EAST AFRICAN SUCCULENTS.

PART V.

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(DRAWINGS AND PHOTOGRAPHS BY THE AUTHOR.)

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N.O. *ASCLEPIADACEAE*.—CONTINUED.

TRIBE: *CEROPEGIEAE*.

The *Ceropegieae* are allied to the *Stapelieae*.

Succulence is not common in the tribe, and only the genus *Ceropegia* merits description in this paper.

Genus *Ceropegia*.

The distribution of this genus ranges from the warmer parts of China, India, throughout Africa, the Mascarene Islands and to Australia.

In Thiselton-Dyer's *Flora of Tropical Africa*, 4, 1: 390-402 and 620-622 (1904), fifty-nine species are recorded and another fifty have been added since that date; others have also been discovered that have not yet been described.

In habit the East African ceropegias are not very conspicuous and it requires a trained eye to detect them; most of them are slender, trailing or climbing plants, others are erect herbs.

Most species are herbaceous—often with large, underground tubers—others develop succulent stems and leaves; about eleven are recorded as succulent.

A complete survey of the East African species would form an interesting study, but such an undertaking will have to be postponed until after the war, when overseas collections and publications will again be available for consultation.

The present paper is concerned only with the *succulent species* occurring in East Africa.

The *Ceropegieae* are remarkable for their extraordinary flowers which—unlike other flowers—never appear to be fully expanded.

A long, closed, often inflated tube rises high above the corona; this tube terminates in five lobes which are often of considerable length.

PLATE 45.

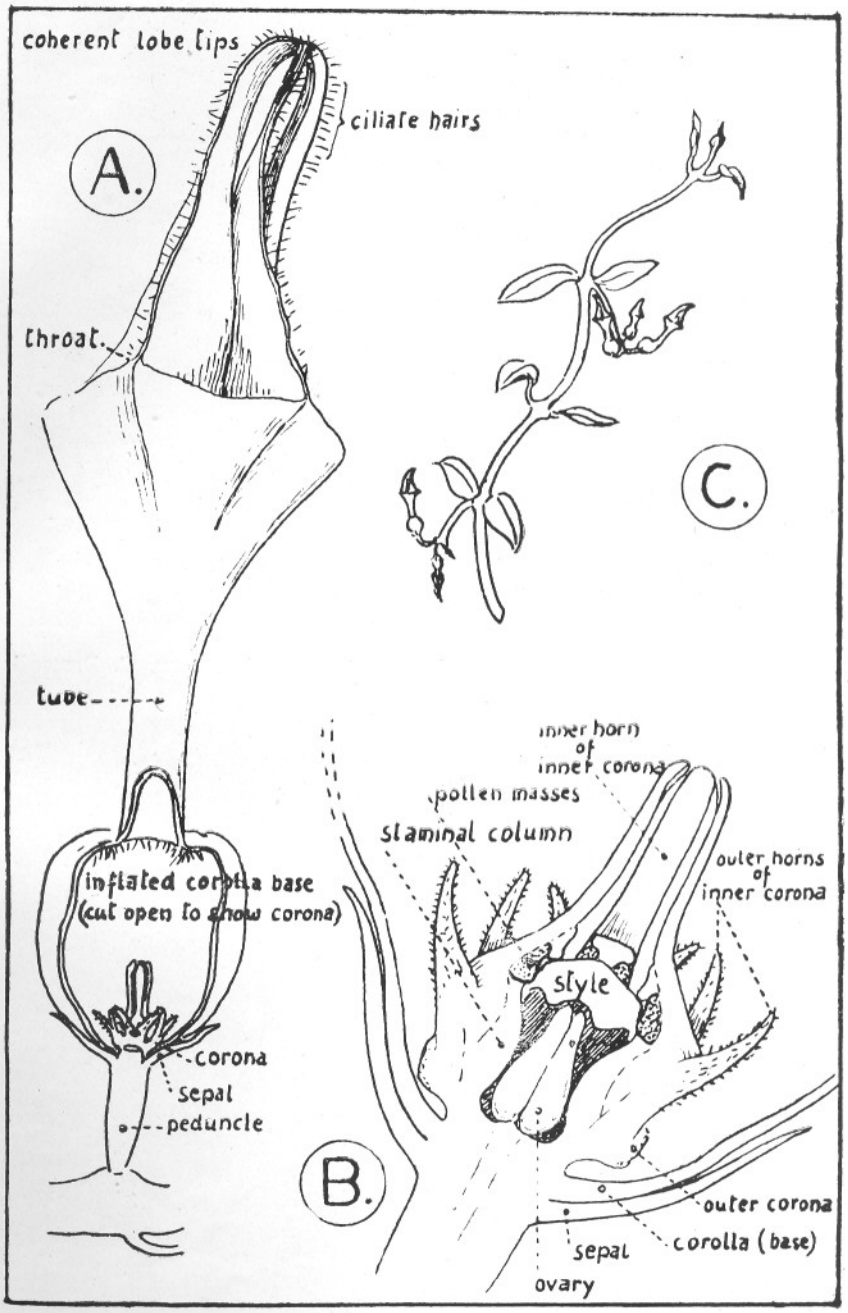

Fig. 1. The parts of a *Ceropegia* (based upon C. Bally S70).

(A) Corolla, with basal part cut open.
(B) Corona, cross section.
(C) Flowering growth.

PLATE 46.

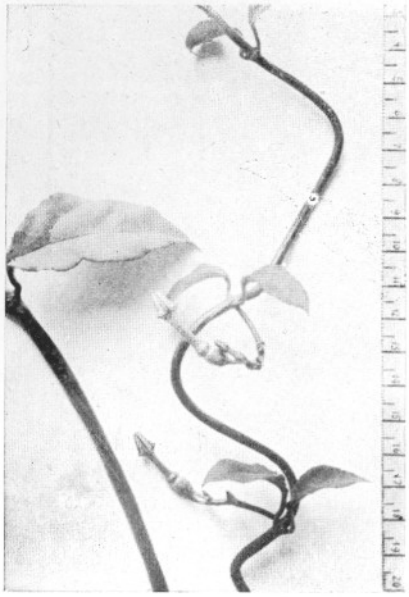

Fig. 2. *Ceropegia mozambicensis* Schlechter.

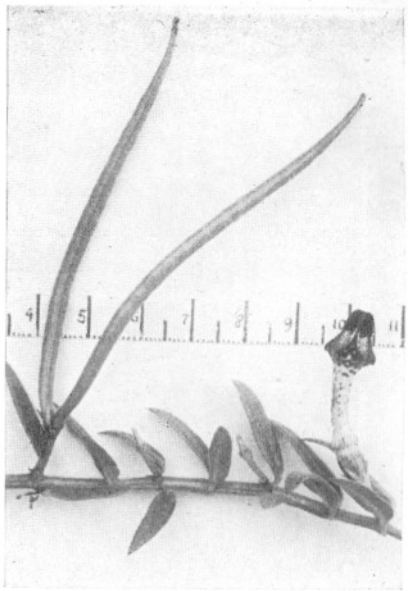

Fig. 3. *Ceropegia* sp. nr. *C. Brownii* Ledger (flower and fruit).

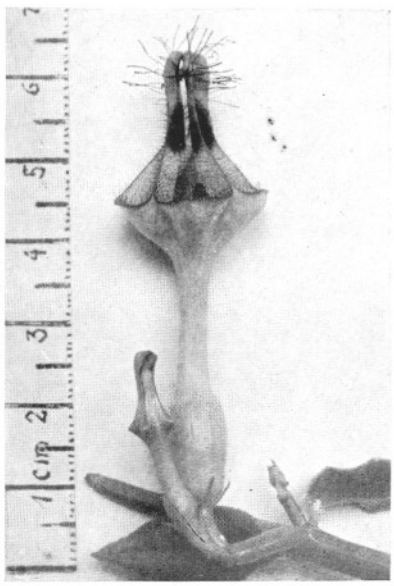

Fig. 4. *Ceropegia* sp. nr. *C. denticulata* K. Schum. (flower).

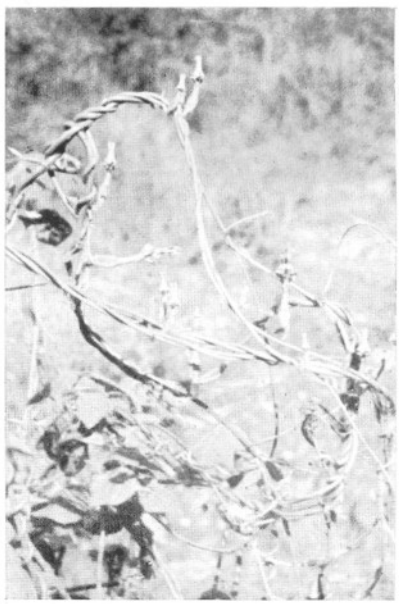

Fig. 5. *Ceroperia* sp. nr. *C. denticulata* K. Schum. (growth).

PLATE 47.

Fig. 6. *Ceroperia* sp. nov.? (Bally S48).

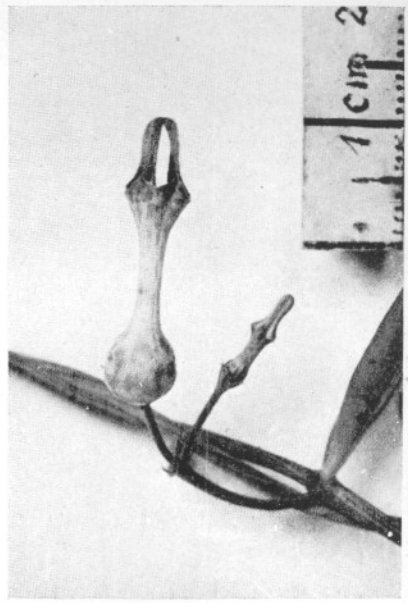

Fig. 7. *Ceroperia* sp. nov.? (Bally S83) (flower).

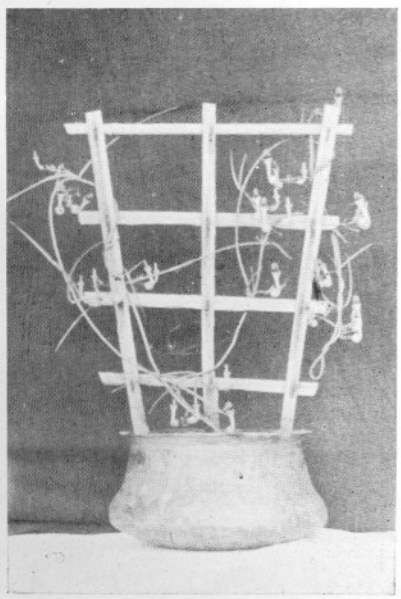

Fig. 8. *Ceropegia* sp. nov.? (Bally S83) (cultivated plant).

Fig. 9. *Ceropegia* sp. n'r. *C. seticorona* E. A. Bruce.

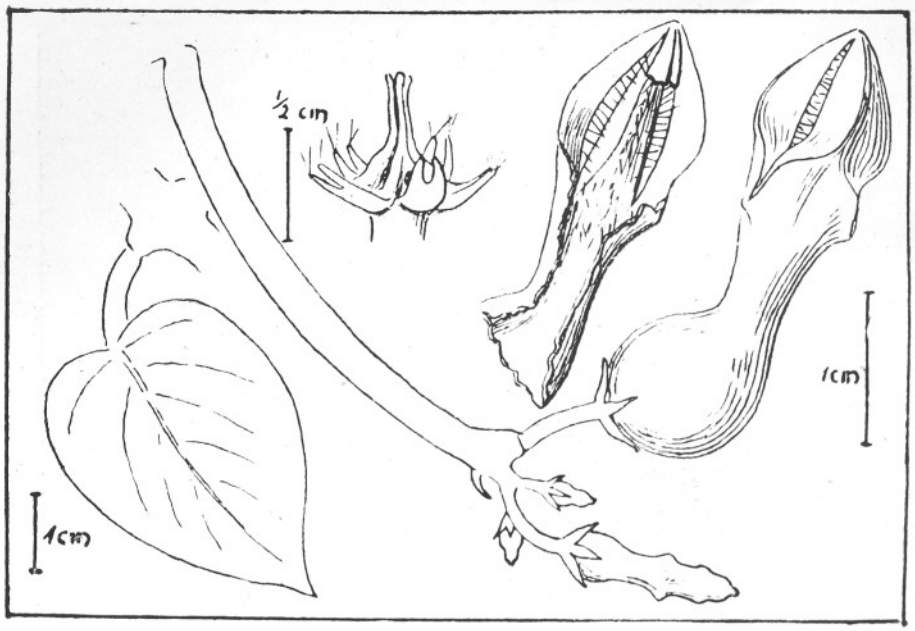

Fig. 10. *Ceropegia* sp. nov.? (aff. *C. seticorona* E. A. Bruce (Bally S72).

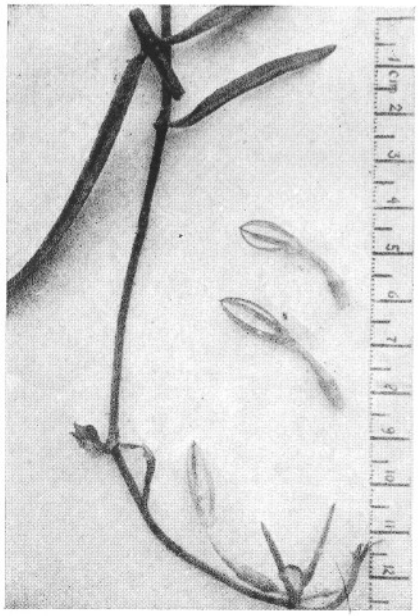

Fig. 11. *Ceropegia stenantha* K. Schum. var. *parvifolia* N. E. Br.

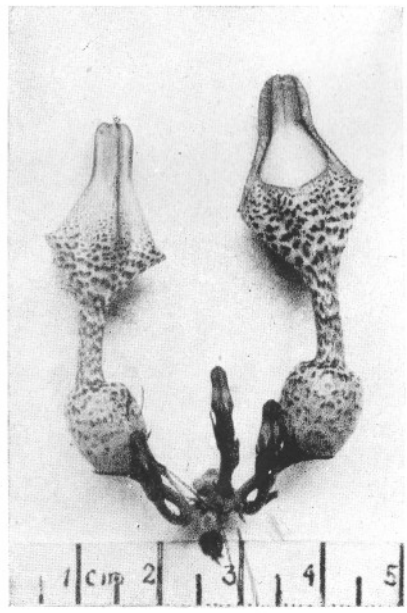

Fig. 12. *Ceropegia succulenta* E. A. Bruce.

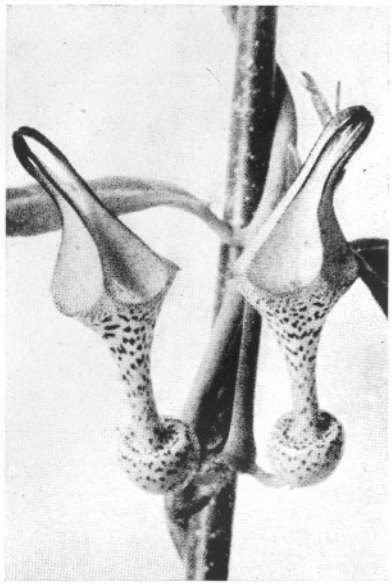

Fig. 13. *Ceropegia* sp. nov.? (aff. *C. succulenta* E. A. Bruce) (Bally S70).

Fig. 14. *Ceropegia* sp. nov.? (Bally S44).

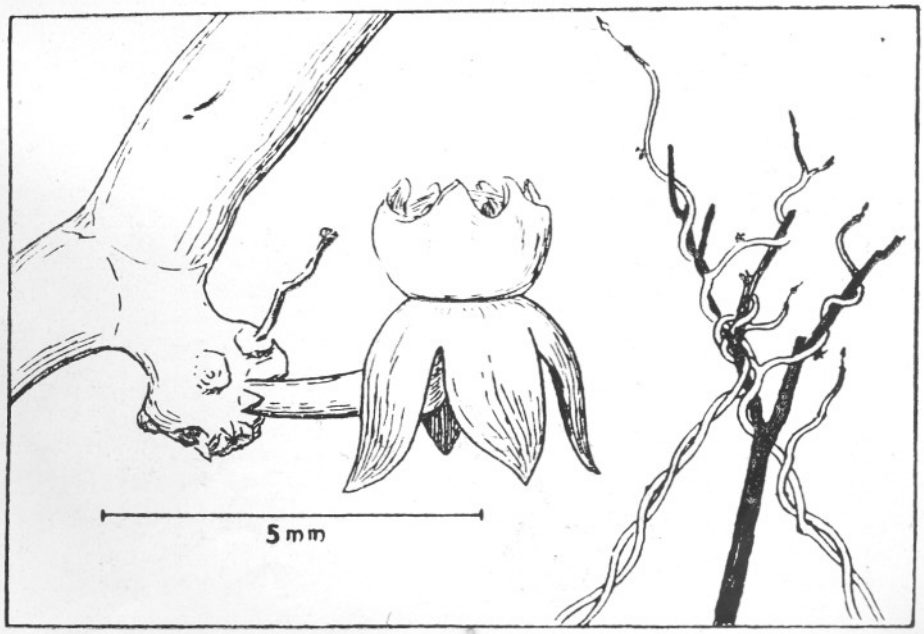

Fig. 15. *Cynanchum sarcostemmatoides* K. Schum.

PLATE 50.

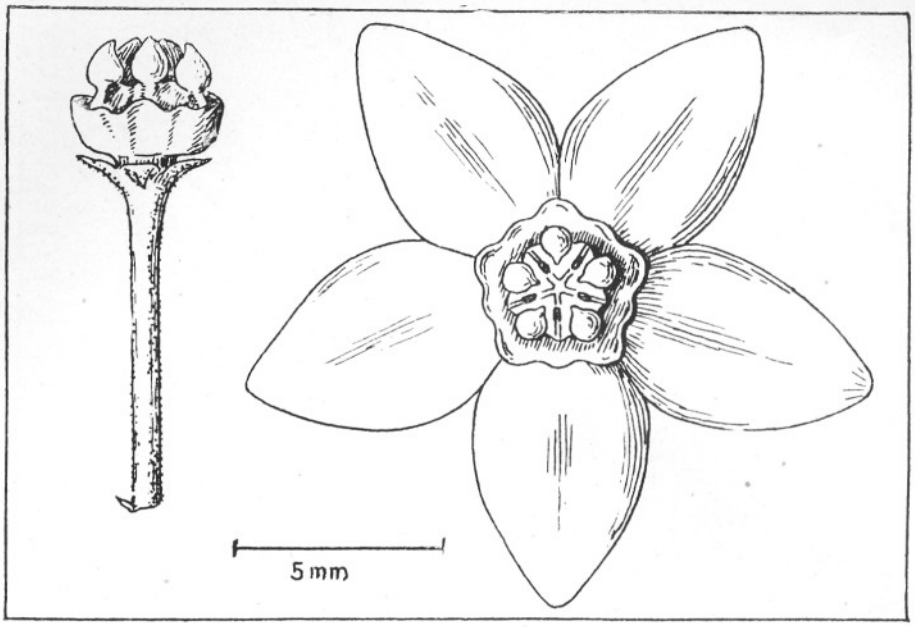

Fig. 16. *Sarcostemma viminale* R. Br.

Fig. 17. *Sarcostemma* sp. nov. (Coryndon Museum No. 4051).

PLATE 51.

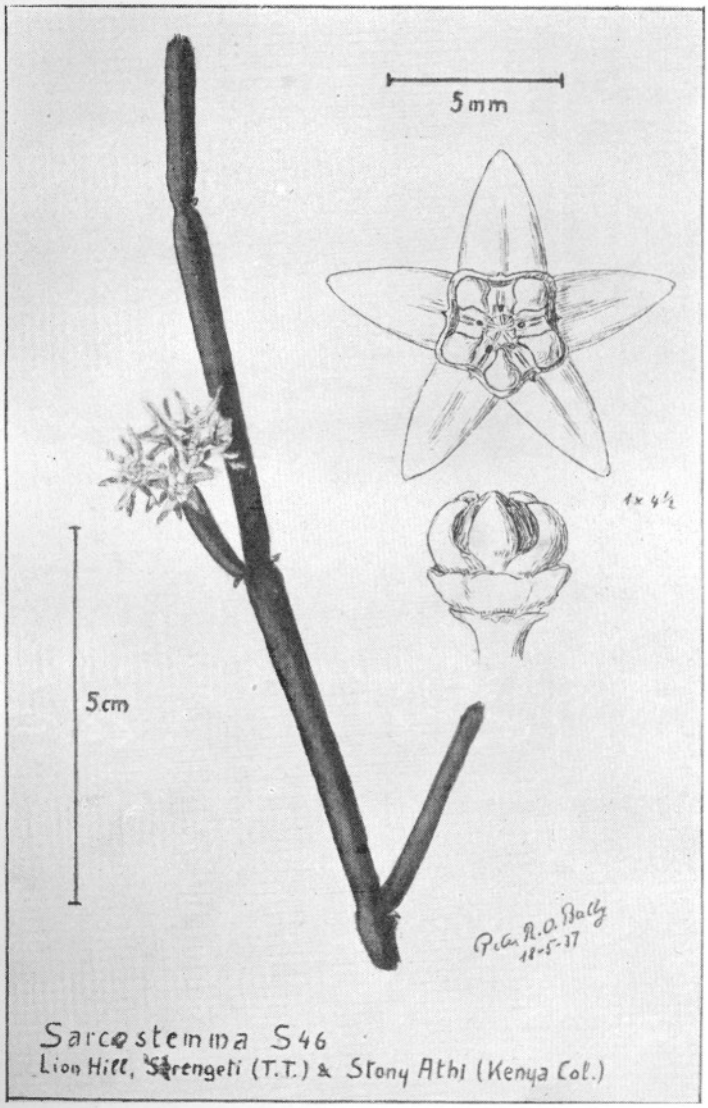

Fig. 18. *Sarcostemma* sp. nov. (Bally S46).

With few exceptions—as in the South African *C. stapelioides* —the lobes are prevented from unfolding and spreading in that their tips remain coherent. Pocket-like apertures at the base of the lobes provide access to pollinating insects to the interior of the tube and down to the corona.

Ciliate hairs are frequently disposed inside the tube and in its inflated base, in such a way that the bristles are pointed downwards and are thus seemingly meant to retain pollinating insects in the neighbourhood of the sexual organs of the flower.

The diagram of the flower of a *Ceropegia* (Plate 45, Fig. 1) will acquaint the reader sufficiently with its structure without necessitating further description.

The fruits are similar to those of the *Stapelieae;* they consist of two parallel or spreading, slender, horn-shaped follicles. (See Plate 46, Fig. 3.)

Some Far Eastern and South African *Ceropegieae* have long been cultivated as hothouse plants for their curious and often quite large flowers, no less than for their attractive foliage. Such are *C. elegans, C. Sandersonii* and *C. Woodii.*

Many of the East African species, in particular *C. Lugardae, C. denticulata* and others—still undescribed—compare well with the best of the cultivated plants.

Ceropegia distincta N. E. Brown.

This little-known plant was sent to Kew by Sir J. Kirk from Zanzibar; it may have been collected on that island or on the adjacent mainland.

It was described from an incomplete specimen. It has probably twining stems and fleshy leaves up to 7½ cm. long and 5 cm. wide, with acuminate tip and with broadly rounded lobes at the base. The corolla tube is about 2½ cm. long and curved at a right angle above the slightly inflated base.

The corona of the specimen is not sufficiently well preserved to allow an accurate description.

Ceropegia mozambicensis Schlechter.

Stems twining, fleshy, glabrous, with opposite, spreading leaves. Leaf-stalk 6 to 12 mm. long, blade 2 to 4.5 cm. long and 1 to 2 cm. wide, elliptic, with a shortly pointed tip..

Corolla tube about 3.5 cm. long, slightly curved, inflated for nearly half its length and constricted at the middle of the inflated part.

The upper part of the tube opens into a throat about 2 cm. wide. Colour greenish-white, spotted with purple on the outside. Lobes 1 to 1.4 cm. long, triangular, replicate, bulging outwards, set with short hairs on the inner surface, while the edges are set with longer, club-shaped hairs. The tips of the lobes are fused.

Inflorescence two- to three-flowered, axillary, from a common peduncle 1 to 1.2 cm. long.

The distribution of this plant appears to be comparatively wide: it is recorded from the coral cliffs south-east of Mombasa Island in Kenya, from the Kavala Islands in Lake Tanganyika, from the mouth of the Pungwe River in Portuguese East Africa, and from Elisabethville in the Belgian Congo. (Plate 46, Fig. 2 with immature flowers.)

Ceropegia Brownii Ledger.

Closely related to *C. mozambicensis* with which it shares the characteristic constriction of the basal part of the tube, this species has much larger flowers with erect (not bulging) corolla lobes and other differences. It was collected by E. Brown in the Mabira Forest in Uganda.

Ceropegia sp. nr. *C. Brownii* Ledger.

(Coryndon Museum No. 7933.)

A trailing plant with lanceolate, fleshy leaves, 2.5 cm. long and 8 mm. wide.

The flowers are produced singly from the leaf axils on a peduncle 1 cm. long, but which continues to grow—as the fruit develops—to 1.5 cm.

The corolla is 3 cm. long, with a slightly curved tube and a swollen, constricted base. At the throat the tube widens abruptly. The triangular, erect lobes are coherent at the tips. The colour is greenish-white, flecked with purple. The lobes are pale green, with purple tips and edges, the green parts with purple spots which become denser towards the throat.

The edges and the inside of lobes and throat are set with purple hairs.

The plant occurs near Kibwezi, at the foot of the Chyulu Hills, Kenya Colony, at 3,500 feet altitude. (Plate 46, Fig. 3.)

Ceropegia denticulata K. Schum.

Stems twining, fleshy, glabrous. Leaves subsessile or shortly petiolate, 3.5 cm. long, 10 to 12 mm. broad, fleshy, ovate or subrhomboidal, tapering at both ends and denticulate at the apex. Peduncle two-flowered.

Corolla about 4 cm. long, whitish, with blackish-maroon spots, glabrous outside. Tube 3 cm. long, moderately inflated at the base. Mouth broadly funnel-shaped, 10 to 20 mm. in diameter, ciliate. Lobes 10 mm. long, linear, erect, connate at the tips, pubescent, ciliate with long, vibratile, clavate hairs.

The plant is related to *C. mozambicensis* and to *C. Brownii*, but the inflated part lacks the constriction.

It was collected by Holst in Silai, in Tanganyika Territory.

Ceropegia sp. nr. *C. denticulata* K. Schum. (Bally 545.)

The main feature which distinguishes this plant from the former is the greater length of the corolla lobes which measure 1.5 to 2 cm.

This, however, may be a variable character, and more material is required from the type and other localities to settle this point.

The colour of the corolla varies from an almost uniform green, with a band of maroon across the lobes which have purplish-maroon edges and purplish-maroon vibratile and clavate hairs, to a dense maroon mottling over the entire surface of the tube.

The plant is one of the most attractive ceropegias.

It is a very common climber over bushes in the rocky river-beds near Nairobi, and in the forests of Langata, Karura, and Ngong, between 5,400 feet and 6,000 feet altitude. (Plate 46, Figs. 4 & 5.)

Ceropegia sp. nov.? (Bally S48.)

A scandent herb with a flat, disc-shaped tuber to 5 cm. in diameter.

From the tuber a single stem is produced, erect in the young plant, but assuming a semi-scandent habit if given support. Stems slender, not fleshy.

Leaves rhomboid, mucronate at both ends, very fleshy, shortly pedicellate, 2.5 cm. long and 16 mm. broad. One to two flowers are produced axillary on short peduncles, 2.5 mm. long.

Corolla 16 mm. long with globose swollen base, 5 mm. wide. The curved tube is 5 mm. long and 2 mm. wide, spreading at the throat to 5 mm. The narrow lobes, edged with vibratile hairs, are 4 mm. long and cohere at the tips.

The inner wall of the corolla base is set with rows of very small blister-like glands. Numerous minute Diptera were found trapped inside.

The outer corona lobes form an almost perfect cup with an undulate margin, 1 mm. high. The inner corona lobes are erect, linear, curved outwards at the tips, 2.5 mm. long.

The plant was discovered by Mrs. H. Copley in Nairobi, Hill District, on black soil, 5,400 feet altitude, in June, 1940. (Plate 47, Fig. 6.)

Ceropegia sp. nov.? (Bally S83.)

In habit very similar to the plant described above, it is readily distinguished by the linear leaves, reduced to scarcely more than the fleshy midrib. The stems, erect when young, later become trailing and sparsely branched; but are rarely more than 45 cm. long.

The inflorescence is axillary; from a peduncle 10 mm. long five and more flowers are produced consecutively.

Corolla 24 mm. long with spherically inflated base, 5.25 mm. wide. The curved tube is 2 mm. wide, opening into a throat 5 mm. wide. The replicate, narrowly triangular lobes are 5 mm. long and cohere at the tips. The inner edge of the lobes and

the inner surface of the tube are covered with very thin vibratile hairs. The swollen base is glabrous.

Base and lower part of tube are greenish-white with faint maroon spots.

The throat is dark maroon, the lobes green, tipped with maroon.

The corona is 3 mm. in diameter. The outer corona lobes are spatulate, slightly pointed in the middle and flanked by two very short horns; the inner lobes are erect, 2.5 mm. long. In the mature flower, the inner lobes spread outward. The corona is white.

The plant is common in Onjiko near Kisumu, Kenya Colony; it is called "ongei" by the Luo, who eat the tuberous roots. (Plate 47, Figs. 7 & 8.)

Ceropegia seticorona E. A. Bruce. (Coryndon Museum No. 7319.)

A climbing plant with slightly fleshy leaves. This species is characterized by the long peduncle at the apex of which five to eight long, pedicellate flowers are borne. The corolla has a cylindrical, slightly curved tube, scarcely inflated at base and throat. The lobes are very slender, coherent at the tips and giving the appearance of a bird's beak. The outer corona lobes are forked, the two horns being broadly triangular and spreading, tipped with one or two long bristles (the "bristle-coronaed" *Ceropegia*) and thinly hairy at the base.

The inner lobes are much longer, narrowly linear and hooked at the tips.

The corolla is of a nearly uniform pale green.

The plant was discovered by the writer near Namanga, on the Kenya-Tanganyika border, at 3,600 feet altitude, in *Commiphora* bush, in April, 1938.

Ceropegia sp. nr. *C. seticorona* E. A. Bruce. (Bally S74.)

This climber differs from *C. seticorona* by the fleshier and entirely glabrous leaves, the slightly larger flower which is greenish-yellow, flecked with maroon along the tube, and has uniformly maroon lobes.

The narrow portion of the tube is covered inside with a fringe of pink hairs. The corona shows no marked difference from that of *C. seticorona.*

It was discovered by Mrs. Joy Bally in Kasindi, Belgian Congo, in December, 1939. (Plate 47, Fig. 9.)

Ceropegia sp. nov.? (aff. *C. seticorona* E. A. Bruce). (Bally S72.)

This fleshy climber is closely allied to the above species. Its corona with bifid, outer lobes set with sparse, stiff bristles and with its slender, long, inner lobes resembles *C. seticorona.*

The fleshy leaves are slightly lobed at the base; they are to 4 cm. long and 3 cm. wide, on a stout pedicel about 1.5 cm. long.

The corolla is 3 cm. long with a curved tube and a spherically inflated base. The corolla lobes are deeply cut, about 1.5 cm. long, replicate and rounded at the tips. The tips are coherent. The inner surface of the lobes and of the upper portion of the tube are covered with short, bristle-like hairs. The colour of the flower is described as greenish-yellow to buff.

The plant occurs in the Garabani Valley near Sultan Hamud in Kenya Colony, at 4,500 feet. It was discovered by Dr. V. G. L. van Someren in March, 1940. (Plate 48, Fig. 10.)

Ceropegia stenantha K. Schum. *var. parvifolia* N. E. Brown.

This very graceful *Ceropegia* is a climbing plant with long, linear, slightly fleshy leaves. The delicate flowers grow in umbels. The corolla tube is curved with a slightly swollen base. The lobes are linear, sharply replicate, separated from their base and coherent at the tips. The length of the corolla is 3.5 cm. The colour is green.

The outer corona consists of five small pouches alternating with the anthers. The inner corona lobes are erect, 1 mm. long.

The variety has a fairly wide distribution; it is recorded from Rhodesia and from Tanganyika Territory. In Kenya Colony, it occurs at the foot of the Chyulu Hills, at approximately 4,000 feet altitude, where it was collected by the writer. (Plate 48, Fig. 11.)

Ceropegia succulenta E. A. Bruce.

One of the showiest East African ceropegias. It is a large-flowered, succulent climber with oblong-elliptic, fleshy, variegated leaves.

The pedicellate leaves are to 6 cm. long and 4 cm. wide. They are glabrous, shiny, dark green with pale whitish-green veins.

The corolla is to 6 cm. long, much inflated at the base, then abruptly contracted into a narrow tube and finally widely expanded at the throat.

The lobes cohere at the apex; they are more or less triangular in shape and folded back so that the margins nearly touch.

The inflated base and tube are ivory white dotted with circular maroon spots. The lobes are greenish, edged with maroon and covered with minute maroon hairs.

The corona is cup-shaped at the base and thinly puberulous, the outer lobes are deeply bifid and rather shorter than the entire inner ones.

This beautiful plant was discovered in Kiambu, at 5,400 feet altitude, by Miss Evelyn Napier, formerly Botanist at the Coryndon Museum. It has since been found to be common in other forests in the neighbourhood of Nairobi. (Plate 48, Fig. 12.)

Ceropegia sp. nov.? (aff. *C. succulenta* E. A. Bruce). (Bally S70.)

Although very similar in habit as well as in the flowers, the growth of this plant is more robust, the leaves are slightly larger, and the corolla measures to 7 cm. in length.

The corolla lobes are considerably longer, linear towards the tips and curved to one side.

The base is compressed globose, with the narrow tube sunk into it.

The colouring is similar to that of *C. succulenta,* but the purplish-maroon spots on the tube are smaller, and the lobes are tipped with dark maroon.

The outer corona lobes are more deeply bifid and slightly shorter than those of *C. succulenta.*

It was collected by Dr. V. G. L. van Someren on Emali Hill near Sultan Hamud, Kenya Colony, at 5,500 feet altitude, in March, 1940. (Plate 49, Fig. 13.)

Ceropegia sp. nov.? (Bally S44.)

The erect, non-scandent habit of growth, the very narrow openings between the corolla lobes and the short inner corona lobes are distinctive in this species.

It is a much-branched plant, about 30 cm. high with a tuberous root. The stems are fleshy, to 6 mm. thick, the internodes 1 to 1.5 cm. long. The linear leaves are fleshy, up to 8 cm. long and 7.5 mm. wide with slightly wavy margins.

The inflorescence is axillary and consists of few-flowered racemes to 4.5 cm. long.

The corolla is 18 mm. long, slightly inflated at the base, the tube 3 mm. wide, expanding to 7 mm. in diameter at the throat. The rounded corolla lobes are only slightly replicate, leaving a narrow, slit-like opening between them; they are 4 to 5 mm. long and cohere at the tips. The corolla is glabrous outside; the inner surface of the lobes and of the non-inflated part of the tube is set with minute, bristle-like hairs.

The corona is 2.25 mm. in diameter. The outer lobes are rounded, with two much-reduced horns, minutely puberulous. The inner lobes with a length of 0.75 mm. just subtend the staminal column. Corolla and corona are green.

This interesting plant was discovered by Mrs. K. Armstrong in Kiambu, Kenya Colony, at 6,000 feet altitude, in March, 1941. It occurs also in Nairobi. (Plate 49, Fig. 14.)

TRIBE: *CYNANCHEAE.*

Out of the twenty genera included in this tribe, only two need concern us.

Genus *Cynanchum*.

Only one succulent species is known from East Africa.

Cynanchum sarcostemmatoides K. Schum.

As indicated by its name: the "fleshy-festooned" *Cynanchum*, this plant is a twining, succulent, climber which grows over bushes and forms festoons over their branches.

From a fibrous rootstock sparse ascending and trailing, much-branched stems are produced. They root readily at the nodes.

The branches are 1.5 to 3 mm. thick with nodes up to 15 cm. apart. Leaves scale-like, 3 mm. long and 1 mm. wide at the base, soon deciduous.

The flowers are produced in few-flowered umbels from sub-lateral tubercles. They develop in sequence and as a rule no more than two or three flowers mature simultaneously. The pedicels are stout, glabrous, 2 to 3 mm. long.

The five-lobed corolla, reflexed in the mature flower, is green, streaked with maroon; the corolla lobes are 5 mm. long and 1.75 mm. wide at the base.

The five-toothed corona is bell-shaped with the teeth subtending the staminal column; it is 2.35 mm. wide and 1.8 mm. high and pure white in colour.

The plant is found all over East Africa under dry conditions from sea-level up to 5,000 feet altitude. (Plate 49, Fig. 15.)

Genus *Sarcostemma*.

The members of this small genus are fleshy-stemmed, leafless plants of bushy or climbing habit and resemble some species of *Euphorbia*.

The F.T.A. (1902) records only two species, but it suggests that more species may exist and that study of the living plants might show up specific differences which are not evident in herbarium material.

Observations of plants in the field and in cultivation in Nairobi have indeed shown that—although the structure of the flowers is remarkably uniform—in habit at least four well-defined species occur in East Africa.

Sarcostemma viminale R. Br.

A many-stemmed, scandent shrub with tuberous roots and with numerous slender, whip-like stems which trail or climb over bushes. The branches are dark green, glabrous, turgid with a white latex. They are 5 to 6 mm. thick at the base, the young shoots 2 mm. thick or less. The nodes are 15 cm. or more apart. Stems trailing along the ground root at the nodes.

The leaves are reduced to very minute scales which are soon deciduous.

The stems are sparsely branched; unforked branches are often 100 cm. or more in length.

The flowers are produced in sessile umbels, terminal, or lateral at the nodes. They are pedicellate, the pedicel 5 to 6 mm. long, slightly puberulous.

Thirty or more flowers have been counted on one umbel.

The five-lobed corolla measures about 18 mm. in diameter; it is greenish-white to sulphur-yellow, with its lobes more or less reflexed at the margins.

The outer corona is cup-shaped with a wavy margin; the inner corona consists of five erect lobes, compressed at the base and with pointed tips, adpressed against the backs of the anthers. The corona is pure white.

The flowers are very sweetly scented.

The distribution of *S. viminale* is very wide. It is found on dry rocky ground and on sandy soil all over East Africa, from sea-level to about 6,000 feet altitude. (Plate 50, Fig. 16.)

Sarcostemma sp. nr. *S. andogense* Hiern.
(Coryndon Museum No. 6621.)

In habit similar to *S. viminale*, this plant is much more robust in all its parts. Fresh stems are 10 to 12 mm. thick, with their nodes 12 to 15 mm. apart. The terminal shoots are 3 to 4 mm. thick. The growth is stiffer and more straggly. The surface of the stems is a pale, glaucous green and it is covered with a creamy-white tomentum which is noticeable particularly on young shoots. The flowers are slightly larger in diameter, but so similar in structure to those of *S. viminale* that a specific differentiation is hardly possible. They are disposed in pedicellate, terminal, sometimes lateral, many-flowered umbels. They are greenish-white in colour and sweetly scented.

The distribution of this species is wide in Kenya Colony and in Tanganyika Territory, but it is confined to lower altitudes and drier localities than is the case with *S. viminale*.

Sarcostemma sp. nov. (Coryndon Museum No. 4051.)

This plant can be readily distinguished by its short, tufty growth which gives it the aspect of being continually browsed back by cattle. The fresh branches are 8 mm. thick, terete, with the nodes set very close, 1 to 3 cm. apart.

The terminal shoots are 1.5 mm. thick. The numerous stems which are produced from a fibrous to tuberous rootstock are much-branched and covered with a very slight greyish-white tomentum.

The trailing branches root readily from the nodes and soon develop new plants, one plant soon covering an area of a square yard or more.

The flowers are produced in terminal and in lateral umbels of numerous, pedicellate, sweetly scented flowers. The corolla is reddish-brown, tinged with green with its five lobes sharply reflexed. The corona, very similar to that of the foregoing species, is pure white.

The plant is common in the Kenya Highlands on rocky ground and in pasture land on well-drained soils.

It was first collected by Mrs. Brodhurst-Hill in the Soy District, at 5,000 to 6,000 feet altitude. (Plate 50, Fig. 17.)

Sarcostemma sp. nov. (Bally S46.)

The smallest and the most delicate of the East African species, it produces only a few, tin, sparsely-branched stems and a weak, fibrous root system.

The branches are 3 to 4 mm. thick with the nodes 4 to 7 cm. apart. They are of erect habit until they are more than 15 cm. high, when they develop a procumbent habit, and root at the nodes. They grow seldom more than 30 cm. long.

The inflorescence consists in lateral umbels of four to seven flowers.

The corolla is 10 mm. in diameter with lobes 3.5 mm. long, replicate, and of a vivid mauve.

The outer corona is cup-shaped, 1 mm. high and it encloses the inner corona more tightly than it does in the species mentioned before.

The inner corona lobes are not compressed at their base.

The attractive little plant was discovered on Lion Hill in the Serengeti Plains in Tanganyika Territory, by Dr. W. Klett, in 1935. It has since been found on rocky outcrops in the bottom of Ngorongoro Crater, and in Kenya Colony near Stony Athi, at 5,000 feet altitude, on black soil and on Mt. Susea, 5,500 feet, on old lava flows. (Plate 51, Fig. 18.)

This concludes our account of East African succulent *Asclepiadaceae*.

(TO BE CONTINUED)