

On *Sphaeranthus similis* Kers spec. nov.,
S. epigaeus Schinz and *S. stuhlmannii* O. Hoffm.
(*Compositae*), with notes on their
distribution, branching and growth-habit

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(3 Figures)

ABSTRACT

Sphaeranthus similis n. sp. is described from southern Angola. The new species is closely allied to *S. stuhlmannii* O. Hoffm., a plant native to Tanzania. New records of *S. epigaeus* Schinz are given from S.W.Africa and Angola. These three species differ from the other species in the genus as they have a main stem of seemingly indefinite growth and a clear basitonous development of the glomerule-bearing dwarf shoots. Their branching and the basicarpic features are discussed.

SPHAERANTHUS SIMILIS Kers species nova

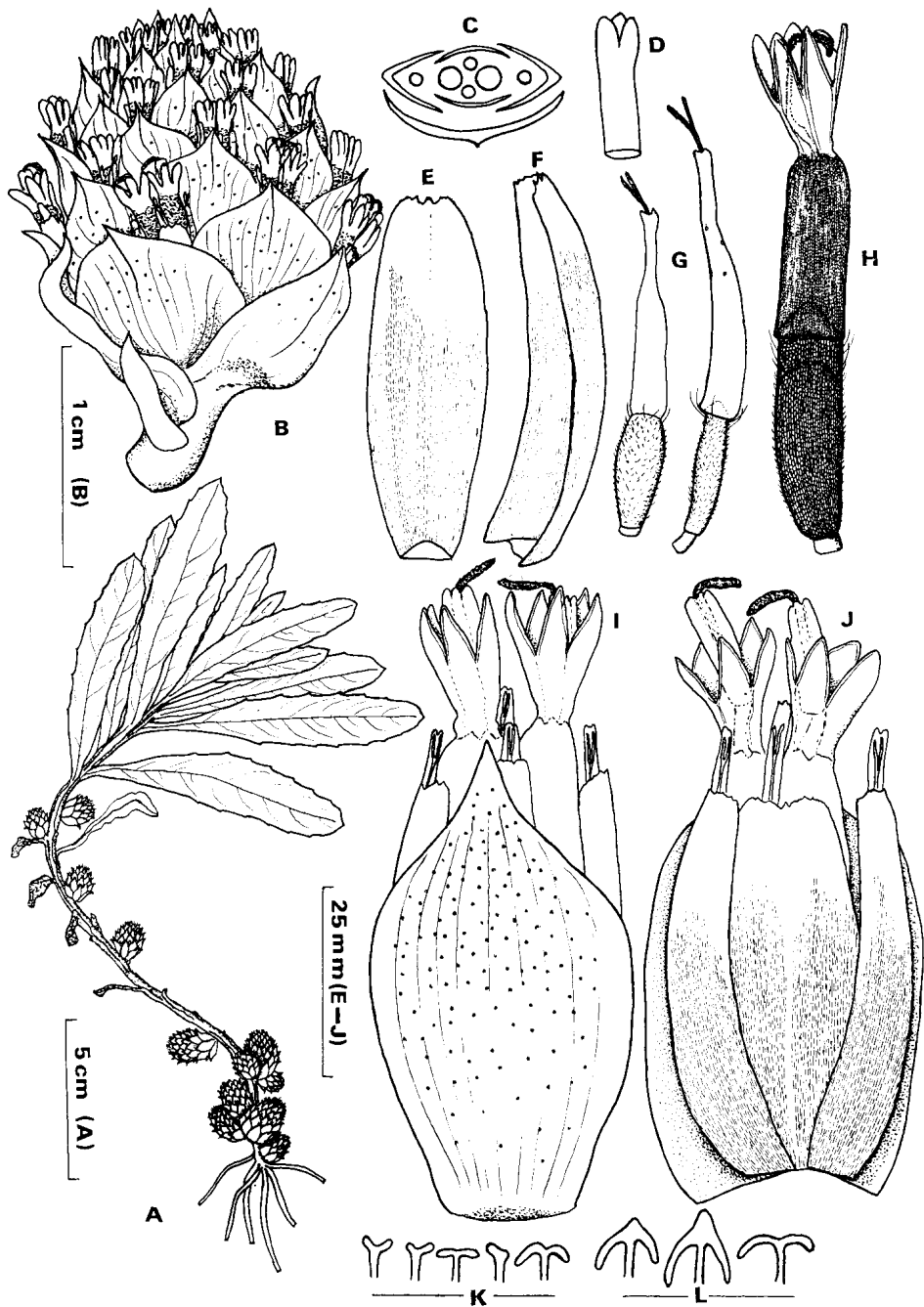
Herba annua erecta rigescens usque ad 30 cm alta simplicicaulis vel raro ramosa, caule apicem versus dense foliato, foliis inferioribus deciduis. Caulis basin versus glomerulis axillaribus dispositus; glomeruli ovoidei sessiles; bractee capituli 4; flores capituli 6: 4 feminei, 2 hermaphroditi, hi bractee capituli superantes.

Species nova habitu *S. stuhlmannii* O. Hoffm. similis et hanc speciem Tanzaniam proxima, illa species angolensis ab *S. stuhlmannii* praecipue glomerulo differt, bracteis infimis haud in cupula dispositis, bracteis exterioribus integris, floribus femineis longioribus. Flores hermaphroditi glabri; pars infundibulariformis corollae parte tubulosa brevior. Achenia pubescentia.

T y p u s : Kers n. 3260, 18. IV. 1968, Angola, Huila district. Near Humbe, along the road Rocadas — Sá da Bandeira (H o l o t y p e in the Museum of Natural History Stockholm, i s o t y p e s in the Herbarium, Department of Agriculture, Windhoek and in the Centro da Botânica da Junta de Investigações do Ultramar (LISC, Lisboa).

Figure 1:

Sphaeranthus similis Kers spec. nov. (drawn from Kers 3260, type). **A.** Aspect of flowering specimen with glomerules in the axils of withering leaves. **B.** Glomerule, conifer-cone like with the hermaphrodite flowers well exerted from the outer subtending bracts. **C.** Diagram of capitulum. The outer subtending bract below. Four scale-bracts enclose the flowers, the lateral bracts are folded lengthwise. Six flowers within the capitulum: four female flowers around the two hermaphrodite ones. **D.** Apical portion of corolla in a female flower, showing the three small corollar lobes. **E.** Outer median bract of the capitulum. **F.** Lateral bract. **G.** Female flowers. **H.** Hermaphrodite flower. The cell structure marked on the suberized portion of the corolla and on the achene. **I.** Capitulum (abaxial view), with the outer subtending bract. **J.** Same capitulum (adaxial view) showing the inner median subtending bract and the two lateral bracts. **K.** Apices of hairs from a female flower. **L.** Apices of hairs from a hermaphrodite flower.



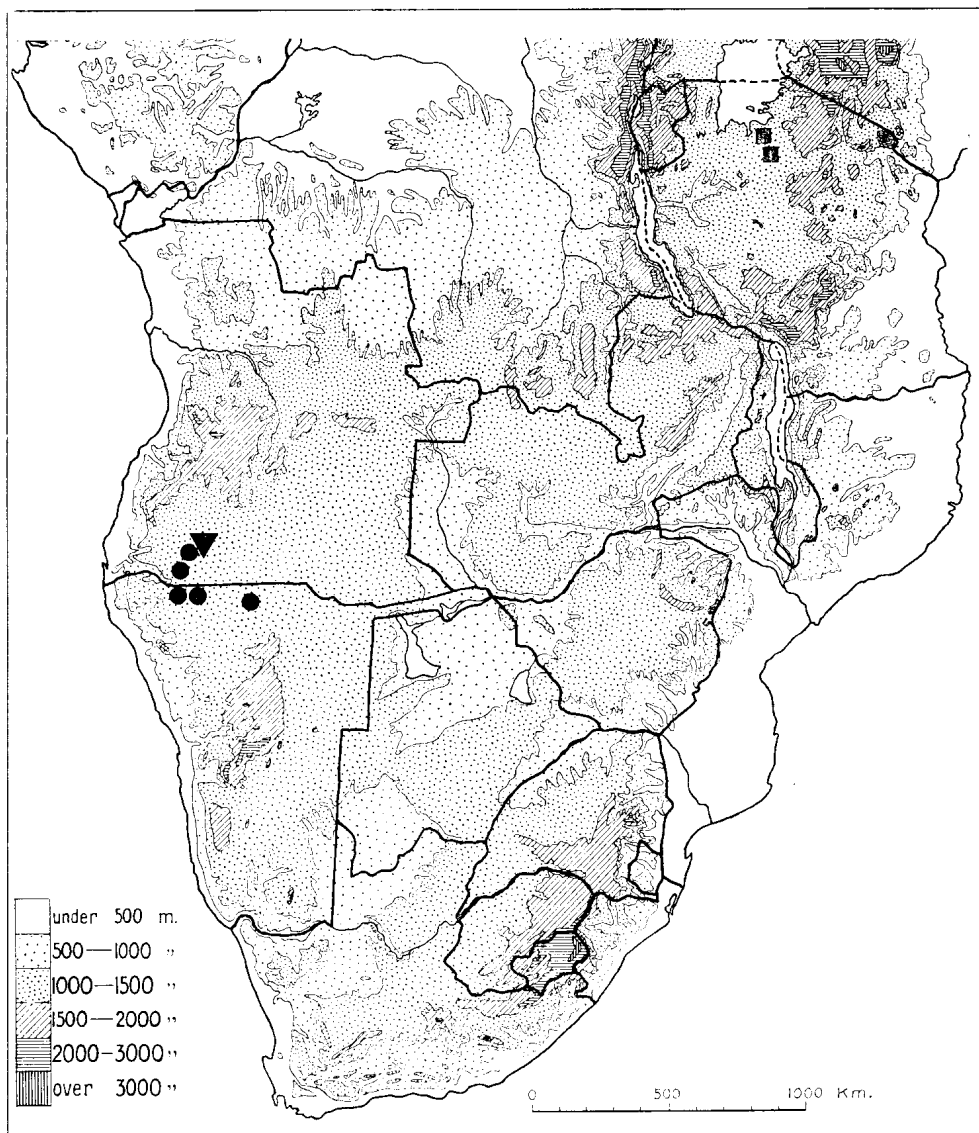


Figure 2:

Distribution of three species of *Sphaeranthus*.

- *Sphaeranthus stuhlmannii* O. Hoffm. (Tanzania)
- ▼ *Sphaeranthus similis* Kers (Angola)
- *Sphaeranthus epigaeus* Schinz (Angola, S.W. Africa)

Note the considerable interval which separates the known localities for *S. stuhlmannii* and *S. similis*. The two localities marked for *S. stuhlmannii* are those mentioned by Mrs. Ross-Craig (1954, p. 76).

Icon.: Fig. 1.

Distrib.: Fig. 2.

Annual erect herb up to 30 cm tall, simple or branched, sometimes decumbent and rooting in the lowermost portions, with a dense tuft of leaves in the upper part of the stem and with axillary greenish-brown glomerules appearing towards the base of the stem. Stem and most branches of seemingly indefinite growth, glabrous, main stem slender but becoming stiffly erect, with very narrow deciduous wings. Leaves narrowly obovate, 3 — 10.5 cm long and 0.5 — 2.5 cm broad, rounded — obtuse, mucronate, denticulate, sparsely and minutely scabridulous on the margin, sparsely glandular-punctate, spreading — ascending, decurrent into the very short and narrow wings of the stem, margins of wings entire. Glomerules solitary and subsessile or clustered on short peduncles in the axils of rapidly withering leaves, crowded towards the base of the stem, ovoid, 6 — 15 mm long and 5 — 11 mm broad, without a distinct involucre at the base, like the cone of a conifer with the subtending bracts tightly overlapping, apices of subtending bracts not hidden by the capitula, the hermaphrodite flowers at least well exerted and easily seen. Subtending bracts broadly ovate to obovate, 6 — 4 mm long and 5 — 3 mm broad, shortly rostrate to mucronate, margin entire, the bracts are progressively smaller and narrower higher up the glomerules, greenish-brown, without a distinctly marked mid-rib, sparsely and minutely glandular-punctate in the upper portion, and their apices somewhat recurved. Receptacle lanceolate in longitudinal section. Bracts of the capitulum 4, glabrous, scarious with hyaline upper portion, 5 mm long and 1.5 — 2 mm broad, entire on the lateral margins, truncate — erose at the apex, sometimes with the mid-vein slightly excurrent, lower half with a longitudinal pattern of fine violet striae; lateral scale-bracts folded lengthwise, carinate at the back and curved in lateral view, median scale-bracts almost similar and nearly plane. Flowers in each capitulum 6. Female flowers 4, 4 — 5 mm long, corolla subulate, suberized except in the apical part, terminating in three exceedingly small erect lobes, glabrous or with some few sessile glands in the upper portion; style 3 mm long, glabrous, deeply bifid, shortly exerted; achenes sessile or almost so, 1 mm long, usually sterile, provided with sessile glands and bifid hyaline hairs. Hermaphrodite flowers 2, 5.5 — 6 mm long, corolla glabrous, infundibulariform in the upper third then sharply constricted above the lower tubular and suberized two thirds, the upper portion pale violet and of a soft tissue, corolla lobes somewhat spreading, c. 1 mm long and slightly thickened along the margins; anthers 1 mm long, becoming exerted from the corolla by their upper half; style 3 — 4 mm long, far exerted, minutely papillated in the upper third; achenes fertile, brown, sparingly glandular and with hyaline hairs, apices of hairs forked — glochidiate.

Sphaeranthus similis Kers is closely related to *S. stuhlmannii* O. Hoffm., a species native to Tanzania. *S. similis* differs from *S. stuhlmannii* mainly in the glomerules. The lower subtending bracts of the glomerules are not distinctly longer than the upper ones, and they are not well spread; hence they do not form an involucre around the base of the glomerules. The flowers are larger than in the related species, (♀ flowers 4 — 5 mm long as against 2.5 — 3 mm; ♂ flowers 5.5 — 6 mm long as against 3.5 mm long in *S. stuhlmannii*), and the

infundibulariform portion of the hermaphrodite flowers is shorter than the tubular portion, while in *S. stuhlmannii* the condition is the reverse. The achenes are glandular and hairy while glabrous in the related species. In *S. similis* the glomerules are larger than in *S. stuhlmannii* (up to 15 mm long as against 11 mm), and the glomerules appear on the lower half of the stem, usually near the base only, while in *S. stuhlmannii* they tend to be scattered throughout the whole length of the stem (cp. Ross-Craig 1954, p. 75, t. 3520 a).

In *Sphaeranthus similis* the glomerules first appear at the very base of the stem, later in upward succession in some of the lower axils. The subtending leaves soon wither away when the glomerules appear. The specimens therefore attain a characteristic habit of growth with fresh leaves only in the apical soft portions of the stem, while the basal stiff parts of the stem bear the glomerules, usually placed in cluster just above the soil level. The same peculiar habit of growth also characterizes *S. epigaeus* Schinz. Both these species occur at margins of shallow pools which rapidly dry out ("vleis"). The annual vegetation around such pools is usually heavily grazed by cattle or by wild animals. According to the author's field observations, only the soft upper leaf-bearing portions of *S. similis* are grazed, while the stiff lower stems with the glomerules remain. Therefore *S. similis* seems to be well adapted to resist grazing and trampling due to its peculiar mode of growth, hard conifer-like glomerules and ability to root from the lower nodes when trampled.

The author found this new species c. 13 km NNW of Rocadas, between Humbe and Catequero near the road from Rocadas to Sá da Bandeira. The specimens occurred on black, dried-up soil around some shallow pools and along dry water run-offs on a plain with scattered *Colophospermum mopane*, *Adansonia*, *Fockea multiflora* and *Sansevieria*, *Sphaeranthus epigaeus* Schinz was also found in this locality (Kers n. 3686).

Notes on *SPHAERANTHUS EPIGAEUS* Schinz

This species was hitherto known solely from two collectings. Both originate from the northernmost parts of S.W.Africa ("Ovamboland") where they were collected by the Finnish missionary Martin Rautanen in 1897. Hereafter this species seems to have escaped collection by botanists (cp. Prodr. Fl. S.W.Afr. 139, 1967). The type locality was given as Ombalambuenga. According to Mr. W. Giess, this place is nowadays spelled Ombalambwenge, and it is situated at Oshigambo, 11 miles east of Onipa, and east of Ondangua (Giess 1969, in a letter).

In 1968 the author found *Sphaeranthus epigaeus* in the northernmost parts of S.W.Africa as well as in the adjacent regions of Angola. The species occurred frequently at the fringes of shallow, almost dried-up water depressions ("vleis") on the sandy plains there. It was by no means a rare species. The specimens may at first sight easily be taken for some non-flowering Composite because the small glomerules are inconspicuous, greenish and almost hidden from observation at the base of the stem just above the soil level. The species is by its

habit rather similar to *Ondetia linearis* Benth. The known localities for *Sphaeranthus epigaeus* have been mapped in fig. 2.

The author has found Mrs. Ross-Craig's treatment of this species to be quite accurate, though the material available to her was very scarce (Ross-Craig 1954). The following observations made on the new material may, however, be worth mentioning.

The specimens are often unbranched with the simple main stem reaching up to 40 cm in height, but quite a few specimens are richly branched and then from near the base. The lateral branches may be almost as tall as the main stem. Some specimens are decumbent in their basal portions and rooting from the lower nodes. The lower leaves are deciduous. The leaves are 3 — 12 cm long and 3 — 20 mm broad, narrowly lanceolate to oblanceolate, tapering gradually at the base and decurrent into the very narrow and deciduous wings of the stem. The leaf-apex is (rounded-) obtuse to acute and minutely mucronate. The shoot apices are somewhat woolly with long soft hairs which are intermingled with the young leaves. The glomerules are borne at the base of the stem and are usually found only at the very base, seldom up to 12 cm above the soil level. The glomerules develop in an upward succession on the stem. The uppermost glomerules are much retarded in growth and will probably not produce flowers or ripe seeds before the specimens die at the end of the growing season. All specimens observed by the author were annual plants. The main stem and most of the lateral (long) branches seem to have an indefinite growth. The glomerules terminate shoots, which are dwarf when borne at the base of the specimens and have scale leaves. Higher up on the individuals, some lateral branches (long shoots) with normal leaves may also terminate in glomerules (cp. fig. 3: F, left specimen). The author has found up to 12 female flowers in the capitulum. The flowers are very insignificant and hardly exceed the subtending bracts of the capitulum.

COLLECTIONS

South West Africa

Ovamboland: Kers n. 3129, 16. IV. 1968, Ombalantu (M, S); Kers 3666, 4. V. 1968, Road: Ruacana Falls — Ondangua, 32 km W of Ombalantu (S); Rautanen 196, 1897, Ombalambuenge. Type. (BM, G, K, M, non vidi, S); Rautanen 240, (BM, G, M, non vidi).

Angola

Huila distr.: Kers 3123, 17. IV. 1968, Track: Ruacana Falls — Rocadas, 5 km NE of Naulila (S); Kers 3686, 18. IV. 1968, Road: Rocadas — Sá da Bandeira, near Humbe (S).

Figure 3:

Branching and growth-habit in *Sphaeranthus*.

- Sympodial branching. Each shoot-apex terminated in a glomerule, no sessile glomerules in the leaf-axils. Acrotonous branching.

A. *Sphaeranthus incisus* Robyns illustrates the common type of branching in *Sphaeranthus* (Kers 2580).

- Sympodial branching and with sessile glomerules in the leaf-axils.

B. *S. spathulatus* Peter. Sessile glomerules are borne in the leaf-axils throughout the stem (after Ross-Craig 1954, p. 76, t. 3220 B).

C. *S. mimetes* Ross-Craig. Similar to "A", but sessile glomerules may occasionally appear at the base of the main stem (after Ross-Craig 1954, p. 72, t. 3519).

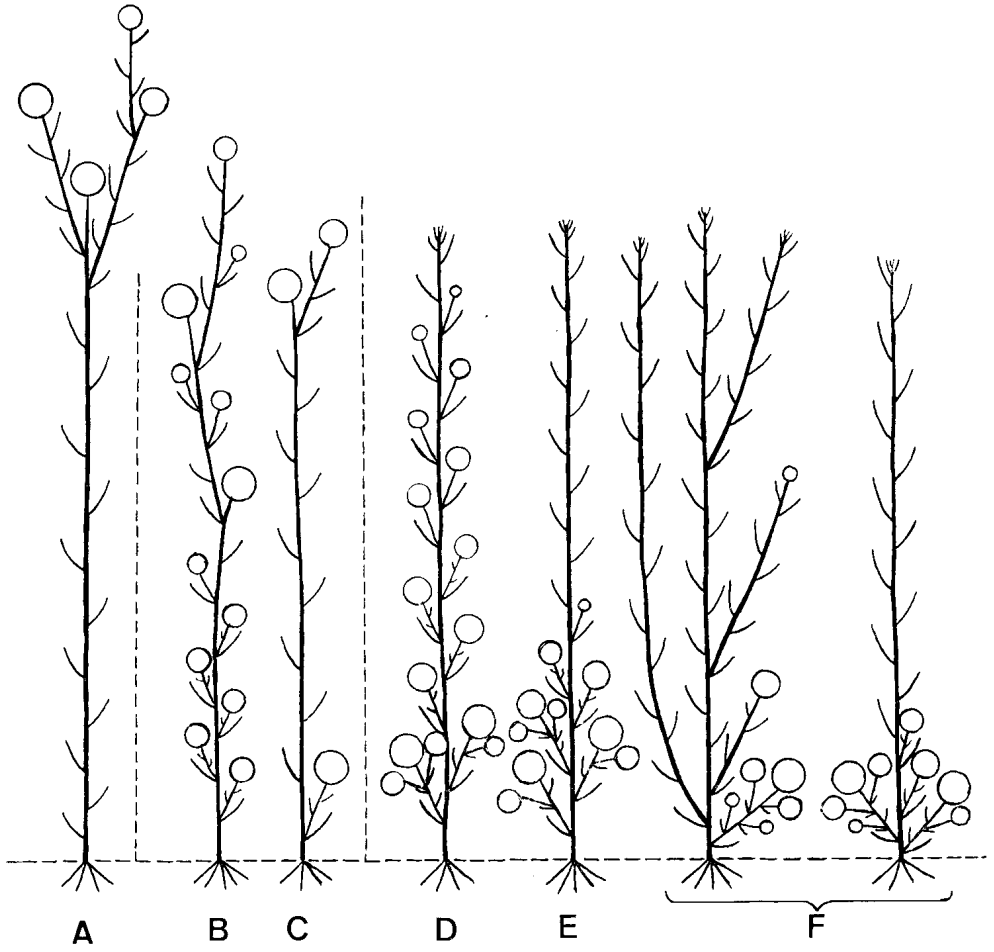
- Monopodial branching. Main stem of seemingly indefinite growth. Glomerules appear in the leaf-axils and usually, on dwarf shoots. Basitonous branching. Basicarpic species.

D. *S. stuhlmannii* O. Hoffm. The glomerules will first develop at the base of the main stem, later progressively upwards along the whole stem (after Ross-Craig 1954, p. 75, t. 3520 A).

E. *S. similis* Kers. Similar to *S. stuhlmannii*, but the glomerules only appear at the base of the plant (Kers 3260).

F. *S. epigaeus* Schinz. Two specimens are illustrated. The left specimen represents a richly branched plant in which some lateral long shoots — with normal leaves — terminate in glomerules. The right specimen illustrates the basicarpic condition with the glomerules clustered near the soil-level (Kers 3123, 3129, 3666, 3689).

The glomerules have been marked with circles, the younger the glomerules, the smaller the circles.



REMARKS ON THE GROWTH-HABIT IN *SPHAERANTHUS*

Most species of *Sphaeranthus* display an easily recognizable sympodial branching with each main shoot terminated in a glomerule (fig. 3: A). The only exceptions to this general type are found in *Sphaeranthus stuhlmannii*, *S. similis* and *S. epigaeus*, which have a monopodial main stem of seemingly indefinite growth (fig. 3: D, E, F). In these species the glomerules are borne on shoots in the leaf-axils. These shoots are generally much reduced and have scale leaves.

Some few species show, to a certain extent, intermediate features between these two types of growth-habit, since they have sympodial branching and bear sessile glomerules in the leaf-axils (fig. 3: B, C).

The marked difference which occurs in the genus can also be attributed to an acrotonous versus a basitonous development of the glomerule-bearing shoots. In *S. stuhlmannii*, *S. similis* and *S. epigaeus* the glomerules develop in an upward succession along the stem, and the basitonous organization is especially well exemplified in the latter two species. Therefore, they also give examples of basicarpic species.

Basicarpy is a fairly common feature in the flora of southern Africa, notably in the drier regions (Stopp 1958). Stopp gives many examples of basicarpic species there and he points out that this organization may mean a favourable adaptation for species which inhabit drier regions because it would hinder the dispersal of the dissimules ("Antitelechorie").

Stopp mentions different types of basicarpy. The same type as in *Sphaeranthus* can also be found in *Protea decurrens*, *P. cordata*, *P. acerosa* (Stopp 1958, pp. 22—24), *Blepharis dichotoma* Engler and many species of *Petalidium* (*Pseudobarleria*). In all these species the inflorescences are hard and resistant, tend to be spiny and are clustered near the soil level, while the orthotropic shoots are sterile, soft and almost hide the inflorescences from observation.

Based on personal observations on the effects of grazing on *Sphaeranthus*, *Blepharis*, *Petalidium* and other species in southern Africa, the present author suggests that a basicarpic organization will also mean a favourable adaptation to grazing because only the upper sterile orthotropic shoots are generally bitten off. The basal portions of the specimens — with the inflorescences — usually remain intact.

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