

## Stapeliaceae (Asclepiadaceae) from South Tropical Africa: VII

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### ABSTRACT

The identity of typical *Caralluma caudata* N.E. Br. is discussed; two subspecies are recognized, one of which, subsp. *rhodesiaca* Leach, is described here, and details of their synonymy, variation and distribution are given. Two putative intergeneric hybrids, with *C. caudata* one parent, are assumed and from the evidence submitted the identity of one of these with *Stapelia tarantuloides* R. A. Dyer is adduced.

***Caralluma caudata* N.E.Br.** in Fl. Trop. Afr. 4: 485 (1904); Berger, Stap. u. Klein.: 88 (1910); White & Sloane, Stap. ed. 2, 1: 348, 3: 1155 (1937); Jacobsen, Handb. Succ. Pl. 1: 242 (1960) et Sukk. Lexikon 108 (1970). Type: Malawi (Nyasaland), Namasi (Namadzi), Cameron 25 (K!).

Chromosome number:  $2n = 22$ .

Although the variations in the precise size and shape of the corolla and corona lobes of this showy, albeit most malodorous, species repeat the pattern found in most members of the genus, two quite distinct subspecies may be recognised. One, the typical, rare except in the Mbala (Abercorn) region, appears to be restricted mainly, if not entirely, to the northern parts of the Zambesi basin; the other seems to be distributed solely to the south of that river and extending into the Sabi and Limpopo catchment areas is possibly the most widespread and common stapeliad in Rhodesia.

The two taxa are distinguished mainly by their vegetative characteristics and are easily recognized by the colour of their stems, which in subsp. *caudata* are olive to dark olive-green, sometimes appearing to be brownish or purplish from the markings and crowded specklings with which they are often covered. Those of

subsp. *rhodesiaca* are pale greenish grey to greyish green, usually with purplish red markings, and differ from those of the typical subspecies, perhaps even more significantly, in the length of their tapering stem teeth which are, on average, about twice as long as those of its relative. The flowers of subsp. *rhodesiaca* are also generally paler in colour and are often more markedly pubescent, while the spots on the disc are seldom so crowded as to appear as solid colour, as is more usual in subsp. *caudata*. However, these corolla characters are, like those of the corona, subject to considerable variation and flowers as dark as those of the typical subspecies are not unknown from Rhodesia. Subsp. *rhodesiaca* generally flowers earlier than subsp. *caudata* and in fewer flowered umbels, with flowers opening in a more widely spaced succession, so that it is seldom that more than two are open at a time in any one inflorescence. In the typical subspecies, on the other hand, flower development occurs more nearly simultaneously, with the result that umbels with 5-6 open flowers are by no means uncommon.

Despite their discrete distributions and although so readily distinguished from each other, it is considered that subspecific status is most appropriate for these two taxa in view of their almost identical floral characteristics.

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FIG. 1.—*Caralluma caudata* subsp. *caudata*. Plant from Mbala, Zambia, cult. Nelspruit (14883).



subsp. *caudata*

*Caralluma longecornuta* Croizat ex Gomes e Sousa in Rev. Moçambique 4: 44 (1935) et 6: 20 (1936); White & Sloane, op. cit. 1: 35 (1937), nom. nud. Type: Mozambique, Niassa Distr., Mandimba, *R. da Torre* 4 (COI! PRE!).

*Caralluma praegracilis* Oberm. in White & Sloane, op. cit., 3: 1161 (1937); Luckhoff, Stap. S. Afr.: 56, 57 (1952); Jacobsen, Handb. Succ. Pl. 1: 253 et Sukk. Lexikon 114 (1970), p.p. excl. distrib. Rhodesia. Type: Zululand, Nongoma, *Gerstner* 752.

*Caralluma caudata* N.E. Br. var. *fusca* Luckhoff in White & Sloane, Stap. ed. 2, 3: 144 (1937); Luckhoff, Stap. S. Afr. 53 (1952); Jacobsen, Handb. Succ. Pl. 1: 243 (1960) et Sukk. Lexikon 108 (1970). No type cited, locality unknown.

In the absence of material, this variety is assigned to this subspecies on the evidence of the photograph in White & Sloane, l.c., Fig. 287, and is placed in synonymy as it is considered probably to be merely a slight colour variant caused by the spots becoming more or less confluent over the whole corolla rather than this being restricted to the disc.

Chromosome number:  $2n=22$ . *Leach & Brunton* 10078 (SRGH).

It is perhaps unfortunate that the type specimen of *C. caudata* originated from an area where the species seems to be of such rare occurrence: since Cameron's original gathering from Namasi (modern spelling Namadzi), which lies about half way between Blantyre and Zomba, it appears from the records to have been collected only once in Malawi (*Reynecke* 30). Dr. *Reynecke*'s plant appears to be a good match for the type material and is certainly identical with those from around Mbala and adjacent parts of Tanzania. It is among these latter that examples occur which appear to be identical in all respects with the plant described as *C. praegracilis*, and to which White & Sloane l.c. referred as being common in Rhodesian garden rockeries. It seems quite possible that these cultivated plants originated from Mbala; certainly they are equally disease resistant and tolerant of heavy rainfall. It is considered that the Reverend *Gerstner*'s specimen may well have been an escape from similarly cultivated garden plants, especially as the species appears never to have been again collected in Natal.

The specimen from Mandimba in northern Mozambique (provisionally named *C. longecornuta* by Croizat) does not, unfortunately, include stems, but the flowers appear to match those of the type, especially

in respect of the "T"-shaped outer coronal lobes; it is therefore, and in conformity with the distributional evidence, considered to belong here.

TANZANIA.—T4: Ufipa Distr., near Zambian border on Mbala-Sumbawanga road, granite slope in association with *Aloe mziimbana* Christian, cult. Greendale & Nelspruit, *Leach & Brunton* 10078 (BM; BOL; BR; K; LISC; PRE; SRGH; ZSS); ibid. cult. PRE 15872, *Morony* s.n. (PRE).

ZAMBIA.—N: Mbala Distr., Nchalanga Hill near Mbala, cult. & fl. at Nelspruit, *M. Richards* s.n. sub *Leach* 13296 (K; NDO; PRE; SRGH); ibid. *Morony* s.n. sub *Plowes* 3705 (K); near Mbala, cult. Nelspruit, *Whellan* s.n. sub *Leach* 12165 (BOL; LISC); ibid. cult. SRGH, fl. 26.iv.1972, *Whellan* s.n. sub *Leach* 14883 (SRGH); ibid. cult. SRGH 4699 *G. Williamson* s.n. (M; NBG).

MALAWI.—C: Lilongwe, cult. PRE, fl. Apr. 1954, *Reynecke* 30 (PRE; SRGH); Namasi, fl. April 1899, *Cameron* 25 (K).

MOZAMBIQUE.—N: Niassa Distr., Mandimba, fl. Jan. 1937, *R. da Torre* 4 (COI! PRE).

RHODESIA.—Origin unknown, common in cult., fl. 27.ii.1958, *Leach* 5445 (SRGH), idem, fl. 7.iv.1960, *Leach* 9834 (SRGH).

subsp. *rhodesiaca* *Leach*, subsp. nov.

*Caralluma chibensis* Luckhoff in S. Afr. Gardening & Country Life 25: 56 (1935). Type: Rhodesia, Chibi, *Miss Jackson* in Herb. Luckhoff 182.

*Caralluma caudata* var. *chibensis* (Luckhoff) Luckhoff in White & Sloane, Stap. ed. 2, 1: 352 (1937); Luckhoff, Stap. S. Afr. 53 (1952); Jacobsen, Handb. Succ. Pl. 1: 243 (1960) et Sukk. Lexikon 108 (1970). Type: as above.

*Caralluma caudata* var. *stevensonii* Oberm. in White & Sloane, op. cit. 3: 1156 (1937); Jacobsen, op. cit. 1: 243 (1960) et tom. cit. 108 (1970). Type: "near Salisbury", No. 34947 in Herb. Transv. Mus.

*Caralluma caudata* var. *milleri* Nel in White & Sloane, op. cit. 3: 1158 (1937); Luckhoff, op. cit. 54 (1952); Huber in Prodr. Fl. S-W. Afr. 114: 13 (1967); Jacobsen, op. cit. 1: 243 (1960) et tom. cit. 108 (1970). Type: Angola, Cubango (Okavango) River, *A. H. Miller* 7390 in Herb. Stellenbosch (STE†).

A subspecies typica caulibus viridi-griseis vel griseo-  
viridibus; caulium dentibus plus minusve 2-plo longioribus; floribus plerumque pallidioribus, plus pubescentibus facile distinguenda.

TYPE: Rhodesia, S: Belingwe Distr., *Leach*, *E. J. & W. Bullock* 13145 (BM; BOL; BR; K; LISC; PRE; SRGH, holo.; ZSS).

Chromosome number:  $2n=22$ . *Baker* s.n. sub *Leach* 14123 (SRGH).



FIG. 2.—*Caralluma caudata* subsp. *rhodesiaca*. Plant from Shawanoe River, Mrewa, Rhodesia, cult. Greendale, Salisbury (49396).



As it has not been found possible to trace any of the type specimens involved it is considered advisable to adopt an entirely new epithet for this southerly subspecies in order to ensure that no possibility of error may arise regarding its typification. The several varieties included in the synonymy were based by their respective authors on minor variations apparently in single individuals. All of these appear to fall within the range of variability to be observed in single field populations, and sometimes, particularly in respect of the shape of the inner coronal lobes, in a single individual, or even in a single flower.

ANGOLA.—Cuando-Cubango Distr., N. bank of Cubango (Okavango) River between Runtu and Nyangana (?Inhangana), *A. H. Miller s.n.* (photo. of a plant in cult. PRE); ? clonotype cult. Umtali, *A. H. Miller* sub *Plowes 2580* (SRGH). The type locality of var. *milleri* was originally recorded as Okavango, S. W. Africa, but it appears that this was an error since, in a letter to Mr. Plowes, Mr. Miller is most explicit that plants were found on the north bank of the river and did not occur on the south. I have been unable to find the place name Nyangana (Mr. Miller's spelling) in any maps or gazeteers available to me, but it seems certain that this is the Inhangana which is shown on one map as being  $\pm 93$  km E of Runtu.

S.W. AFRICA.—Caprivi Strip, near Katima Mulilo, cult. PRE, fl. March 1953 and Feb. 1954, *Codd 7595* (BM; PRE; SRGH).

RHODESIA.—N: Gokwe Distr., Msadzi, cult. Gokwe, fl. Feb. 1964, *Bingham 1107a* (SRGH), Mrewa Distr., Shawanoe Riv., cult. Greendale, fl. & fr. l.xii.1954, *Leach in SRGH 49396* (SRGH); *ibid.* cult. NBG, fl. 14.iv.1958, *H. Hall 1146* (NBG); *ibid.* cult. Nelspruit, fl. Jan. 1965, *Leach & Müller 12166* (COI; K; M; NBG; SRGH; WIND). W: Matobo Distr., E. Matopos, cult. Greendale, fl. 27.ii.1958, *M. Paterson* sub *Leach 5719* (SRGH); *ibid.* fl. 12.i.1958, *Leach 5726* (SRGH); "Besna Kobila" rock outcrop, fl. Dec. 1956, *O. B. Miller 3979* (SRGH); *ibid.*, termite mound, fr. Sept. 1961, *O. B. Miller 8019* (SRGH); Kezi, cult. Burnside, fl. 30.i.1966, fr. 7.viii.1966, *W. Bullock 113/4/5* (SRGH); Gladstone Farm, cult. Burnside, fl. 30.i.1966, *W. Bullock 47* (SRGH); Anglesea Farm, cult. Bulawayo Mus., fl. 30.xii.1956, *M. Paterson 208* (BOL); Rowallan Park, Matopos, cult. Burnside, fl. Feb. 1964, *W. Bullock 12* (K); Matopos,  $\pm 67$  km S.S.E. of Bulawayo, cult. Umtali, fl. 12.i.1972, *Plowes 3836A* (PRE); Gordon Park, Matopos, fl. Feb. 1948, drawing only, *Plowes* (PRE). Bulawayo Distr., Burnside, fl. 15.i.1966, *W. Bullock 77* (K). Bulalima Mangwe Distr., Plumtree, *D. A. Robinson in SRGH 41636* (SRGH); *ibid.* cult. SRGH, fl. Feb. 1968, *Drummond 8484* (SRGH). Insiza Distr., Filabusi, fl. March 1949, *R. M. Davies in SRGH 22687* (SRGH); *ibid.*, cult. NBG, fl. 13.i.1954, *E. A. Schelpe in NBG 44247* (NBG). C: Gwelo Distr., Mlezu Agr. Sch. Farm, fl. 30.xii.1965, *Simon 580* (SRGH); *ibid.*, fl. 5.iv.1968, *Biegel 2591* (SRGH). Makoni Distr., Chiduku Res., *Plowes 2465* (K). E: ? "Sabi River",

without precise locality, fl. 22.i.1934, *Vereker* sub *Eyles 7636* (K). Chipinga Distr., Chibunje, fl. 10.iii.1965 (SRGH), *idem* cult. Nelspruit, fl. Dec. 1965 (PRE), *idem* cult. Umtali, fl. 20.iii.1967 *Plowes 2476* (SRGH); Sabi Gorge (Sabi/Lundi junction) cult. Umtali, fl. 6.ii.1965, *Plowes 2464* (BOL; K; LISC); Melsetter Distr.,  $\pm 35$  km W of Melsetter, fl. 14.i.1972, *Lancaster 11* (SRGH). S: Belingwe Distr., south of Mnene Mission, cult. Nelspruit, fl. Jan.–Feb. 1966, *Leach & Bullock 13145* (BM; BOL; BR; K; LISC; PRE; SRGH; ZSS). Chibi Distr., Tokwe Riv., cult. Greendale, fl. 21.i.1957, *Leach 5467* (SRGH); "Hippo Pools", Lundi Riv., cult. Umtali, fl. 29.ii.1968, *Buckland* sub *Plowes 2644* (SRGH); "Lundi", without precise locality, fl. 9.i.1934, *Vereker in Herb. Eyles 7632* (K; PRE), *idem* cult. Salisbury, fl. 3.ii.1936 (SRGH). Gwanda Distr., 16 km W of Gwanda, *M. Paterson 304; 309* (SRGH). Victoria Distr., Mashaba, fl. 30.xii.1955, *Leach 5571* (SRGH); Mushandike Riv., cult. Nelspruit, fl. Jan. 1965, *Leach 12059* (K; PRE). Shabani Distr., Shabi Riv., cult. Greendale, fl. Apr. 1960, *Leach 9948* (SRGH); Ngesi Riv., fl. 26.xii.1959, *Leach 9707* (SRGH); *idem* cult. Greendale, fl. 20.ii.1960, *Leach 9766* (PRE; SRGH). Bikita Distr., Moodie's Pass, cult. Greendale, fl. 15.ii.1960, *Leach 9761* (LISC).

There is greater variation in both colour and size of flower in this subspecies than in the typical; the corolla ground colour varies from yellowish cream to greenish yellow, and occasionally to dark yellow similar to that of subsp. *caudata*. The spots also vary considerably in size and density and in colour from light brownish red to purple or reddish violet. Some exceptionally small-flowered plants were found by Mr. Plowes near Chibunje and in the gorge near the junction of the Sabi and Lundi rivers; however, the size of the flowers increased when plants were placed in cultivation in Umtali, while similarly small flowered plants have been found at a number of localities, sometimes in association with plants displaying larger, more normally dimensioned flowers e.g. 16 km W of Gwanda, *M. Paterson 304* and *309*. Var. *milleri* was based apparently on a similar rather small-flowered specimen with corolla lobes 22 mm long. Cuttings, reputed to be from the type plant of this variety, were obtained from Mr. A. H. Miller (now living in Hermanus) by Mr. Plowes; these, cultivated in Umtali, bore even smaller flowers with lobes averaging only 18 mm in length. There appears therefore to be no justification for taxonomic recognition of these small flowered plants as the variation from smallest to largest flowers appears to be more or less continuous and to have no distributional correlation.



FIG. 3.—Putative hybrid: *Caralluma caudata* x *Stapelia kwebensis*, assumed  $F_1$  Plant from Chibunje, Sabi Valley, Rhodesia, cult. Nelspruit (12789).



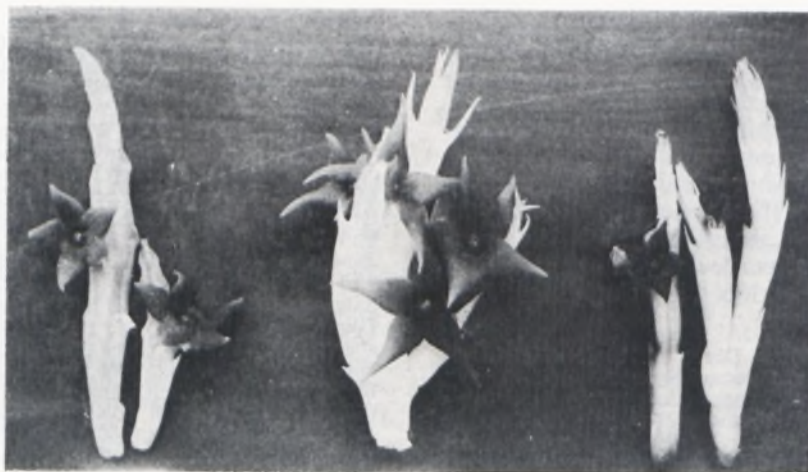


FIG. 4.—Left: *Stapelia kwebensis*, Dumela, Mozambique (12307); centre and right: *Caralluma caudata* x *S. kwebensis*, Chibunje, Sabi Valley; centre, assumed  $F_1$  (12789); right, assumed  $F_2$  (14073).

The chromosome numbers given for these two taxa are those published by Professor G. Reese in *Portugaliae Acta Biologica* 12: 1–23 (1971).

#### ASSUMED INTERGENERIC HYBRIDS

##### *Caralluma caudata* N.E.Br. X *Stapelia kwebensis* N.E.Br.

A plant having every indication of being of this parentage was discovered by Mr. Plowes near Chibunje in the lower Sabi valley area of Rhodesia; this was growing amongst a number of plants of *C. caudata* subsp. *rhodesiaca* with, as far as could be ascertained, no *S. kwebensis* in the immediate vicinity, although this species is known to be not uncommon in the general area.

Cuttings from this plant, cultivated at Umtali and Nelspruit, produced rather attractive dark-coloured flowers which appeared to be nearer to those of *S. kwebensis* than of *C. caudata*. Plants were also raised from seed obtained from the original wild plant and flowers from these proved to be still nearer to those of *S. kwebensis*, although the stem characters displayed by the original (assumedly  $F_1$  generation) were retained to a greater or lesser extent in this  $F_2$  generation.

From the foregoing it seems that the floral characteristics of *C. caudata* are recessive, at least when hybridised with *S. kwebensis*, and that, in the present instance, *C. caudata* was probably the mother plant, with long stem teeth dominant.

RHODESIA.—E: Chipinga Distr., Chibunje, Sabi Valley, cult. & fl. Umtali, Feb. 1965, D. C. H. Plowes 2477 (PRE; SRGH); idem cult. & fl. Nelspruit Sept./Nov. 1965, Plowes, 2477 sub *Leach* 12789 (K; KIEL; LISC; SRGH); ibidem, seedling ex Plowes, assumed  $F_2$ , cult. & fl. Salisbury, sub *Leach* 14073 (SRGH).

*Stapelia tarantuloides* R. A. Dyer in Flow. Pl. Afr. 18: t.717 (1938). Type: Rhodesia, Gwanda Distr., S. Thompson s.n. in PRE 24162 (PRE!).

It has long been suspected that the plant on which this species was based might prove to be of hybrid origin, with *Stapelia gigantea* N.E.Br. one parent. Apparent confirmation of this has recently become evident in plants which have appeared spontaneously and independently in Mr. & Mrs. Bullock's Burnside garden and in Mr. Cannell's at Rangemore, both in

the Bulawayo District. No plants similar to these have ever been collected by either Mr. & Mrs. Bullock or Mr. Cannell, although the Bullocks, in particular, are known to have made numerous trips over a number of years in an effort to rediscover plants corresponding to Sheilah Thompson's. Other searches of the general area west of Gwanda and especially along the Mwele River by Mr. D. C. H. Plowes, the author and others have also all resulted in failure.

However, the plants which have appeared in the two gardens appear to conform in all respects with that originally described under the name *S. tarantuloides*; that these are of hybrid origin seems to be beyond dispute and since the only other species cultivated in Mr. Cannell's garden were *S. gigantea* and *Caralluma caudata* N.E.Br., it seems almost equally certain that these were the parents. The same two species were also plentifully represented in the Burnside garden and although *C. lutea* N.E.Br. (= *C. lateritia* N.E.Br.) was also present, both naturally and in cultivation, this is considered to be unlikely to have been involved.



FIG. 5.—*Stapelia gigantea* x *Caralluma caudata*, assumed  $F_1$  hybrid (W. Bullock GH 2 sub *Leach* 14746B).

Of the three species, *S. gigantea* is plentiful in the Mwewe River area and *C. caudata* is not uncommon; *C. lutea* has not, on the other hand, so far been recorded.

From the foregoing it seems reasonably safe to assume that *S. tarantuloides* is a hybrid of *S. gigantea* and *C. caudata*. The assumption that *C. caudata* should be one of the parents appears to receive support from the similarity of the stems of the putative hybrid *Stapelia kwebensis* N.E.Br. X *C. caudata*, discussed elsewhere in this paper, and in which the floral characteristics of *C. caudata* also appear to be recessive and long stem teeth dominant.

RHODESIA.—W:  $\pm$  80 km W of Gwanda, near Mwewe Riv., in the Matopos Hills, under protection of low thorny *Acacia* sp., *Sheilah Thompson s.n.*, cult Messina, N. Transvaal, in PRE 24162 (PRE!). Bulawayo Distr., hort. Bullock, spontaneous in cultivation, fl. 1970, *Bullock GH2*, sub *Leach 14746* (PRE; SRGH), idem, with deeper tube and more attenuate corolla lobes, sub *Leach 14746A* (PRE; SRGH), idem cult. Salisbury, fl. Nov. 1971, sub *Leach 14746B* (K; KIEL); hort. Cannell; spontaneous in cultivation, fl. May 1971, *Cannell 465* (PRE, SRGH).

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