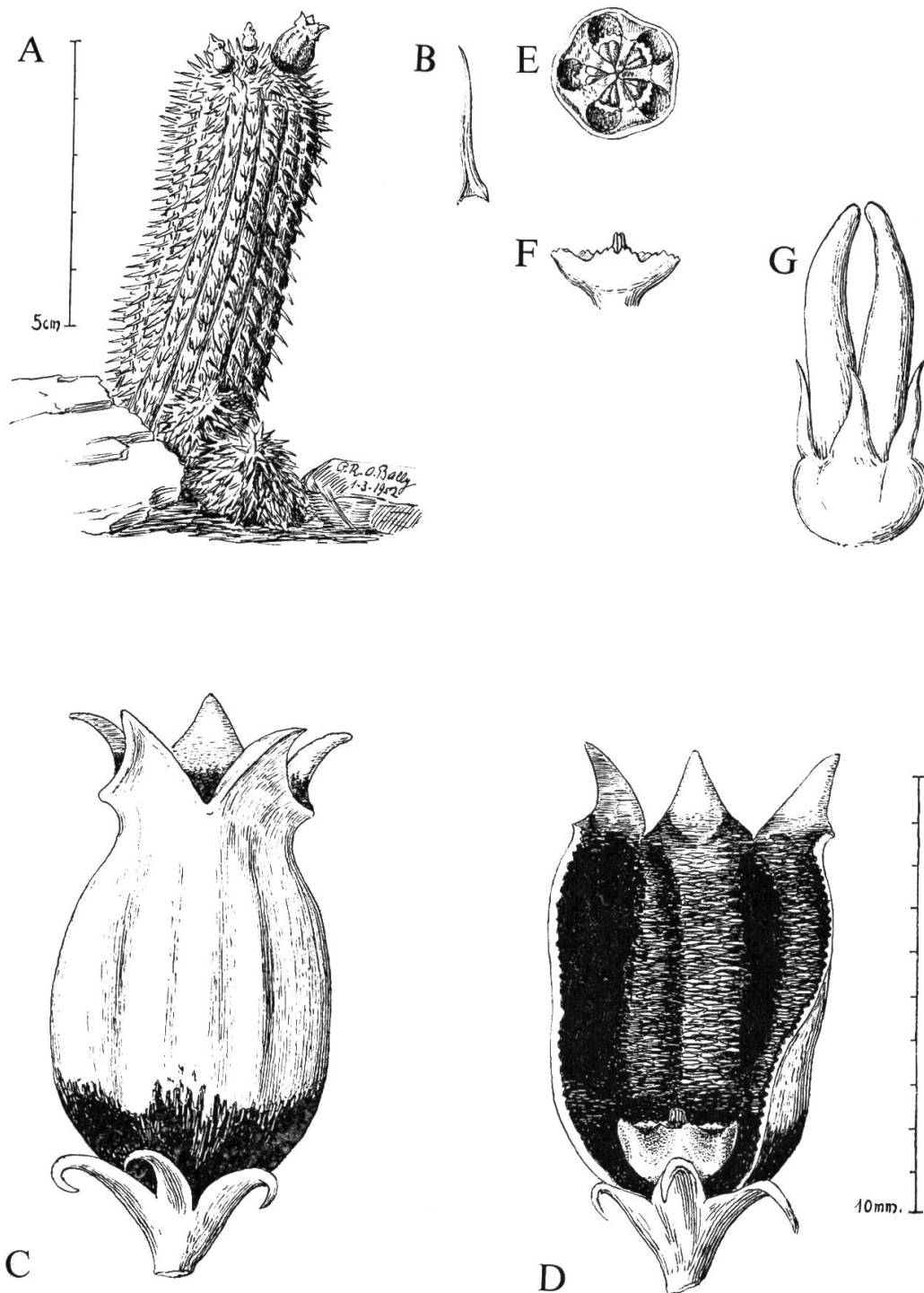
FIG. 87. — Distribution of *Stapelia prognatha* Bally

Planta pumila succulenta, usque 6 cm alta, plerumque minor. *Radices* paucae, fibrosae. *Caules* erecti vel decumbentes, nonnunquam radicibus caulinis crassioribus suffulti, sparse et breviter ramosi, quadrangulares, angulis dentatis; dentes carnosius adscendentes, acuti, apiculati, 7-10 mm inter se distantes, 3-4 mm longi. *Flores* ex axillis dentium in summo caule orti. *Bracteae* laterales minutae, subulatae, binae, 1 mm longae. *Pedicellus* 8-10 mm longus, teres, glaber. *Sepala* 5, anguste lanceolata, acuta, 3-4 mm longa. *Corolla* rotata, 5-lobata; 1.5-3.1 cm diam.; tubus in basi patelliformis, intus dense papillosus, deinde constrictus, incrassatus, annulum carnosum glabrum formans, deinde revoluto-extensus, inverse infundibuliformis, lobis 5, late triangularibus, acutis, reflexis, marginibus ciliatis; corollae facies superior livida. *Corona* stipitata, supra corollam elatata, 2-4 mm alta, 3.5-4.5 mm diam.; stipes annulum aequans; corona externa applanata, 5-lobata, lobis leviter emarginatis, marginibus incrassatis; corona interna lobis incrassatis, suberectis, lanceolatis, in dorso excavatis, supra gynostegium conniventibus, in basi horizontaliter extensi. *Follicula* et *semina* haud visa.

This species has its nearest affinity in the South African *Stapelia revoluta* Mass.; its corolla is more pronouncedly retuse, causing the corona to protrude even further; the inner segment of the inner corona is shorter and not thickened at the apex, the outer segment is not erect but it spreads horizontally at the level of the outer corona.

A dwarf, succulent *plant* up to 6 cm high but usually less. *Stems* erect of procumbent, quadrangular, toothed along the angles, teeth fleshy, ascending, acute, apiculate, 7-10 mm distant, 3-4 mm long. *Roots* weak, fibrous, stems often supported by reflexed, rigid, adventitious roots to 2 mm thick. *Flowers* solitary in the axils of the teeth, usually near the apex of the stem, occasionally lower. Lateral *bracts* minute, subulate, paired, 1 mm long. *Pedicel* 8-10 mm. long, terete, glabrous, fleshy, 1.5 mm thick. *Calyx* small, lobes narrowly lanceolate, 3-4 mm long, acute, reflexed. *Corolla*: 1.5-1.8 cm diam. in the type, but specimens with a diam. of 2.7-3.1 cm have been observed; tube shallowly saucer-shaped, inner surface densely papillate, upper margin constricted into a fleshy disk, its outer margin reflexed and terminating in 5 broadly triangular lobes with reflexed tips and ciliate margins. *Corona* 2-4 mm high, 3.5-4.5 mm diam. at the base, stoutly stipitate; stipe terete, 1.2-1.5 mm long; outer corona disk-like, 5-crenate, crenations sinuate-emarginate with thickened margins, dark purple; inner corona lobes fleshy, narrowly triangular, incumbent-ascending over the staminal column, upper part longitudinally excavate, basal portion prolonged into a narrowly triangular, horizontally spreading tooth; the diameter and shape of the corona vary greatly in this species as evidenced in the illustration which shows flowers of different gatherings in natural size; the corolla lobes are naturally reflexed, but often they cling limpet-fashion to the stem or other surfaces with which they come into contact; corolla uniformly livid blueish purple; outer corona purplish black, inner corona pale yellow-brown.

DISTR.: SOMALI REPUBLIC NORTH: Golis Range, Gaan Liban, in shelter of rock, juniper forest, 9°35'N, 44°48'E, 1800 m, 23 July 1945, *Glover* in *Bally S 147* (holotype K); *ibid.*, in shelter of *Buxus hildebrandtii*, *Acacia etbaica*, *Cadia purpurea*, in leaf-mould, fleshy plant, stems linked together, *Bally B 11697*; N-E of Burao at Meriye, 9°49'N, 45°56'E, *Hemming s.n.*, cult. Pretoria 1955.

FIG. 88. — *Echidnopsis urceolata* Bally

A, plant in flower; B, leaf; C, mature flower; D, id., half of the corolla removed to show the corona; E, corona seen from above; F, id., side view; G, immature follicles.

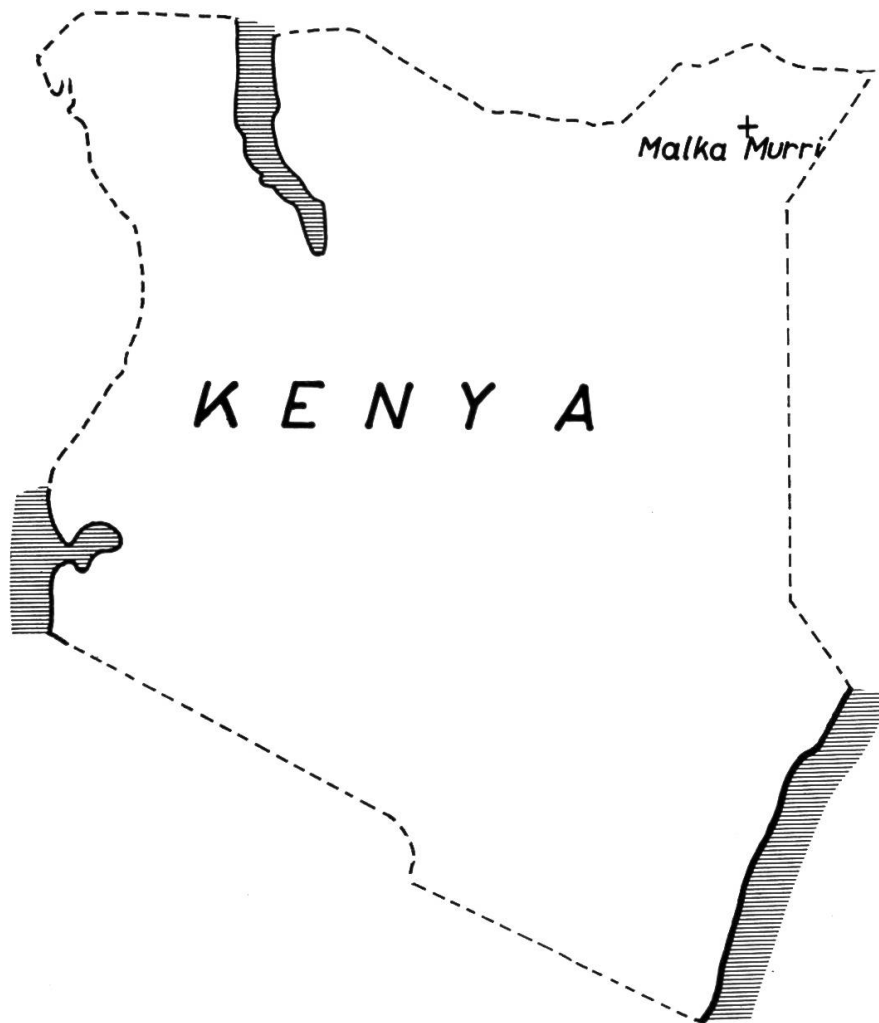


FIG. 89. — Distribution of *Echidnopsis urceolata* Bally

10. *Echidnopsis urceolata* Bally, spec. nov. Asclepiadacearum.

***Echidnopsis urceolata* Bally, spec. nov.**

Cum *E. watsonii* Bally (vide infra) inter species eiusdemgeneris corollae tubo ut in *Stapeliopsidi cooperi* Phillips urceolato, haud rotato vel campanulato-rotato distinctissima; ab *E. watsonii* caulibus erectis, angulatiorebus, tuberculis foliis dessicatis coronatis differt.

Planta pumila, percrassa, omnino glabra. *Radices* fibrosae, tenues. *Caules* erecti, 1-6 simul e basi orti, usque 8 cm alti, 2.5 cm diam., 18-20-angulati, dense tuberculati; tuberculi 1×1 mm, foliis filiformibus, persistentibus, 3-3.5 mm longis, canaliculatis, mox dessicatis coronati. *Flores* subsessiles, erecti, ex apice caulis orti, axillares, singulatim editi. *Calyx* 5-lobatus; lobi lanceolati, +3 mm longi, 1-1.5 mm lati, acuti in apice reflexi. *Corolla* 10.5 mm longa, 6-7 mm diam.; tubus urceolatus, 9 mm longus,

infra 6-7 mm diam., in apice constrictus, 4 mm diam., extra glaber, pallide viridis, in basi atropurpureus, intus transverse rugosus, atropurpureus; lobi 5, late triangulares, 3 mm longi et lati, marginibus et apicibus leviter recurvis, intus et extra pallide virides. *Corona* corollae tubo inclusa, breviter stipitata; stipes 0.25-0.5 mm longus; corona externa late cupuliformis, obtuse 5-lobata, lobis crenulatis, 1 mm altis sacculos includentibus; lobi interni anguste triangulares, 1.25 mm longi, in apice lineares, obtusi, supra gynostegium conniventes, dum erecti. *Follicula* matura et *semina* haud visa.

A dwarf, fleshy, erect *plant*, glabrous in all parts. Roots fibrous, weak. Stems erect, solitary or up to 6 from the same base, up to 8 cm high, 2.5 cm diam., cylindrical, 18-20-angled, densely tuberculate; tubercles 1 mm wide and high, crowned with the persistent dessicated, filiform, channelled, 3-3.5 mm long leaves. *Flowers* subsessile, erect, arising from the apex of the stems, apparently solitary in the axils of the tubercles. *Calyx* 5-lobed, lobes lanceolate $\pm$ 3 mm long, 1-1.5 mm wide at the base, acute, with recurved tips. *Corolla* up to 10.5 mm long, 6-7 mm diam.; tube urceolate, 9 mm long, 6-7 mm diam. at the middle, constricted at the apex to 4 mm diam., glabrous and pale green, shaded into purple outside, transversely rugose and uniformly dark purplish red inside; lobes 5, broadly triangular, 3 mm long and wide, their margins and apex slightly recurved, pale green on their inner and outer surface. *Corona* shortly stipitate, 3 mm wide, 2 mm high; stipe 0.25-0.5 mm long, fleshy; outer corona widely cupular, obtusely 5-lobed, lobes denticulate, each enclosing a circular pouch; inner lobes narrowly triangular, obtusely linear towards the tips, incumbent on and connivent over the staminal column. Mature follicles and seeds not seen.

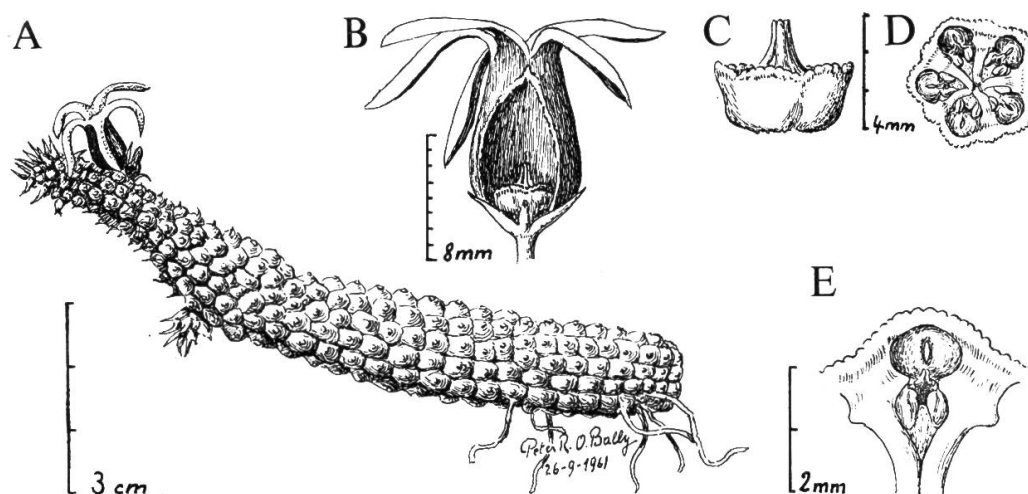
DISTR. KENYA, Northern Frontier Prov.: near Ethiopian border at Malka Murri, 4°15'N, 40°42'E, 600-700 m, June 1951, *Williams in Bally B 8008* (holotype K).

11. *Echidnopsis watsonii*, spec. nov. *Asclepiadacearum*.

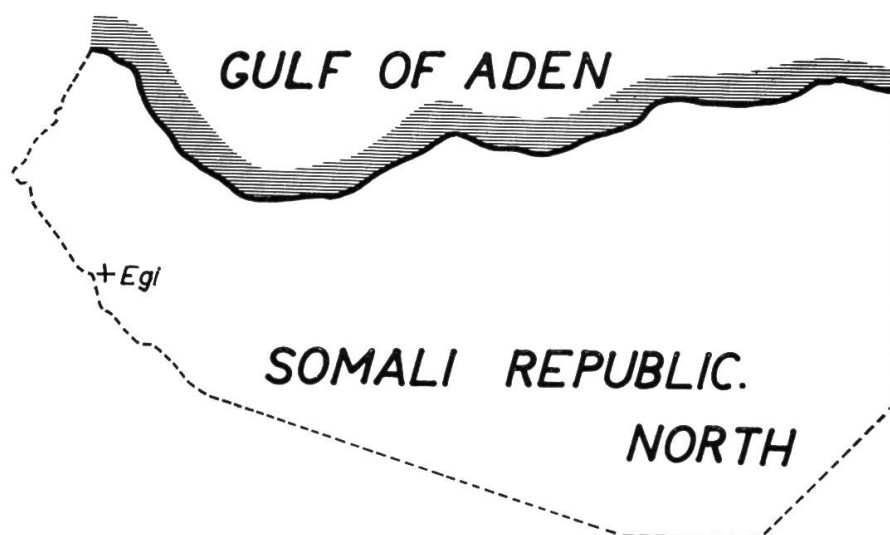
Echidnopsis watsonii Bally, spec. nov.

Species cum *E. urceolatae* Bally (vide supra) inter species eiusdem generis corollae tubo ut in *Stapeliopsidi cooperi* Phillips urceolato, haud rotato vel campanulato-rotato distinctissima; ab *E. urceolatae* caulibus decumbentibus minus angulatis, foliis mox deciduis differt.

Planta succulenta, glabra. *Caules* carnosii, prostrati, in apice suberecti, sparse ramosi, rhizomatosi, usque 20 cm longi, 8-15 cm crassi, 8-12-angulati, minute tuberculati; tuberculi 4-5-angulati, tessellati, 3-4 mm longi et lati, 1-2 mm alti, in apice cicatricibus foliorum delapsorum coronati. *Folia* anguste lanceolata vel setosa, reflexa, 1.5 mm longa, mox decidua. *Flores* singuli ex apicibus caulis et ramorum seriatim orti, axillares, brevissime pedicellati. *Pedicellus* usque ad 1 mm in longitudine et diametro. *Calyx* breviter cupularis, 5-lobatus; lobi lanceolati, 3 mm longi, in basi 1 mm lati, patentes. *Corollae* tubus obpiriformis, 6.5-7 mm longus, in basi 4-5 mm, in ore 3 mm diam., extra et intus glaber, atropurpureus; corollae lobi late reflexi, lineares, apiculati, 5-7.5 mm longi, 1.5 mm lati, marginibus recurvis, extra purpurei, intus (superne) flavi, rugulosi. *Corona* corollae tubo inclusa, 2.25-2.5 mm lata, 2 mm longa, obtuse 5-angulata, omnino atropurpurea; lobi externi marginem continuum, 1.5 mm altum, breviter et late 5-lobatum, minute crenulatum efformantes, lobo

FIG. 90. — *Echidnopsis watsonii* Bally

A, flowering stem; B, corolla, cut open to show corona; C, corona, side view; D, id., seen from above; E, id., details of slitted pouch, much enlarged.

FIG. 91. — Distribution of *Echidnopsis watsonii* Bally

sacculum quoque includente in basi incrassata incisum; lobi interni erecti, lineares, 2 mm longi, 0.15-0.2 mm lati, in basi supra stamina incumbentes, in apice erecto-conniventes.

A dwarf, glabrous succulent *plant*. Stems fleshy, prostrate, suberect towards the apex, sparsely branched, to 20 cm long; branches shorter and somewhat thinner, cylindrical, obscurely 8-12-angled, tuberculate; tubercles tessellate, 4-5 angled, 3-4 mm long and wide, 1-2 mm high, crowned by the leaf-scar. Leaves narrowly lanceolate, reflexed, setose when dry, 1.5 mm long, soon deciduous. Flowers arising from the tips of the branches, one or few, solitary in the axils of the tubercles, shortly pedicellate. Calyx shallowly cup-shaped, lobes 5, lanceolate, 3 mm long long, 1 mm wide at the base, erect-spreading. Corolla-tube inverted pear-shaped, 6.75-7 mm long, 4-5 mm

diam. at the base, 3 mm diam. at the orifice, glabrous and dark purplish red inside and outside; corolla lobes spreading-reflexed, broadly linear, apiculate, 5-7.5 mm long, 1.5 mm wide, outside dark purplish red, inside (upper surface) yellow, rugulose, margins recurved. *Corona* included, sessile, 2.25-2.5 mm wide, 2 mm long, obtusely 5-angled, dark purplish red in all parts, the outer lobes forming a cup, 1.5 mm high, shortly and broadly 5-lobed, minutely crenulate, each lobe forming a pouch with a small incision in its fleshy base; inner lobes linear, 2 mm long, 0.15-0.2 mm wide, erect, incumbent over the staminal column, erect-connivent at the apex.

DISTR.: SOMALI REPUBLIC NORTH: Borama District, 8 miles S-E of Borama, 9°51'N-43°16'E, 1600 m, 6 Oct. 1954, *Bally & Watson B 9997* (holotype K).

12. *Caralluma furta* Bally, spec. nov. *Asclepiadacearum*

Caralluma furta Bally, spec. nov.

Planta omnino carnososa. *Caulis* obtuse quadrangularis, ca. 7 cm altus, in basin 1 cm crassus, apicem versus angustatus, supra basin multiramosus, ramis 3-5 cm longis, in basin 6-8 cm crassis, supra attenuatis; anguli dentati, dentibus prominentibus, leviter ascendentibus, ad 2 mm longis, in apice obtusis, infra 1.5-2 cm, apicem versus 1 mm distantibus; color ramorum pallide viridis, in angulis viridispadiceus. *Folia* minuta, squamosa, ca. 0.6 mm longa, caduca. *Flores* solitarii aut bini (fortasse plures?) axillarii in apicibus ramorum producti, erecti, subsessiles, 7 mm longi. *Pedicellus* minus 1 mm longus, glaber, teres. *Calyx* glaber, pallide viridis, lobis lanceolatis acutis, 2 mm longis, in basin 0.5 mm latis, purpureo-marginatis munitus. *Corolla*

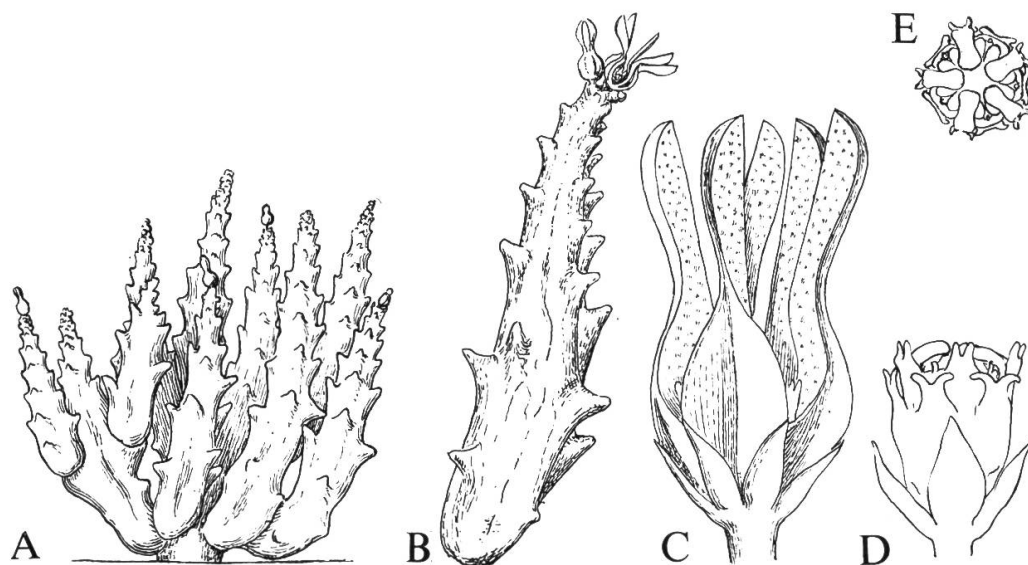
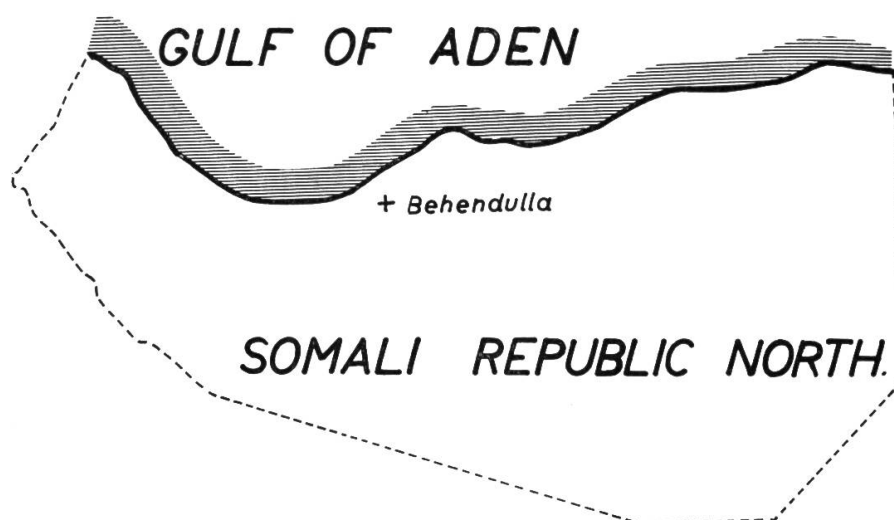


FIG. 92. — *Caralluma furta* Bally

A, whole plant with flower-buds; B, flowering stem; C, mature flower; D, corona, side view; E, id., seen from above.

FIG. 93. — Distribution of *Caralluna furta* Bally

glabra, 6 mm longa, profunde lobata; tubus late cupularis, 1 mm longus, 2.5 mm latus in basin, parte inferiore viridis, superiore pallide ruber; lobi 5 erecto-divergentes, longitudinaliter plicati, 5 mm longi, in basin 2 mm lati, medium versus constricti, supra medium lineares, spatulati, in apicem abrupte acuti, albescentes, in parte superiore pallide virides, intus minute purpureomaculati. *Corona* 3 mm alta, 2 mm diametro, subpedicellata, tubum 1.5 mm excedens; coronae lobi exteriores erecti, breviter bicornuti, cornui divergentes, reflexi, pallide lutei, rubescentes; lobi interiores spatulati, supra gynostegium incumbentes, in dorso breviter bifidi, pallide lutei, minutissime purpureomaculati. *Fructus et semen* haud visa.

A dwarf succulent *plant*. *Stem* obtusely 4-angled, fleshy, ca. 7 cm high, 1 cm thick at the base, tapering towards the apex, much branched just above the base, branches 6-8 mm thick at the base, 3-5 cm long; angles toothed, teeth prominent, ascending, to 2 mm long, 1.5-1 cm distant at the base, progressively closer and to 1 mm distant at the apex; colour pale greenish gray with a dull greyish purple band running along the angles including the teeth. *Leaves* scale-like, 0.6 mm long, soon deciduous. *Flowers* 2 (or more?) produced from the apical leaf axils, erect, subsessile, ca. 7 mm long. *Pedicel* less than 1 mm long, terete. *Calyx* pale green; lobes 5, green edged with purple and with purple tips, lanceolate, acute, 2 mm long, 0.5 mm wide at the base, glabrous. *Corolla* glabrous, 6 mm long, very deeply lobed; tube 1 mm long, 2.5 mm wide, shallowly cupular, pale green at the base, shading to pale purple above; lobes erect-spreading, longitudinally folded 5 mm long, 2 mm wide at the base, constricted towards the middle, linear-spathulate in the upper half, abruptly acute at the apex, white, shading into pale green in the upper third, inner surface with minute purple dots. *Corona* sub-pedicellate, 3 mm high, 2 mm diam., exceeding the tube by more than half its length, outer lobes bifid with short, spreading horns, pale buff, slightly tinged with purple; inner lobes spatulate, obtuse, incumbent over the staminal column with two short, erect dorsal horns, pale buff, minutely and densely speckled with purple. *Follicles and seeds* not seen.

DISTR.: SOMALI REPUBLIC NORTH; North of Sheik Pass at Behendulla, on stony alluvial soil, 10°12'N, 45°06'E, 720 m, 28 May 1949, *Bally B 7129* (holotype K).

OBS.: C. furta with its distinctly tapering but not extremely elongate stems and branches holds the middle between the sections *Caralluma* and *Boucerosia*. The obtusely quadrangular stems with short, slightly ascending teeth are reminiscent of those of *C. socotrana* Balf.f. and in fact the writer mistook the only plant he found in March 1949 for a seedling of the latter and sent it to Kew for cultivation under that name. In September of the same year the plant produced a few minute flowers with the characteristic narrow folded corolla lobes known in the *Carallumas*. A drawing was made at once from the living plant and a short growth with a flower and a bud was preserved in spirit. On the following day the plant had disappeared from the tropical house. In subsequent years the writer visited the same locality repeatedly but he did not succeed in finding more specimens. The fragment in spirit and the drawing are therefore the only record of this rare *Caralluma*. It had probably caught the fancy of an over-enthusiastic visitor. Thefts of small succulents are not uncommon in public collections and must be reckoned with, but the removal of this rare specimen was the more regrettable that the plant was never collected again.

13. *A new Euphorbia from South Central Africa.*

Euphorbia decidua Bally et Leach, spec. nov.

Affinis *Euphorbiae imitatae* N.E. Br. sed ramis deciduis, cymas haud gerentibus, ex radice ortis differt.

Herba carnosa humilis. *Radix* tuberosa. *Caulis* valde reductus, subterraneus; rami pauci vel numerosi, haud aut raro furcati, erecti, ad 12 cm alti, 6 mm crassi, 3-angulati, in angulis dentati, decidui; dentes ramorum ad 2.5 mm alti, 2-10 mm distantes, scutellis rotundatis, badiis, bispinosis coronati; spinae 1.5-4.5 mm longae, divergentes, in basi inflatae, aculeis stipularibus binis minutis, recurvatis muniti. Supra scutellum *folium* unicum, subcarnosum, erectum, lanceolatum, in apice acutum, ad 3 mm longum, 1 mm latum; in angulis 1-2 mm supra folium cymae gemma abortiva vix producta. *Cymae* ramis demissis paucae vel numerosae 1-2-furcatae ex radice ortae; pedunculus teres, carnosus, 7-17 mm longus, 3-4 mm crassus; cymae rami primarii 5-30 mm longi, pedunculo aliquanto tenuiores, secundarii ca. 4 mm longi. *Cyathii prophylla* bina, spathulata subcrassa carinata 2.75 mm longa, 2 mm lata, involucrum subaequantia, in margine membranacea, supra fimbriata. *Cyathium* prophylla vix superans; glandulae 5, transverse oblongae contiguae, 1 mm longae, 1.5-2 mm latae, carnosae, excavatae, margine exteriori integro vel leviter undulato. *Lobi* 5, erecti, membranacei, semiorbiculati, 1 mm alti et lati, in margine profunde fimbriati. *Flos stamineus*: pedicellus 3 mm longus, filamentum 0.6 mm longum; antherae 2, subglobosae, 0.5 mm diam. *Flos femineus*: pedicellus capsulae reflexus, teres, carnosus, ad 6 mm longus, supra obtuse trilobatus. Capsula glabra profunde trilobata, 3.25 mm longa, 4.5 mm diam., angulis subacutis styli 3, usque ad basim divisi, reflexi, 1.4 mm longi, in apice bifidi. *Semen* subglobosum circa 2 mm diam., haud carunculatum.

A dwarf, fleshy *herb* with a tuberous root. Stem reduced to a subterranean growing point. Branches few to numerous, simple or rarely forked, erect, to 12 cm

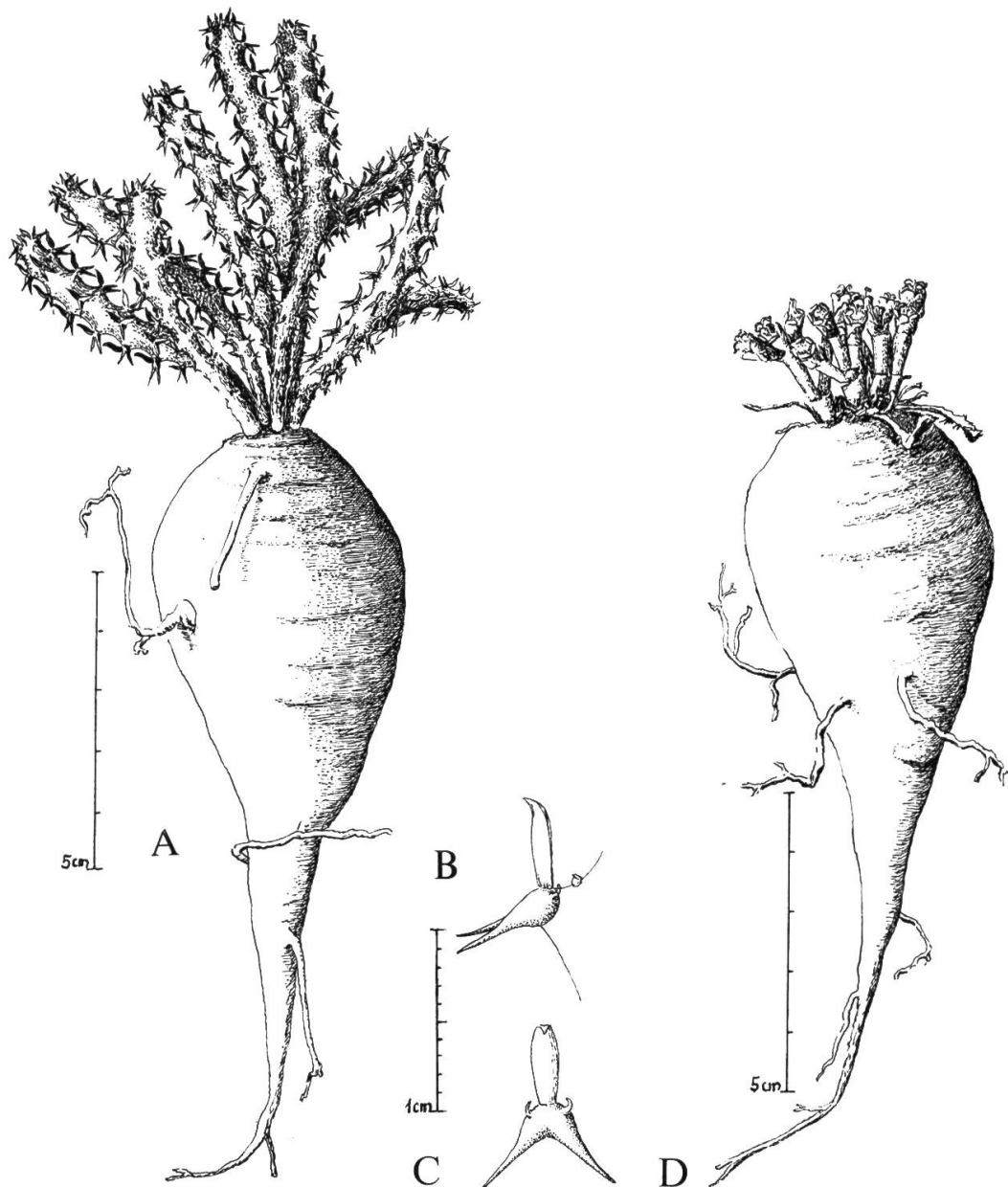
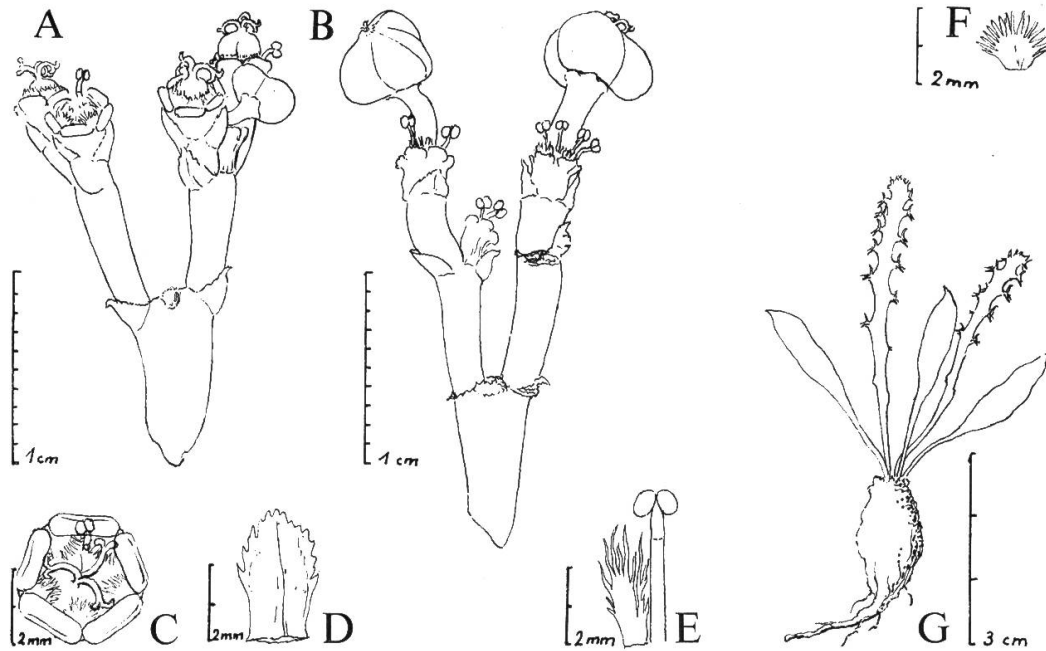


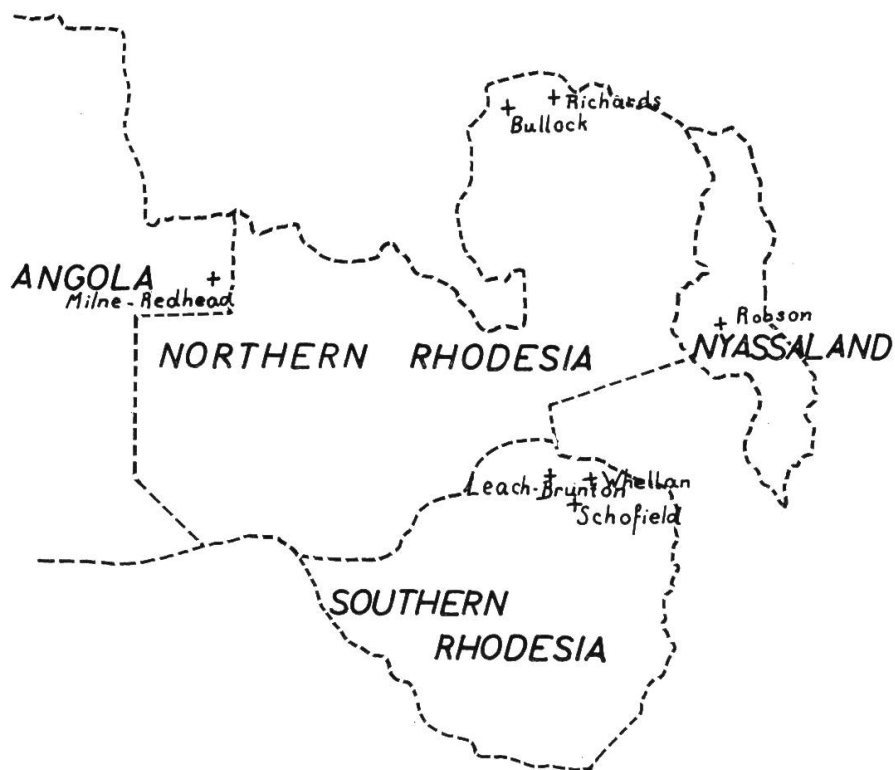
FIG. 94. — *Euphorbia decidua* Bally

A, plant in the vegetative stage; B, spine-shield and leaf, side view showing the abortive flowering eye; C, id., frontal view; D, plant in the flowering stage.

high, to 6 cm thick, 3-angled, deciduous; teeth along the angles to 2.5 cm high, 2-10 mm distant, crowned with rotund, double-spined, reddish-brown shields about 2.5-3 mm diam., spines diverging, 1.5-4.5 mm long, inflated at the base; stipular prickles 2, minute, recurved. *Leaf* produced from the upper edge of the spine-shield, fleshy, erect, lanceolate, acute, to 3 mm long, 1 mm wide; along the angles, 1-2 mm above the leaves, abortive cyme-buds are produced. After the shedding of the branches few to numerous 1-2-forked *cymes* are produced from the subterranean stem;

FIG. 95. — *Euphorbia decidua* Bally

A, flowering cyme; B, fruiting cyme; C, involucre from above; D, involucral bract; E, staminate flower and bracteole; F, lobe; G, Robson's aberrant plant from Nyasaland.

FIG. 96. — Distribution of *Euphorbia decidua* Bally

peduncle terete, fleshy, 1-17 mm long, 3-4 mm thick; primary cyme-branches 5-30 cm long, slightly thinner than the peduncle; secondary cyme-branches 4 mm long. Involucral *bracts* in pairs, spatulate, slightly fleshy, keeled, 2.75 mm long, 2 mm wide, subequalling the involucre, with a membranaceous margin, fimbriate along the upper edge. *Cyathium* subequalling or somewhat exceeding the bracts; glands 5, transversely oblong, 1 mm long, 1.5-2 mm wide, contiguous, fleshy, concave, the outer, slightly raised rim entire or slightly undulate. *Lobes* 5, erect, membranaceous, semicircular, 1 mm high and wide, with deeply fimbriate margins. *Male flowers*: pedicel 3 mm long, filament 0.6 mm long; anthers 2, subglobose, 0.5 mm diam. *Female flowers*: solitary, pedicellate, pedicel reflexed, terete, fleshy, to 6 mm long, with an obtusely 3-lobed perianth-rim. *Capsule* glabrous, deeply 3-lobed, 3.25 mm long, 4.5 mm diam., with subacute angles; styles 3, free to the base, reflexed, 1.4 mm long, with deeply bifid tips. *Seed* subglobose, appr. 2 mm diam., without a caruncle.

DISTR.: ANGOLA: Moxico Distr., between the rivers Zambesi and Luisabo, in sand among rocks, forms clumps to 1 m diam., underground stem thick, woody, 11°28'S, 23°55'E, ca. 1400 m, 20 Jan. 1938, *Milne-Redhead 4251* (K). — NORTHERN RHODESIA: Mweru Wantipa, Jan. 1944 *Bredo in Bally E 271* (syntype K); *ibid.*, on banks of Mamwezi River, at Nsama, 8°53'S, 29°58'E appr., 1075 m alt., 1950, *Bullock in Bally E 271a* (syntype K); Mporokoso Distr. top of Masanka Lufubu divide, completely dried up ground, no other vegetation, length of tubes 26 cm, shaped like a turnip, flower cream, fruits green, 8°47'S, 30°12'E, 1050 m, 26 Sept. 1956, *Richards 6312* (K). — SOUTHERN RHODESIA: Lomagundi Distr., Sipolilo, 16°14'S, 30°42'E, 1520 m, Feb. 1958, *Whellan in Govt. Herb. 21938*; Sipolilo Distr., 12 miles north of Sipolilo, 16°28'S, 30°43'E appr., 1210 m, 16 April 1960, *Leach & Brunton 9873*; Darwin Distr., 20 miles north of Mt Darwin, *Wild 4811* (SR, GH); 20 miles S-E of Sipolilo, *P. Schofield s.n.* (SR, GH). — NYASALAND: Chamala-Kasungu Distr. n'r Chimala Hill, *Brachystegia bussei* woodland, bears leaves when young, fls. orange, large, fleshy tuber, latex, 12°56'S, 33°29'E, 1000 m, 16 Jan. 1959, *Robson 1225*.

OBS.: *Euphorbia decidua* is the only known spiny succulent *Euphorbia* which is wholly deciduous. The abortive cyme-buds above the spine-shields are indicative of an ancestral form with cymes produced from persistent stems and branches, similar to other spiny *Euphorbias*; it has obviously evolved from a shrublet towards a geophyte, a common tendency among the most diverse plant-families in the region where *E. decidua* occurs, caused no doubt by specific climatic conditions.

An indication that this trend of evolution towards extreme geophytism has not yet attained its final stage appears to be demonstrated in a single specimen collected by *N.K.B. Robson* in Nyasaland, in which large leaves—possibly of stipular origin—are produced from the subterranean stem beside the branches. The eventual substitution of the present deciduous spiny branches (which have already lost their original function) by conventional leaves would be an obvious improvement, for geophytism tends towards utmost economy in the production of a minimum of the essential functional parts.

The three striking characters of *E. decidua*, i.e. : the short-lived, deciduous branches, their abortive cyme-buds, the occasional production of functional leaves show a plant quite obviously in a stage of transition between two very distinct growth forms.

14. *Euphorbia cryptospinosa* Bally, *spec. nov.*

Euphorbia cryptospinosa* Bally, *spec. nov.

Species affinis *E. erlangeri* Pax, sed spinis valde reductis, erectis, caulium angulis pluribus, podariis spinarum in partibus juvenilibus minute puberulis differt.

Frutex erectus, sparse ramosus, ad 2 m altus, habitu subscandenti. *Radices* fibrosae. *Caulis* solitarius, teres ad 7 mm crassus, longitudinaliter 5-7-sulcatus. *Rami* teretes 4-5-sulcati, alternati oppositi, vel 3-6-fasciculati, 1.5-25 cm longi, circiter 3 mm crassi; costae inter sulcos corneae continuae, 2-2.5 mm latae, scutellis spinarum confluentibus formatae, brunneae, minute puberulae; spinae geminatae exiguae, ad 1.5 mm longae in partibus juvenilibus, erectae, adpressae, minute puberulae, vel absentes; aculei secundarii absunt; sulci intercostati costis angustiores, virides. *Folia* deltoidea, carinata, 1-1.5 mm longa, decidua. *Cymae* semel furcatae, sessiles. *Involucrum* primarium mox deciduum, involucri lateralia sessilia, 2 mm alta 2.75-3.5 mm lata, minus glandulosa 1.5 mm lata; involucri bracteae 2, oppositae, rectangulares, 1-1.2 mm longae, 0.8-0.9 mm latae, in margine laciniatae. *Glandulae* 5, contiguae, transverse rectangulares, angulis rotundatis, 1.5 mm latae, 0.5 mm longae, patentes. *Lobi* 5, subrotundi, in basi angustati, profunde laciniati 1 mm longi et lati. *Flores masculi* cum pedicellis 2.5 mm longi; filamenta 1 mm longa, antherae binae, 1 mm latae. *Flores feminei*: ovarium subglobosum, glabrum, breviter pedicellatum; perianthium ad marginem integrum reductum; styli usque ad basim divisi, 1.25 mm longi, in apice bilobati. *Capsula* subglobosa, 2.2 mm diam., subcarnosa, atrorubra. *Semen* globosum, 1 mm diam., griseum, rugosum.

DISTR.: KENYA, Northern Frontier Prov. : Garissa, 0°28'S, 39°39'E, 100 m, 27 May 1941, *Bally E 159* (holotype K, isotypes EA, G); Dandu, 3°26'N, 39°54'E, 1250 m, 6 June 1952, *Gillett 13430* (K); Moyale, 3°32'N, 39°03'E, 1250 m, 30 July 1952, *Gillett 13657* (K). — Southern Prov. : Machakos Distr., near Lugard's Falls, 3°03'S, 38°41'E, 400 m, 2 March 1953, *Bally 8659* (K, EA). — Coast Prov. : Tana River Distr., Ngangerabeli Plain at Galole, in thorn scrub, locally common, 1°30'S, 40°02'E, 200 m, *Bally 12067* (K, EA, G). — Rift Valley Prov. : Samburu Distr., El Barta Plains near Ndoto Mts, 1°40'N, 36°55'E, 1200 m, 4 Jan. 1959, *Newbould 3442*. — SOMALI REPUBLIC : 2 miles east of Beles Gogani, in open tree savanna with *Acacia spirocarpa* and *Terminalia spinosa* dominant, scrambling, fleshy, leafless climber, 0°25'N, 41°01'E, 120 m, 26 Jan. 1954, *Bally 9503*, (K, Ea, G).

OBS.: This species, though widely spread in the drier regions of Kenya, has long remained unknown on account of its highly protective appearance; the cylindrical stems and branches are a dull brown along the ridges and grey

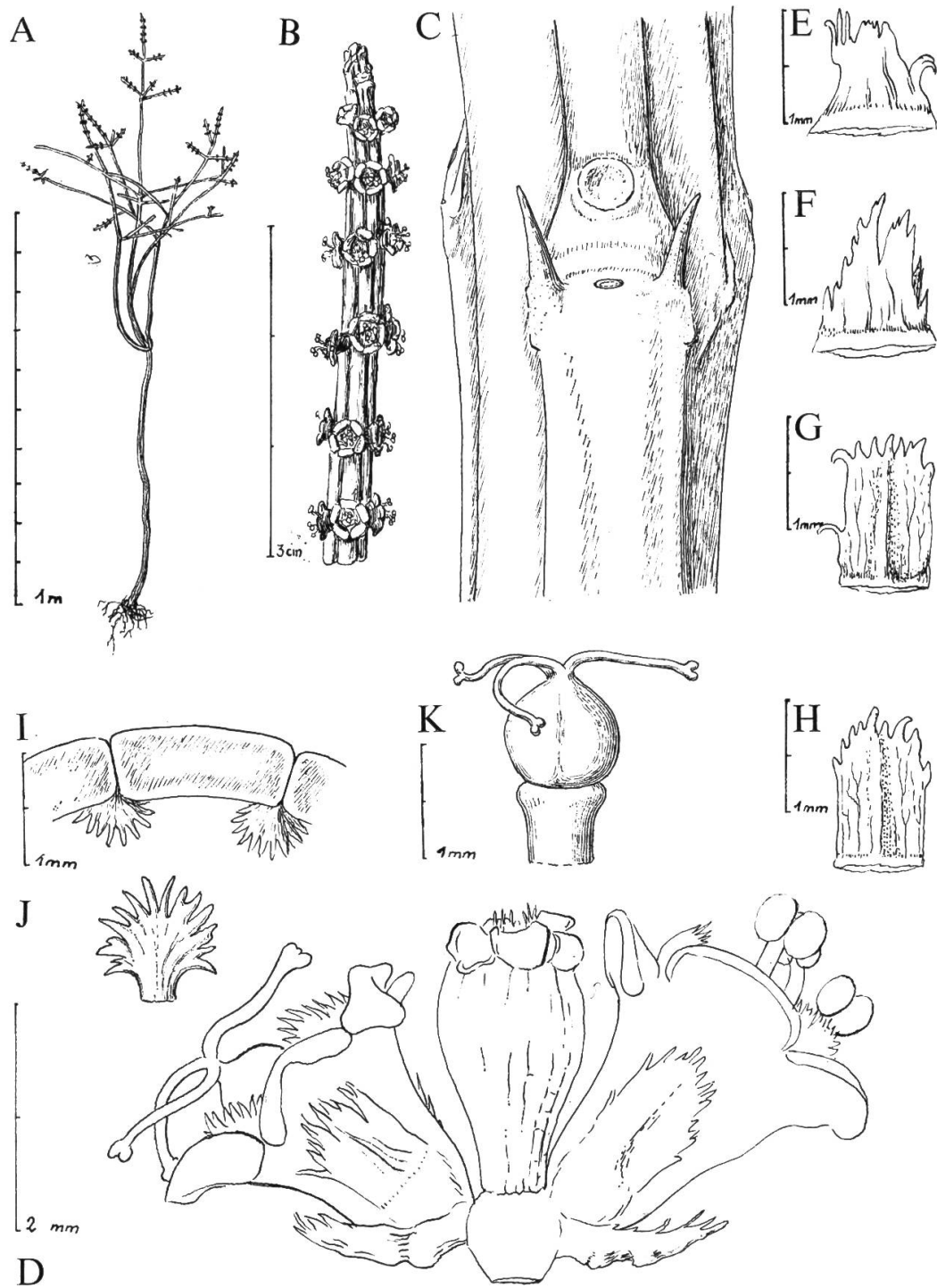


FIG. 97. — *Euphorbia cryptospinosa* Bally

A, mature plant; B, flowering branchlet; C, section of stem showing the spinescence; D, cyme; E, F, primary involucral bracts; G, H, secondary involucral bracts; I, glands with lobes; J, lobe; K, capsule with pistil.

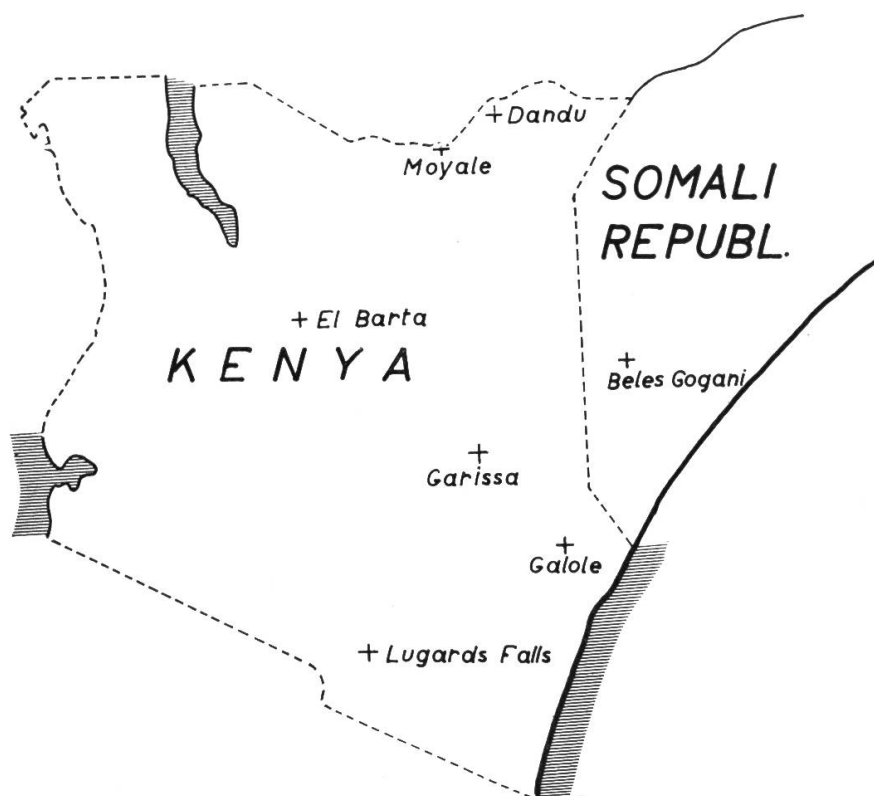


FIG. 98. — Distribution of *Euphorbia cryptospinosa* Bally

in the grooves; spineshields and spines are in no way prominent, leaves are so minute as to remain undetected, and the slender stems and branches climbing into thornbushes are hardly distinguishable from dead twigs. Only in the flowering season the bright red cymes, arranged in concentric rings on the young growths make the plant at all conspicuous. *E. cryptospinosa* is the southernmost species of a small group of scandent Euphorbias and most closely related to *E. erlangeri* Pax from which it is distinct through its much reduced spines and the greater number of angles of the stems and branches.

15. Further notes on *Euphorbia cameronii* N.E.Br.

In Candollea 18: 13.1961 the known distribution of *E. cameronii* was reduced to a comparatively small area in the Somali Republic and its purported discovery in Nyasaland by CAMERON was disclaimed. Since then, more herbarium material and an excellent photograph (f. 99: habitat) of a mature plant (again from the Somali Republic) have come to the writer's notice. The collector, Mr C. F. HEMMING, states that in spite of a thorough search he found only one solitary plant; this bears out my previous remarks about its rarity and the likelihood of the disappearance of the species in the near future caused by overgrazing and consequent changes in its ecological environment.

Based on four authentic localities and on far more adequate material for study than the fragmentary gatherings from which N. E. BROWN described the plant in 1911 a new map of its distribution (see map) and a full description of the species are given below.

It remains to clear up the identity of the type; it cannot have formed a part of *Drake-Brockman's* numbers 1042, 1044 and 1045, collected in 1913, 30 miles South of Bulhar, now in the Kew Herbarium and comparable in every respect with the type material : they reached Kew two years after publication of the species. The type was probably included in an earlier collection of *Drake-Brockman's* who sent specimens from Somaliland from 1905 onwards and who was, during the period under consideration, the only plant-collector in that part of East Africa sending specimens to the Kew Herbarium. As for the type-locality, it must remain obscure, but we may assume that it is to be sought within the limits of distribution of the plant as we know it today.

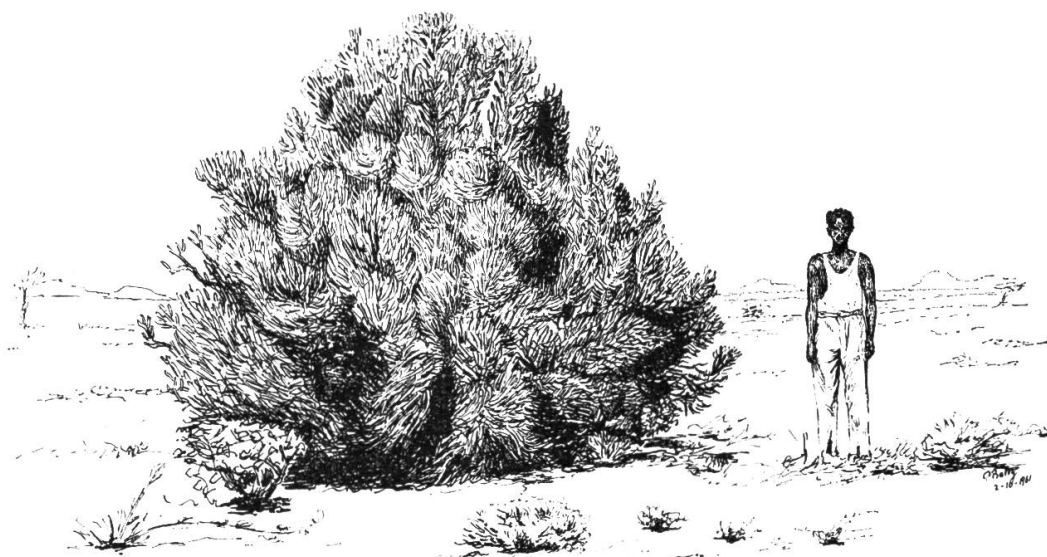


FIG. 99. — *Euphorbia cameronii* N.E.Br., solitary tree in the plain West of the Duberin Pass (from a photograph by C. F. Hemming).

Euphorbia cameronii N.E.Br. *Flor. Trop. Afr.* 6 (1): 554.1911, emend. Bally.

ICON.: This paper, f. 99,100.

Frutex conicus a basi dense multiramosus, glaber, usque 3 m altus, 3.5 m diam. Rami erecto-patentes, 1.5-3 cm crassi, cylindrici, glauco-virides, dense ramulosi; rami primarii 3.5-20 cm longi, 7-9 mm crassi, secundarii 3-9 cm longi, 6-7 mm crassi, apicibus angustatis; cicatrices foliorum vix prominentes, spiraliter dispositae, 0.5-1.5 cm distantes. *Folia* in apicibus ramorum et ramulorum congregata, ante

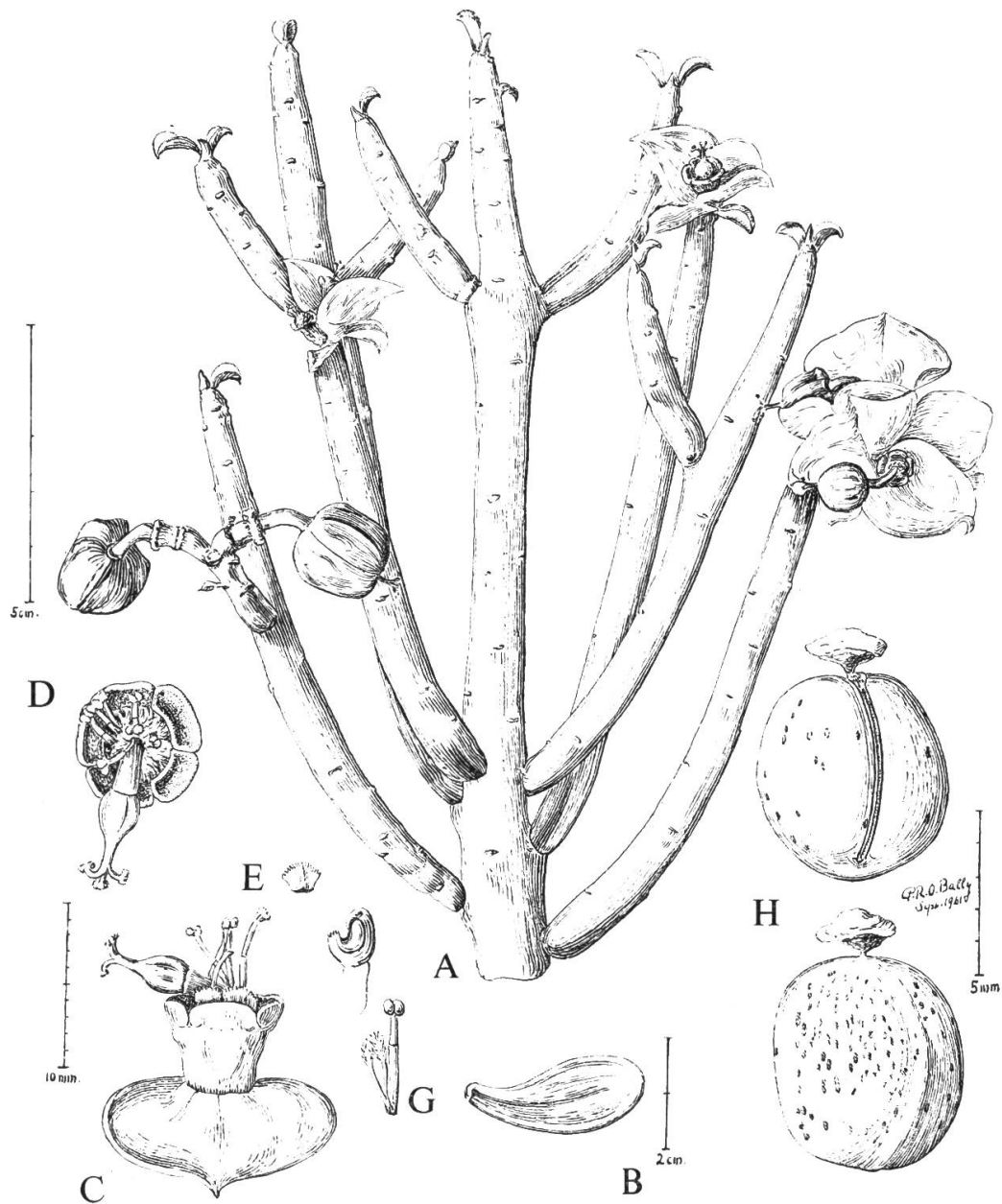


FIG. 100. — *Euphorbia cameronii* N.E.Br.: A, branch; with flowers and fruits; B, leaf; C, involucre with involucre bracts attached; D, involucre, showing lipped glands; E, lobe; F, gland, side view; G, staminate flower; H, seed, ventral and dorsal view.

anthesin decidua, subpetiolata, obovata, in apice obtusa, carnosae, usque 3.3 cm longa et 1.5 mm lata, margine integro. *Bractae* 2-3, verticillatae, transverse ellipticae, longitudinaliter plicatae, in apice acutae, in basi cordatae, in margine integrae, usque 1.5 cm longae et 2.7 cm diametro, albescentes, ex apicibus ramorum et ramulorum ortae foliis jam delapsis. *Involucra* singula seriatim orta, 5.5 mm longa, glandulis inclusis 7 mm diam., cupuliformia, glabra, viridia, deinde flavescentia.

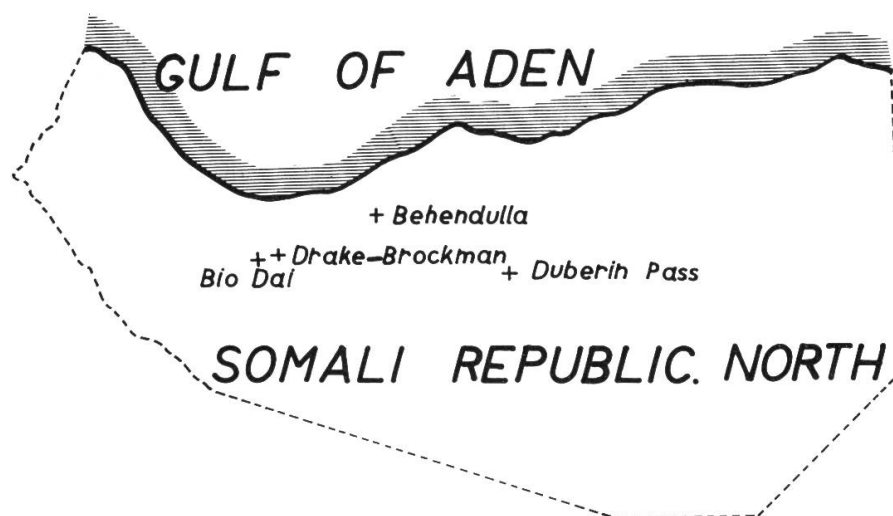


FIG. 101. — Distribution of *Euphorbia cameronii* N.E.Br.

Glandulae obtuse rectangulares, contiguæ, marginibus prominentibus, margine exteriore integro, incrassato, interiore costato. Lobi erecti, spathulati, membranacei, in margine fimbriati, 2 mm diametro, albescentes. Flores masculi numerosi, glabri; pedicelli 5 mm longi; filamenta 2 mm longa; antherarum thecae binae, 1 mm longae, flavae; bracteolae paucae, membranaceae, usque ad basin divisae vel lineares, in apice laciniatae, 5 mm longae. Flos femineus solitarius, pedicellatus, exsertus; pedicellus teres, glaber, usque 15 mm longus, reflexus; perianthium ad marginem minutum, incrassatum, redactum. Capsula dehiscens, obtuse trilobata, basin versus leviter ampliata, breviter carinata, usque 15 mm longa, 16 mm diam., glauco-viridis, rubescens; styli carnosi, $\frac{3}{4}$ connati, erecti, parte libera reflexo-patente, apicibus incrassatis, rugulosis. Semen subglobosum, 6-6.3 mm longum, 5.75-6 mm. diam., albescens, minute spadiceo-maculatum, carunculatum; carunculus breviter pedicellatus, 2 mm diam.

A much-branched, *succulent*, glabrous bush to 3 m high, 3.5 m diam., branching from the base, with a dense, conical crown. Branches cylindrical, erect-spreading, 1.5-3 cm thick, densely branched; primary branchlets 3.5-20 cm long, 7-9 cm thick; secondary branchlets 3-6 cm long, 7-9 mm thick, tapering at their apex; leaf-scars spirally arranged, 0.8-1.5 cm distant, slightly prominent, crescent-shaped, 1-2 mm wide. Leaves terminal, fleshy, obovate, tapering towards the subpetiolate base, apex obtuse, margin entire, caducous. Flowers at the apex of the branches and branchlets, produced from a whorl of 3-5 white, showy involucre bracts, developed after the leaves have fallen. Involucres solitary, each surrounded by a single, large, subfleshy, white, transversally elliptic, longitudinally folded bract to 1.5 cm long and to 2.7 cm diam., apex acute, base cordate, margin entire. Involucre 5.5 mm long, 7 mm diam. including the 5 erect, fleshy glands, cup-shaped, glabrous, green, turning yellow. Glands obtusely rectangular, contiguous, margins raised, outer margin entire, fleshy; inner margin ridged. Lobes erect, membraneous, broadly spathulate, fimbriate, 2 mm high and wide, whitish green. Staminate flowers numerous, glabrous; pedicel 5 mm long, filament 2 mm long; anther-cells paired, 1 mm long, yellow; bracteoles few, divided to the base or linear with a laciniate apex, membraneous, 5 mm long. Pistillate flowers

solitary, pedicellate, exerted on a terete, glabrous pedicel to 15 mm long; perianth reduced to a minute thickened rim. *Capsule* dehiscent, obtusely 3-lobed, broadening and with a short fleshy ridge on each lobe near the base, to 15 mm long, 16 mm diam., glabrous, glaucous-green suffused with pale purplish red; styles stout, 2.5 mm long, united $\frac{3}{4}$ of their length, with reflexed-spreading, bifid, terminally thickened, rugulose tips. *Seeds* subglobose, 6-6.3 mm long, 5.75-6 mm diam., whitish grey with scattered minute pale and dark rufous spots; caruncle shortly pedicellate, 2 mm diam., pale yellow.

DISTR.: SOMALI REPUBLIC NORTH, *Drake-Brockman*, data lost (type K); 30 miles South of Bulhar, 9°58'N, 44°27'E, 700 m, March 1913, *Drake-Brockman* 1042, 1044, 1045 (K); Bio Dai, dry alluvial soil, open scrub with *Commiphora* and *Acacia* shrub, 2 m high, 9°55'N, 44°17'E, 750 m, 19 Oct. 1932, *Gillett* 4342 (K); 1 mile N-W of Behendulla on road to Berbera, 10°13'N, 45°06'E, 750 m, 31 May 1949, *Bally B* 7132 (EA, K, G); *ibid.* on edge of rocky ravine, shrub with profuse latex, 2 m high, 17 Nov. 1954, *Bally B* 10400 (EA, K, G); 32 miles N-E of Burao, on track to Duberin Pass, solitary bush, 3 m. high, in plain, 9°43'N, 45°58'E, 4 Nov. 1960, *Hemming* 2076 (K in spirit only).

