STUDIES IN CYPERACEÆ. — 2. CONTRIBUTION TOWARDS A REVISION OF THE MAINLY AFRICAN GENUS ASCOLEPIS Nees ex Steudel

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Summary: The history, the floral structure and a general description of *Ascolepis* are given, completed by a key to its 19 species and a few related or resembling genera. Each species is followed by a full reference and synonymy, a short description, its distribution and in case a note on its taxonomy. Finally, attention is called for the intrageneric (in *Ascolepis s.l.*) and extra-generic relations (in *Cypereæ s.l.*).

Résumé : L'histoire, la structure de l'inflorescence et une description générale du genre *Ascolepis* sont données, suivies d'une clé pour les 19 espèces et quelques genres affines ou ressemblants. Chaque espèce est accompagnée de sa référence et synonymie complète, d'une description, de sa répartition et parfois d'une note taxonomique. Finalement les relations intragénériques (dans *Ascolepis s.l.*) et extragénériques (dans les *Cypereæ s.l.*) sont discutées.

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The present paper is an account of a critical study of the genus *Ascolepis*, executed on herbarium material only. Most species can satisfactorily be recognized in this way, but some of the more common taxa, i.e. the *A. protea*-complex, often cause difficulties and are greatly in need of autoecological studies; clonal differentiation is very likely, especially in the Zambesian region. I have tried to arrange this evolutionary process according to the rigid nomenclatural system, fully aware of the inconveniences connected with.

I would like to thank the Directors of the undermentioned herbaria for the extended loan of the material and for other facilities, and the Belgian " Nationaal Fonds voor Wetenschappelijk Onderzoek " for the award of a grant. The present study was executed at Gent; other herbaria were visited or material was received on loan from : B, BM, BR, BRLU, BRVU, H, K, L, P, SRGH, U, WAG and Z.

HISTORICAL NOTE

The history of the genus *Ascolepis* as understood nowadays started with the publication of *Platylepis* (Kunth, 1837 : 269), a later homonym of *Platylepis* (A. Richard, 1828 : 34); the latter name is now considered

as a taxonomic synonym of the earlier *Erporkis* Thouars, but is conserved against it.

The second step was made by STEUDEL (1842 : 597), who described a *Kyllingia eriocauloides*, which a few years later was put into a new genus *Ascolepis* as *A. eriocauloides* (Steud.) Nees ex Steud. (STEUDEL, 1855 : 105). This *Ascolepis* has been conserved against *Platylepis*, till RICKETT & STAFLEU (1959 : 227) pointed to the fact that there was no more need for conservation, as a result of a more strict application of the homonymy rule; *Ascolepis* nevertheless is still retained on the nomina generica conservanda list.

Ascolepis was based on 3 species, *A. eriocauloides*, *A. kyllingioides* and *A. tenuior* (STEUDEL, 1855 : 105); the last two names are now considered as synonyms of *Lipocarpha microcephala* (R. Br.) Kunth and *Rikliella squarrosa* (L.) J. Raynal respectively; fortunately, the remaining species *A. eriocauloides* is the only one corresponding well to the—partly wrong—generic description, and may therefore be chosen as lectotype.

INFLORESCENCE STRUCTURE

As mentioned in a previous paper (GOETGHEBEUR, 1977 : 436) the structure of the *Ascolepis* inflorescence has been explained by a wide range of interpretations. Most probably, this inflorescence is composed of 1 to few spikes of many spirally arranged and extremely reduced 1-flowered, cyperoid spikelets; this opinion is confirmed by embryological (VAN DER VEKEN, 1965; JUGUET, 1970), anatomical (RIKLI, 1895), morphological (PALLA, 1905; GOETGHEBEUR, 1977) and biochemical (LERMAN & RAYNAL, 1972; RAYNAL, 1972 b) observations.

A lobed head is composed of several spikes; each lateral spike is supported by a bract, but an adaxial prophyll has never been observed there, contrary to the situation in *Lipocarpha* and *Rikliella*, *Mariscus* and *Marisculus*. The lateral spikes and their bracts are gradually diminishing in length, and are finally replaced by lateral spikelets and their bracts, forming the terminal spike. A solitary spike also is surrounded by few to many " involucral " bracts; a whole range may be found from the larger lower ones which are empty, to the smaller upper bracts which are supporting a 1-flowered[1] spikelet.

The different parts of such reduced spikelet are, by all probability, homologous to the bract, the first glume and—when present—the rhachilla of a cyperoid spikelet. The small adaxial, often bristle-like scale of several *Ascolepis* species, was earlier identified as a second glume (GOETGHEBEUR, 1977 : 443), but some recent observations are more in favour of a compound structure, a rhachilla with a second glume at its tip: first, these structures do often persist even when bracts, glumes and fruits have fallen; secondly,

1. We are using " flower " for the whole of sexual structures, although we prefer " anthoid ", especially in morphological studies concerning the homology problem.

at the very apical part of this scale in *A. pinguis* a small but clearly differentiated second glume can be observed, with in its axil the minute rhachilla tip (Pl. 10, *11-14*); until now, this phenomenon has been observed only in that species.

GENERAL DESCRIPTION

Ascolepis-species are annual or perennial scapose herbs; the perennial species may have their culm base bulbously thickened, in the same manner as *Cyperus meeboldii* Kük. (RAYNAL, 1966 : 303, *tab. 1, fig. 7*), covered or not by remnants of leaf sheaths, sometimes provided with underground runners, or growing on an ascending rhizome (or buried stem?); the leaves are crowded at the culm base, their sheath is closed, the back side is hyaline and red-nerved, concave or straight at the top; the leaf blade is thin and inrolled, rarely thickened and ± canaliculate, flat trigonous near the top, the nerves are broad but not very prominent, the margins ± cartilaginous and ± scabrid; the culm is erect, subterete to subtrigonous or rarely trigonous near the top.

The terminal, ± head-like inflorescence is composed of 1-few spikes; a solitary spike may have the marginal glumes, or occasionally all the glumes, elongated; the peculiar structure of *A. majestuosa* is fully discussed under that species and further on; the solitary spike or, in case, the few spikes bear large, empty, ± reflexed " involucral bracts " at their base; the 1-flowered spikelets are densely imbricate on a broadly conical axis or on slender cylindrical axes, holding the short pedicels.

The spikelet parts as described here, are those of fully developed outer spikelets, the inner ones are often less developed and smaller, less-nerved, rudimentary, ... The spikelet bract has several nerves, but only the central one is provided with xylem, the bract is hyaline, thin with a thicker middle and apical part; the first glume can also be several-nerved, but xylem is only to be observed in the central nerve, the glume is ± concave or flattened, utricle-shaped or tubular and ± hyaline in its basal part; trigonous, rhombic or terete and ± thick, swollen in its upper part. The 1-5 stamens are placed anterior and lateral, the filament is broadening and becoming reddish brown at the top when the anther has fallen, the anther has often short sterile appendages at the base and at the top. The style is deeply 2-3(-5)-fid, ± trigonous near the base. The fruit is mostly obovate, subtrigonous, pale to dark brown, sometimes with a narrow, almost white narrowing basal part; the silica cones in the surface cells seem to provide a useful diagnostic character, but unfortunately, most specimens have but very few or no ripe fruits at all. The " rhachilla ", when present, is placed opposite to the first glume between the fruit and the spike axis, mostly hyaline, subterete and slightly thickened near the top, sometimes more glume-like with a central nerve, obviously swollen at the tip, and with thin hyaline wings; exceptionally, a second glume is differentiated

near the rhachilla-tip. We suppose that this scale is a complex one, uniting both rhachilla and a rudimental, indistinguishable (exc. in *A. pinguis*) second glume.

KEY TO THE *ASCOLEPIS*-SPECIES AND A FEW OTHER GENERA

1. Spikelet bract larger than glume; glume and prophyll thin, hyaline scales. *Lipocarpha*
   Spikelet bract smaller than glume; glume not hyaline; prophyll present or not, or only one scale present 2
2. Spikelet prophyll present, as an adaxial scale ± clasping the glume, or an adaxial scale outside the closed glume 3
   Spikelet prophyll absent ..... *(Ascolepis)* 7
3. Styles 2 ..... *Kyllinga*
   Styles 3 4
4. Glume margins adaxially connate 5
   Glume margins free 6
5. Tiny annual herb with yellowish inflorescence ..... *Mariscuius peteri*
   More robust, perennial herb ..... *Ascopholis gamblei*
6. Hypogynous disk present ..... *Alinula lipocarphoides*
   Hypogynous disk absent ..... *Mariscus*
7. Glume margins adaxially connate for at least half their length 8
   Glume margins free to the base 12
8. Glume conspicuously dorsoventrally flattened, laterally winged; style branches 2. 9
   Glume not dorsoventrally flattened, style branches 3 or more 10
9. Basal part of glume obovate to rhombic, gradually narrowing into a rather broad apical part, tip rounded; stem base mostly covered by brown or grey ± fibrous remnants of leaf sheaths; slender subterranean runners may be present; spikelet bract ± spathulate ..... 12. *Ascolepis capensis*
   Basal part of glume broadly obovate, gradually narrowing into a narrowly triangular apical part, tip subacute; stem base covered by reddish brown leaf sheaths; runners always absent; spikelet bract linear to narrowly triangular ..... 13. *A. brasiliensis*
10. Robust perennial species; stem triquetrous near the top; leaves thick, ± canaliculate, sharply keeled; spike solitary, 1 cm diam. ..... 14. *A. menonguensis*
    Slender annual species; spikes (1-)2-6, very small 11
11. Inflorescence conspicuously yellow or greenish yellow; glumes utricle-shaped, adaxial scale outside the glume present, at least in the lower spikelets... *Mariscuius peteri*
    Inflorescence pale brown or greyish, glumes trumpet-shaped.... 17. *A. pusilla*
12. Spikelet 3-scaled : bract, glume and rhachilla 13
    Spikelet 2-scaled : bract and glume 19
13. Very slender annual species; inflorescence less than 10 mm diam., composed of (1-)2-6 easily recognizable spikes 14
    ± Robust perennial species, inflorescence 15-60 mm diam., a head or head-like. 15
14. Spikes squarrose, due to the recurved subterete glume tips. 18. *A. dipsacoides*
    Spikes with a whitish appearance, due to the hollow, swollen glume tips..... ..... 16. *A. ampullacea*
15. Inflorescence head-like, composed of 3-7 tightly packed spikes, recognizable as bundles of long and narrow radiating elongated glumes..... 19. *A. majestuosa*
    Inflorescence 1 spike, spikelets sessile on a broadly conical axis, no separate bundles of elongated glumes present 16

16. Glume bent, basal and apical part almost at a right angle to each other; involucral bracts, spikelet bracts and basal part of glumes conspicuously reddish-nerved... ..... 15. *A. pinguis*
Not so 17

17. Glume somewhat bent, pale brownish, middle part not inflated, lateral nerves not prominent ..... 9. *A. neglecta*
Glume not bent, white or orange to brownish red, middle part inflated, all nerves prominent..... 18

18. Glume whitish, partly turgid, not shining..... 10. *A. fibrillosa*
Glume orange to brownish red, wholly turgid and shining..... 11. *A. speciosa*

19. Tip of bract and glume somewhat spinulose, caused by projections of cells; low perennial herb, base conspicuously bulbously thickened ..... 8. *A. spinulosa*
Tip of bract and glume ± rounded 20

20. Heads very dense, glume apical parts tightly packed 21
Heads less dense, glume apical parts ± patent 23

21. Glume 3-4 mm long, head 6-13 mm diam.; rather small stoloniferous perennial ..... 4. *A. hemisphærica*
Glume 1.8-3.5 mm long, head 5-9 mm diam.; slender non-stoloniferous perennials. 22

22. Apical part of glume very slender, narrowly triangular, tip subacute.. 5. *A. densa*
Apical part of glume dorsiventrally flattened, plumb triangular, surface cells shiny, ± inflated, tip rounded ..... 6. *A. trigona*

23. Apical part of glume conspicuously subulate, very narrow, tapering; stamen 1.. ..... 3. *A. eriocauloides*
Apical part of glume broader; stamens (2-)3 24

24. Spike very small, 4-6 mm diam.; glumes yellow to orange-brown, with shiny ± inflated surface cells, crescent-shaped on cross-section, rather narrow..... ..... 7. *A. pseudopeteri*
Not so 25

25. Spike small, 5-8 mm diam., often dark-coloured, brownish white; stem base covered by a dense mass of remarkably pale brown fibrous leaf sheaths.. 2. *A. metallorum*
Not so ..... 1. *A. protea*. 26

26. Glumes unequally elongated 27
Glumes equally or not elongated..... 29

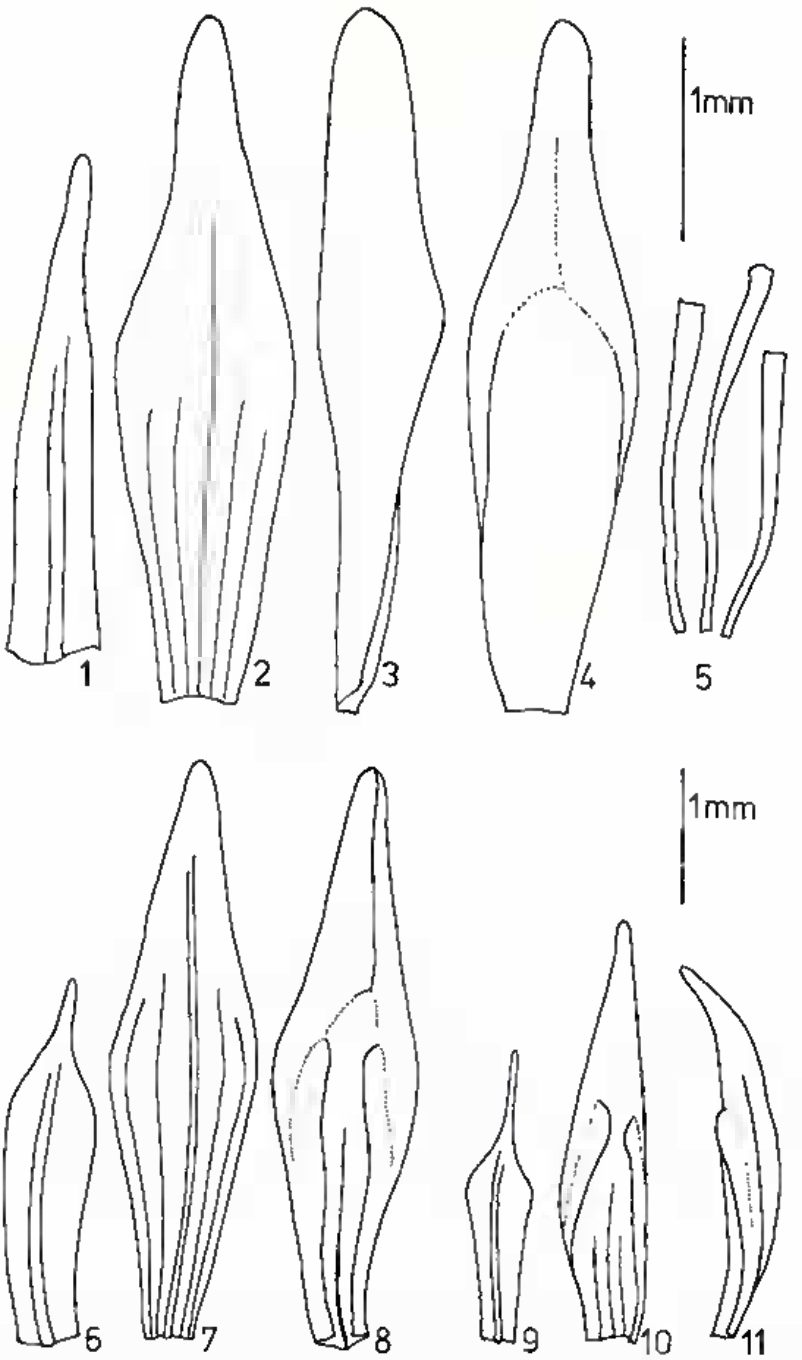
27. Tip of outer glumes broadly rounded; inflorescence (10-)15-25 mm diam..... ..... var. *anthemidiflora*
Not so 28

28. Involucral bracts relatively many; outer glumes curved when dry, giving the head a wrinkled appearance ..... var. *stellata*
Involucral bracts 2-4; outer glumes not curved when dry, otherwise extremely variable ..... var. *bellidiflora*

29. All glumes elongated; inflorescence showy, (15-)25-35(-50) mm diam., often whitish ..... var. *splendida*
Not so 30

30. Glumes not elongated, not or rarely shining, whitish, often red-dotted; inflorescence 5-8(-10) mm diam. ..... var. *protea*
Not so 31

31. Glumes yellowish to orange or even dark brown, very rarely pale yellow or white, inflorescence 8-20 mm diam. ..... var. *ochracea*
Glumes whitish, turgid and shining, inflorescence unusually dense, (10-)12-15 mm diam. ..... var. *floribunda*



Pl. 1. — **Ascolepis protea** Welw. var. **protea** (*Welwitsch 1667*, BM) : **1,** bract dorsally; **2,** glume dorsally; **3,** glume laterally; **4,** glume ventrally; **5,** filaments. — var. **ochracea** (Meneses) P. Goetghebeur (6-8 from *Symoens 10067*, BRVU; 9-11 from *Lisowski, Malaisse & Symoens 828*, BR) : **6,** bract dorsally; **7,** glume dorsally; **8,** glume ventrally; **9,** bract dorsally; **10,** glume ventrally; **11,** glume laterally.

DESCRIPTIONS

ASCOLEPIS Nees ex Steudel

Syn. Pl. Glum. 2 : 105 (1855).
— *Platylepis* KUNTH, Enum. Pl. Glum. 2 : 269 (1837), *non* A. RICHARD 1828; syntypi : *P. capensis* Kunth, *P. brasiliensis* Kunth.
— *Pterachne* SCHRAD. ex NEES, *in* MART., Fl. Brasil. 2 (1) : 62 (1842), *nom. inval., pro syn.*
— *Pterogyne* SCHRAD. ex NEES, *in* MART., *l.c.* : 62 (1842), *nom. inval., pro syn.*
— *Antrolepis* WELW., Apont. : 578 (1859), *nom. provis.*

LECTOTYPUS : *A. eriocauloides* (Steud.) Nees ex Steud.

Antrolepis is a name created by WELWITSCH (1859 : 578) for 5 glumaceous species, in some respects resembling certain *Cyperaceæ*, but otherwise markedly different from the cyperaceous type and in his opinion probably forming a new family " *Antrolepideas* ". At that time he had not any literature nor analytical instruments at his disposal (WELWITSCH, 1859 : 578) and therefore merely mentions 5 names with a few descriptive notes. For this reason we may accept that WELWITSCH had given those names provisionally (see title!), until he could study those species more thoroughly and publish the final version (WELWITSCH, 1869).

1. **Ascolepis protea** Welwitsch

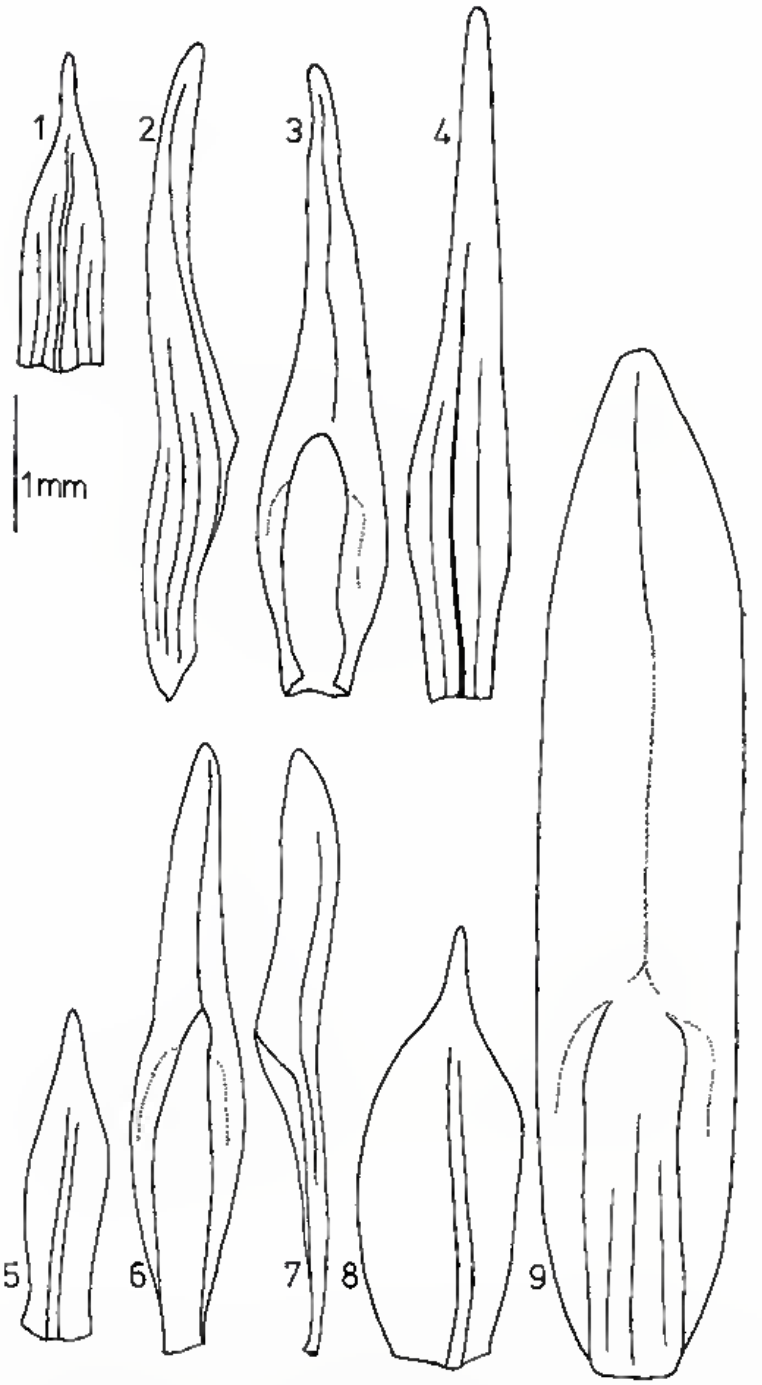
Trans. Linn. Soc. 27 : 75 (1869).

This common species has caused much trouble in the past, and it will be continuing in the future, since in many localities there exist ± differentiated populations, indicating an active speciation process; quite a lot of them may deserve a taxonomic treatment on varietal or even specific level : auto-ecological and reproductional studies as well as accurate observations on glume shape and texture at different developmental stages would be very useful for elaborating such a treatment. Obviously, a few taxa of the *A. protea*-complex are yet well established and sharply limited: I consider them as species, e.g. *A. eriocauloides*, *A. hemisphærica*, *A. metallorum*, ... The limits of other taxa are very diffuse, for intermediate specimens are not infrequent, although typical plants are very easily recognizable and widely different from one another : for the time being, varietal names seem appropriate to give expression to these diverging taxa.

var. **protea**

≡ *Ascolepis protea* WELW. var. *kyllingioides* WELW., Trans. Linn. Soc. 27 : 76 (1869), *nom. illeg.*

TYPUS : *Welwitsch 1667*, Angola (holo-, BM!; iso-, K!).



Pl. 2. — **Ascolepis protea** Welw. var. **floribunda** P. Goetghebeur (*Gérard 3873*, BR) : **1,** bract dorsally; **2,** glume laterally; **3,** glume ventrally; **4,** glume dorsally. — var. **anthemidiflora** Welw. (*Nash 189*, BM) : **5,** inner bract dorsally; **6,** inner glume ventrally; **7,** inner glume laterally; **8,** outer bract dorsally; **9,** outer glume ventrally.

Rather small and slender, ± tufted perennial herb without runners; stem 5-30 cm high, 0.5-1 mm diam. Inflorescence 5-8(-10) mm diam., ± spherical, all glumes about equally long, basal and middle part almost always red-dotted, their apical parts ± patent, ± whitish, rarely turgid and shining. — Pl. 1, *1-5*.

AFRICA : soudano-zambesian, from Senegal to Sudan, S extending to Zambia.

var. **ochracea** (Meneses) P. Goetghebeur, *comb. nov.*

≡ *Ascolepis speciosa* WELW. var. *ochracea* MENESES, Garcia de Orta 4 (2) : 260 (1957).

TYPUS : *Gossweiler 3469*, Angola (holo-, LISJC; iso-, K!).

Medium tall, robust, tufted perennial herb, without runners; stem (15-)30-60 cm high, (0.7-)1-2.3 mm diam. Inflorescence 8-20 mm diam., thick and ± spherical, yellowish to orange or even dark brown, very rarely pale yellow to whitish; all glumes ± elongated, about equally long. — Pl. 1, *6-11*.

AFRICA : south-eastern soudano-zambesian, Tanzania, Zaire, Angola, Zambia.

var. **floribunda** P. Goetghebeur, *var. nov.*

Differt a var. protea *capitulis crassis, floribundis, (10-)12-15 mm diam. et glumis turgidis nitentibusque.*

TYPUS : *Gérard 3873*, Zaire (holo-, BR!).

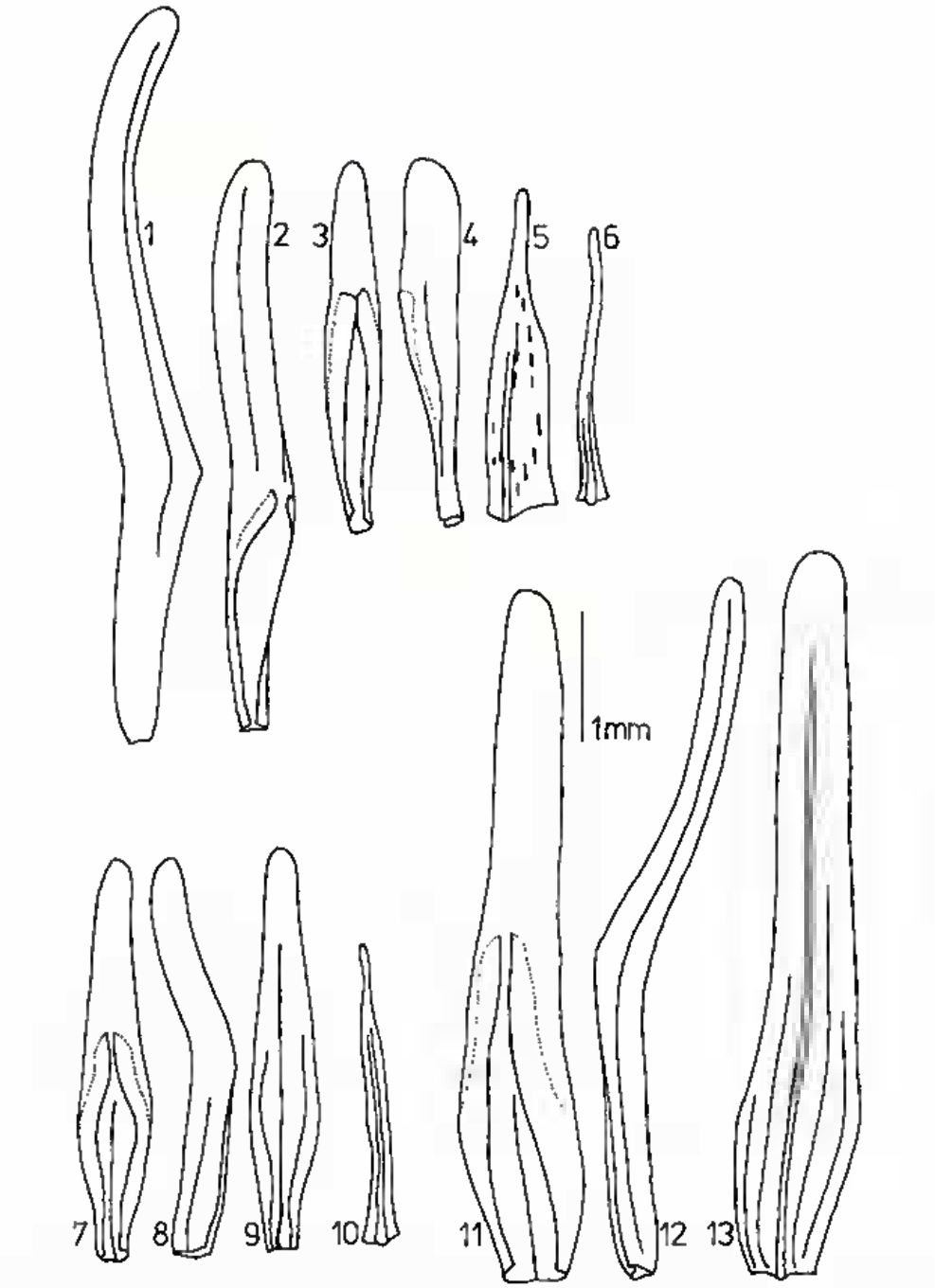
Small to medium high, tufted ± robust herb; stem 15-40 cm high, 0.6-1.2 mm diam. Inflorescence capitate, the single spike (10-)12-15 mm diam., thick, densely many-flowered; glumes whitish, turgid, beautifully shining. — Pl. 2, *1-4*.

AFRICA : northern soudano-zambesian, Guinea, Centrafrique, Zaire.

var. **anthemidiflora** Welw.

Trans. Linn. Soc. 27 : 78 (1869) (' *anthemiflora* ').
Antrolepis anthemiflora WELW., Apont. : 578 (1859), *nom. provis.*; *Ascolepis anthemiflora* WELW., Trans. Linn. Soc. 27 : 77, *tab. 24, fig. 9-13* (1869).

TYPUS : *Welwitsch 1669*, Angola (holo-, BM!; iso-, K!).



Pl. 3. — **Ascolepis protea** Welw. var. **bellidiflora** Welw. (1-6 from *Welwitsch 1668*, BM; 7-13 from *Welwitsch 1664*, BM) : **1**, outer glume laterally; **2**, outer glume ventrally; **3**, inner glume ventrally; **4**, inner glume laterally; **5**, outer bract dorsally; **6**, inner bract dorsally; **7**, inner glume ventrally; **8**, inner glume laterally; **9**, inner glume dorsally; **10**, inner bract dorsally; **11**, outer glume ventrally; **12**, outer glume laterally; **13**, outer glume dorsally.

Medium tall tufted perennial herb, without runners; stem 10-50 cm high, 0.6-1.1 mm diam. Inflorescence (10-)15-25 mm diam., ± flattened, whitish to yellowish orange; marginal glumes elongated, apical part ± dorsoventrally flattened, tip broadly rounded, central glumes not or only slightly elongated. — Pl. 2, *5-9*.

AFRICA : south-eastern soudano-zambesian, Tanzania, Zaire, Angola, Zambia, Malawi.

var. **bellidiflora** Welw.

Trans. Linn. Soc. 27 : 76 (1869).
≡ *Antrolepis leucocephala* WELW., Apont. : 578 (1859), *nom. provis.*
≡ *Ascolepis bellidiflora* (WELW.) CHERM., Arch. Bot. Caen 4 (7) : 29 (1931).
— *Antrolepis elata* WELW., Apont. : 578 (1958), *nom. provis.*
— *Ascolepis elata* WELW., Trans. Linn. Soc. 27 : 79 (1869); typus : *Welwitsch 1670*, Angola (holo-, BM!; iso-, K!).
— *Antrolepis santolina* WELW., Apont. : 578 (1859), *nom. provis.*
— *Ascolepis protea* WELW. var. *santolinoides* WELW., Trans. Linn. Soc. 27 : 77 (1869); lectotypus : *Welwitsch 1664*, Angola, BM!; iso-, K!
— *Antrolepis sulphurea* WELW., Apont. : 578 (1859), *nom. provis.*; typus : *Welwitsch 1666*, Angola (holo-, BM!; iso-, K!).
— *Ascolepis elata* WELW. var. *gracilior* C.B. CLARKE, *in* DURAND & SCHINZ, Consp. Fl. Afr. 5 : 652 (1894), *nom. nud.*; typus : *Mechow 332*, Angola (holo-, K; iso-, Z!).
— *Ascolepis protea* WELW. var. *transiens* KÜK., *in* PETER A., Repert. Sp. Nov., Beih. 40 (1), Anhang : 123 (1936); syntypi : *Peter 34240, 37151*, Tanzania, B!
— *Ascolepis protea* WELW. var. *tuberosa* KÜK., *in* PETER A., *l.c.* : 124 (1936); typus : *Peter 38801*, Tanzania (holo-, B!).

LECTOTYPUS : *Welwitsch 1668*, Angola, BM!; iso-, K!

Small to medium tall tufted perennial herb, very rarely provided with runners; stem (5-)15-50(-60) cm high, 0.6-1.3 mm diam. Inflorescence rather variable, 10-40 mm diam.; marginal glumes slightly to very elongated, central glumes not or moderately elongated. — Pl. 3.

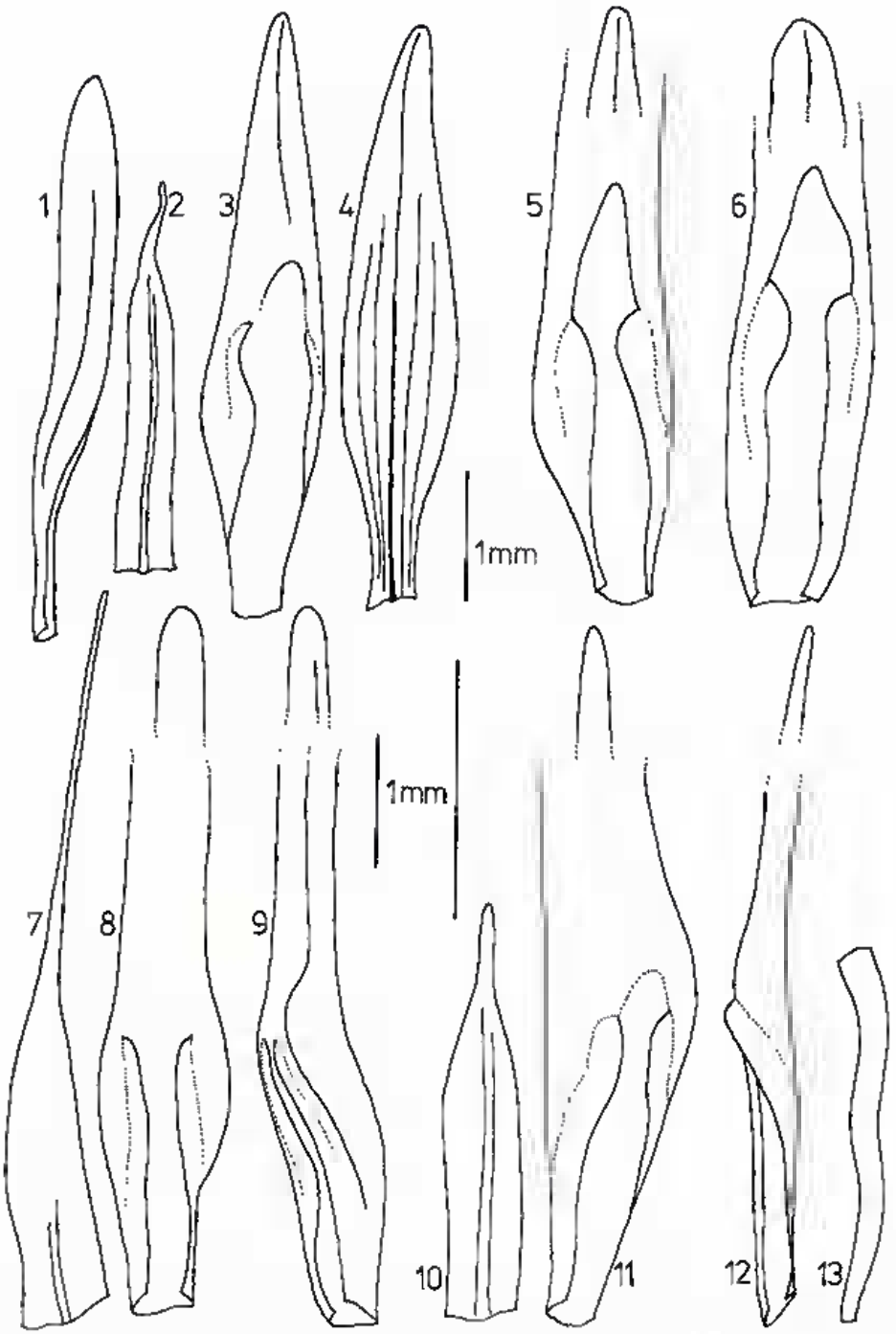
AFRICA: soudano-zambesian, from Nigeria to Ethiopia, S extending to Rhodesia.

var. **stellata** P. Goetghebeur, *var. nov.*

Differt a var. protea *capitulis complanatis, 15-30 mm diam., bracteis involucralibus multis radiantibus circumdatis, et glumis marginalibus modice vel valde elongatis.*

TYPUS : *Wild 7684*, Rhodesia (holo-, SRGH!; iso-, K!, L!, P!).

Low to medium tall, robust, tufted perennial herb, without runners; stem (5-)15-40(-60) cm high, (0.5-)1-2 (-2.2) mm diam. Inflorescence



Pl. 4. — **Ascolepis protea** Welw. var. **stellata** P. Goetghebeur (*Schmutz 6021*, BR) : **1,** inner glume laterally, **2,** inner bract dorsally; **3,** inner glume ventrally; **4,** inner glume dorsally; **5,** outer glume ventrally; **6,** larger outer glume ventrally. — var. **splendida** K. Schum. (7-9 from *Bequaert 373*, BR; 10-13 from *Quarré 1516*, BR) : **7,** bract dorsally; **8,** glume ventrally; **9,** glume laterally; **10,** bract dorsally; **11,** glume ventrally; **12,** glume laterally; **13,** filament.

15-30 mm diam., ± flattened, surrounded by relatively many ± radiate involucral bracts; marginal glumes moderately to very elongated, ± wrinkled or curved when dry, central glumes not or only slightly elongated. — Pl. 4, *1-6*.

AFRICA: southern soudano-zambesian, Zaire, Angola, Zambia, Rhodesia.

var. **splendida** K. Schum.

in WARBURG, Kunene-Sambesi Exp. : 177 (1903).

TYPUS : *Baum 158*, Rhodesia? (part of holo-, B!; iso-, BM!, K!, Z!).

Small to medium tall, ± tufted perennial herb, without runners; stem 10-50 cm high, 0.7-1.2 mm diam. Inflorescence (15-)25-35(-50) mm diam., ± spherical; all glumes about equally long, the apical part very elongated, giving the head a most beautiful appearance. — Pl. 4, *7-13*.

AFRICA: soudano-zambesian, from Nigeria to Sudan, S extending to Rhodesia.

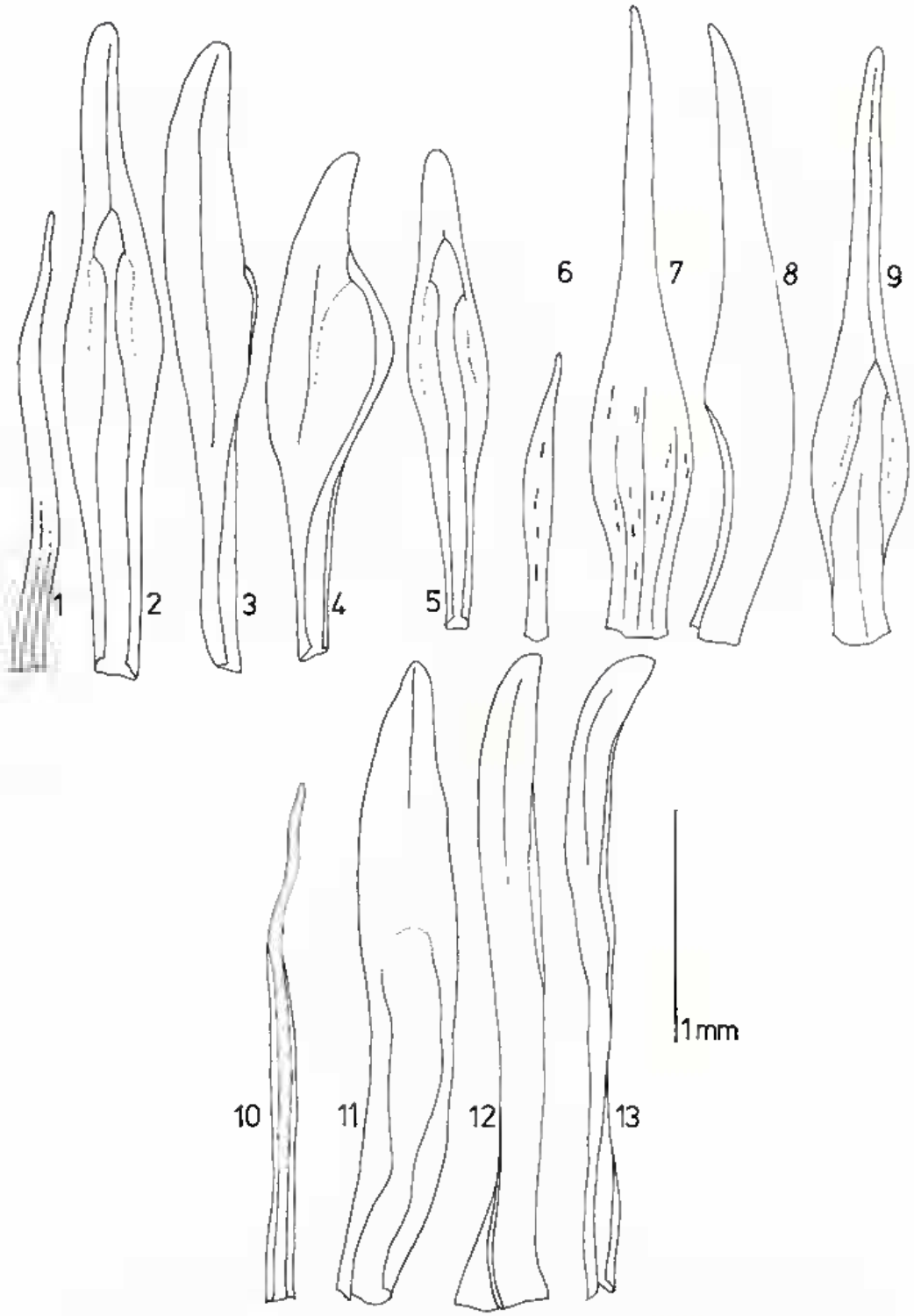
2. **Ascolepis metallorum** P. Duvigneaud & G. Léonard

Bull. Soc. Roy. Bot. Belg. 90 : 268 (1958).

TYPUS : *Duvigneaud 3061*, Zaire (holo-, BRLU).

Tufted, slender *perennial* herb; stem base slightly bulbously thickened, covered by a sometimes dense mass of pale brown fibrous leaf sheath remnants; stem 10-20 cm high, 0.3-0.7 mm diam. *Inflorescence* capitate, the solitary spike 5-8 mm diam., often dark-coloured, ± brownish white, spheroidal, marginal glumes not or only slightly elongated; larger involucral bracts 3-4, reflexed, up to 7 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract ca. 2 mm long, linear, ± hyaline, upper part terete, tip subacute; glume 2.5-3.5 mm long, laterally compressed, basal part ca. 1.75 mm long, concave, ± hyaline, 3-nerved, floral parts adaxially enclosed by the glume wings, apical part 0.5-1.5 mm long, whitish to brownish, often somewhat incurved, tip subacute; stamens 3, lateral and anterior, filament up to 2 mm long, anther ca. 1 mm long; style 1.5-2 mm long, deeply 3-cleft; fruit 0.75 mm long, obovate, obscurely trigonous, dark reddish brown. — Pl. 5, *1-5*.

AFRICA: Zaire (Shaba).



Pl. 5. — **Ascolepis metallorum** P. Duvign. & G. Léonard (*Mbaku 105*, BRVU) : **1,** bract dorsally; **2,** outer glume ventrally; **3,** outer glume laterally; **4,** inner glume laterally; **5,** inner glume ventrally. — **Ascolepis eriocauloides** (Steud.) Nees ex Steud. (*Schimper 1195*, BM) : **6,** bract dorsally; **7,** glume dorsally; **8,** glume laterally; **9,** glume ventrally. — **Ascolepis hemisphærica** Peter ex P. Goetghebeur (*Peter 38250*, B) : **10,** bract dorsally; **11,** glume ventrally; **12** & **13,** glume laterally.

3. **Ascolepis eriocauloides** (Steud.) Nees ex Steud.

Syn. Pl. Glum. 2 : 105 (t855).
≡ *Kyllingia eriocauloides* STEUD., Flora 25 : 597 (t842).
≡ *Isolepis ascolepis* A. RICH., Tent. Fl. Abyss. 2 : 501 (1851), *nom. superfl.*

TYPUS : *Schimper 1195*, Ethiopia (holo-, P!; iso-, B!, BM!, BR!, L!).

Loosely tufted, small and slender *perennial* herb; stem base slightly bulbously thickened, covered by a few brownish leaf sheaths, at last becoming fibrous; stem 5-20 cm high, 0.4-0.7 mm diam. *Inflorescence* capitate, the solitary spike 5-10 mm diam., spheroidal, whitish, marginal glumes not elongated; larger involucral bracts 3, reflexed, up to 8 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 1-1.25 mm long, narrowly triangular to linear, whitish hyaline, red dotted, tip subacute to rounded; glume 2-3 mm long, basal part 1 mm long, very concave, hyaline, nerves poorly developed, floral parts adaxially enclosed by the glume wings, middle part much inflated, apical part 1-2 mm long, narrowly subterete, whitish, rounded at the tip; stamen 1, lateral, filament ca. 1.5 mm long, anthers not seen; style 1 mm long, deeply (2-)3-cleft; fruit 0.7 mm long, obovate, subtrigonous, dark red brown. — Pl. 5, *6-9*.

AFRICA: Ethiopia.

NOTE: Since this species only occurs in Ethiopia, all other African records are concerning resembling taxa, such as *A. protea* var. *protea*, *A. densa*, *A. hemisphærica*, ...

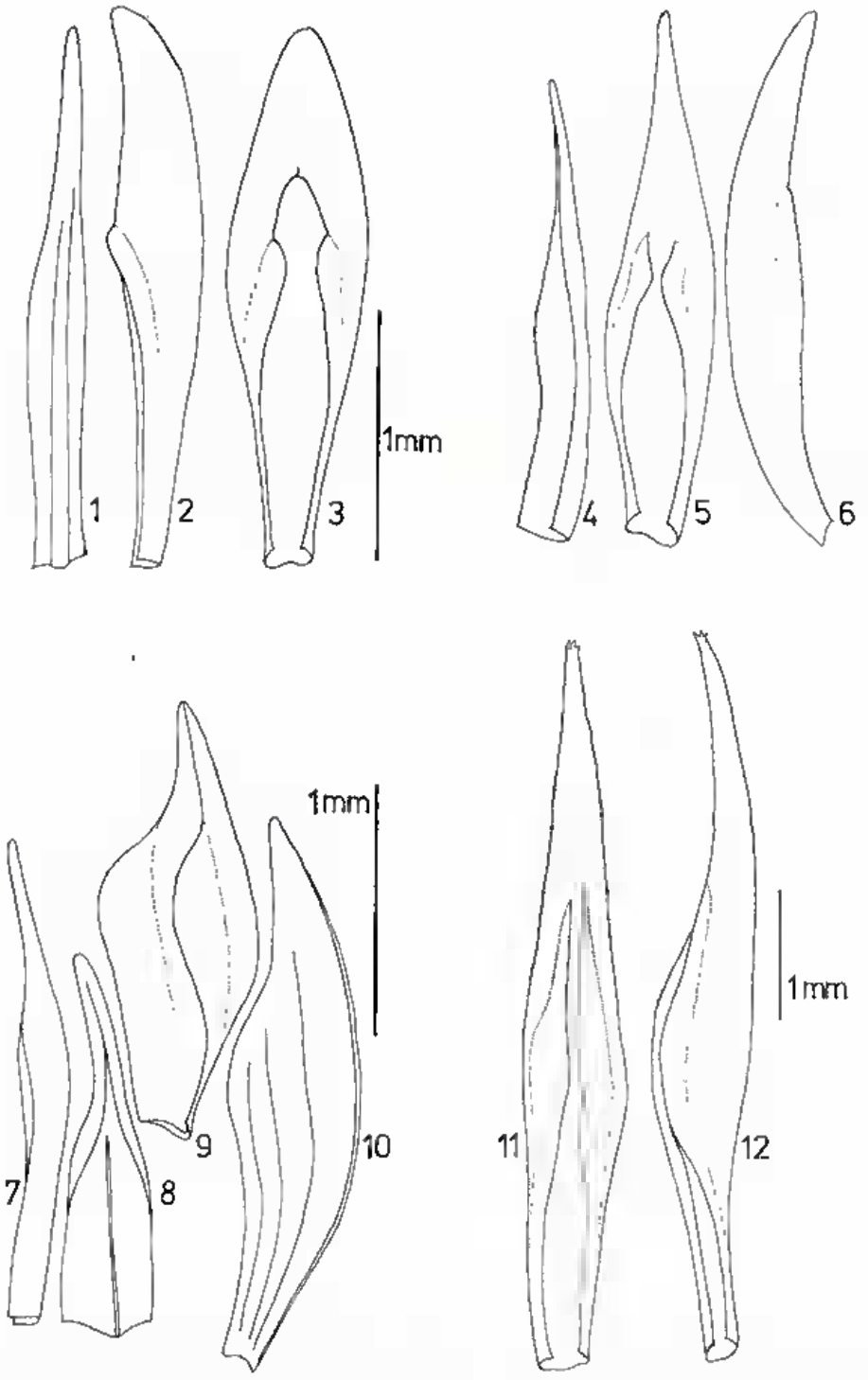
4. **Ascolepis hemisphærica** Peter ex P. Goetghebeur, *sp. nov.*

PETER, Abh. Ges. Wiss. Göttingen, Math. - Phys. Kl., n. F. 13 : tt1 (1928), *nom. nud.*

Ab A. protea *inflorescentia maxime densa, 6-13 mm diam., laminarum basibus subplanis atque stolonibus gracilibus subterraneis satis distincta.*

LECTOTYPUS : *Peter 38250*, Burundi, B!; iso-, K!, P!

Tufted, somewhat slender *perennial* herb; stem base slightly thickened, covered by a few withering ± fibrous leaf sheaths, very often (always?) provided with slender underground runners, their internodes about 1 cm long, their nodes each with a bladeless cataphyll; stem 3-35 cm high, 0.5-1.2 mm diam.; leaves ca. 2 mm broad, often ± flattened out at the base of the blade. *Inflorescence* capitate, the solitary spike 6-13 mm diam., whitish, ± spheroidal, marginal glumes not elongated; larger involucral



Pl. 6. — **Ascolepis trigona** P. Goetghebeur (*Robinson 6053*, BRVU) : **1,** bract dorsally; **2,** glume laterally; **3,** glume ventrally. — **Ascolepis densa** P. Goetghebeur (*Lisowski, Malaisse & Symoens 9803*, BR): **4,** bract ventrally; **5,** glume ventrally; **6,** glume laterally. — **Ascolepis pseudopeteri** P. Goetghebeur (*Simon & Williamson 1991*, SRGH) : **7,** bract laterally; **8,** bract ventrally; **9,** glume ventrally; **10,** glume laterally. — **Ascolepis spinulosa** P. Goetghebeur (*Cabu s.n.*, BR) : **11,** glume ventrally; **12,** glume laterally.

bracts 3(-4), up to 7 cm long, often flattened out at the base of the blade; spikelets very densely spirally imbricate on a broadly conical axis. *Spikelet* bract 2.5-3.5 mm long, narrowly triangular to linear, whitish-hyaline, upper part terete, tip subacute; glume ca. 3-4 mm long, basal part ca. 2 mm long, very thin and hyaline, nerves poorly developed, floral parts adaxially only slightly enclosed by the rather narrow glume wings, apical part ca. 1-2 mm long, whitish, thick, triangular or dorsoventrally flattened, tip rounded to subacute; stamens 2-3, lateral and anterior, filament up to 1.5 mm long, anther ca. 1 mm long; style 1-3 mm long, deeply 3-cleft; fruit ca. 1 mm long, obovate, obscurely subtrigonous, dark red brown. — Pl. 5, *10-13*.

AFRICA: Tanzania, Burundi.

NOTE: PETER (1928 : 111) writes only : " *Ascolepis hemisphærica* n. spec. Ujiji. Urundi. " These localities concern resp. the numbers *37225* and *38250*, both with a label and the name, but without description. *Peter 38250* is our new species. PETER had clearly the intention te create a new taxon, different from *A. protea* var. *bellidiflora*, therefore it seems reasonable to indicate *Peter 38250*, a well-grown specimen, as type of *A. hemisphærica*.

5. **Ascolepis densa** P. Goetghebeur, *sp. nov.*

Ab A. protea *inflorescentia maxime densa, 5-8 mm diam., ab* A. hemisphærica *laminis involutis, stolonum absentia satis differt.*

TYPUS : *Robinson 2814*, Zambia (holo-, SRGH!; iso-, K!, P!).

Tufted, small and slender *perennial* herb; stem base bulbously thickened, covered by a few withering leaf sheaths; stem 10-40 cm high, 0.3-0.7 mm diam. *Inflorescence* capitate, the solitary spike 5-8 mm diam., whitish, ± spheroidal, marginal glumes not elongated; larger involucral bracts 2(-3), up to 6 cm long; spikelets very densely spirally imbricate on a broadly conical axis. *Spikelet* bract 1.5-2.3 mm long, narrowly triangular, whitish-hyaline, upper part terete, tip subacute; glume 1.8-3.4 mm long, basal part ca. 1 mm long, concave, hyaline, nerves poorly developed, floral parts adaxially enclosed by the glume wings, apical part ca. 1-2 mm long, whitish, narrowly triangular, tip subacute; stamens 2, lateral, filament up to 2 mm long, anther 0.6-1 mm long; style 1.5 mm long, deeply 3(-4)-cleft; fruit 0.5 mm long, obovate, subtrigonous, dark red brown. — Pl. 6, *4-6*.

AFRICA: south-eastern soudano-zambesian, Tanzania, Zaire, Angola, Zambia, Rhodesia.

6. **Ascolepis trigona** P. Goetghebeur, *sp. nov.*

Ab A. protea *inflorescentia maxime densa, 5-7 mm diam., ab* A. densa *gluniæ parte apicali triangulari, dorsiventraliter complanata, apice rotundato satis differt.*

Typus : *Robinson 4253*, Zambia (holo-, SRGH!; iso-, BR!, K!, P!).

Loosely tufted, small and slender *perennial* herb; stem base slightly bulbously thickened, surrounded by a few withering leaf sheaths; stem 10-25 cm high, 0.3-0.6 mm diam. *Inflorescence* capitate, the solitary spike 5-7 mm diam., spheroidal, whitish or yellowish, marginal glumes not elongated; larger involucral bracts 2-4, up to 6 cm long, often reflexed; spikelets very densely spirally imbricate on a broadly conical axis. *Spikelet* bract ca. 2 mm long, narrowly triangular to linear, whitish or yellowish, tip subacute to rounded; glume 2-3 mm long, basal part 1.3-1.6 mm long, very concave, ± hyaline, nerves 3, floral parts adaxially ± enclosed by the glume wings; apical part 0.5-1 mm long, whitish or yellowish with shiny, inflated surface cells, dorsiventrally flattened, plump triangular, rounded at the tip; stamens 3, lateral and anterior, filament ca. 1.75 mm; anther ca. 1 mm long; style 1-1.7 mm long, deeply 3(-4)-cleft; ripe fruit not seen. — Pl. 6, *1-3*.

Africa: Zaire, Zambia.

7. **Ascolepis pseudopeteri** P. Goetghebeur, *sp. nov.*

Ab A. protea *inflorescentia minima, 4-6 mm diam., gluniæ parte apicali sectione lunari, ab* A. trigona *glumis ± patentibus habituque satis differt.*

Typus : *Simon & Williamson 1991*, Zambia (holo-, SRGH!; iso-, K!, P!).

Loosely tufted, small and slender *perennial* herb; stem base slightly thickened, surrounded by a few ± withering leaf sheaths; stem 5-15 cm high, 0.2-0.5 mm diam.; leaves relatively abundant. *Inflorescence* capitate, the solitary spike 4-6 mm diam., spheroidal, yellow to orange-brown, marginal glumes not elongated; larger involucral bracts 2-3, up to 5 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 1.5-2 mm long, lanceolate, yellow to orange-brown, tip subterete; glume 1.7-2.3 mm long, basal part 1-1.5 mm long, ± concave, the middle part swollen, floral parts adaxially enclosed by the glume wings, apical part 0.5-0.75 mm long, yellow to orange-brown, with shiny ± inflated surface cells, crescent-shaped on section; stamens (2-)3, lateral and anterior, filament ca. 1.7 mm, anther ca. 1 mm long; style ca. 1 mm long, deeply 3(-4)-cleft; ripe fruit 0.75 mm long, obovate, obscurely subtrigonous, dark red brown. — Pl. 6, *7-10*.

Africa: Zambia.

8. **Ascolepis spinulosa** P. Goetghebeur

Bull. Nat. Plantentuin Belg. 47 : 438 (1977).

TYPUS : *Cabu s.n.*, Zaire (holo-, BR!).

Small, tufted *perennial* herb; stem base bulbously thickened, covered by dark red brown to blackish leaf sheaths, at last becoming fibrous; stem 5-20 cm high, 1 mm diam.; leaves rather thick. *Inflorescence* capitate, the solitary spike 7-10 mm broad, hemispherical, yellowish white, marginal glumes not elongated; larger involucral bracts 2-3, up to 6 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 4-5 mm long, narrowly ovoidal, whitish-hyaline, 3(-5)-nerved, nerves pale brown, top minutely spinulose; glume 4.5-5.5 mm long, basal part 3-3.5 mm long, very concave, hyaline, nerves prominent, pale brown, floral parts adaxially enclosed by the glume wings, apical part 1.5-2 mm long, subrhombic on cross-section, yellowish white, minutely spinulose at the tip; stamens 3, lateral and anterior, filament up to 2.7 mm, anther ca. 1.5 mm long; style 3 mm long, deeply 3-cleft; ripe fruit 1.25 mm long, obovate, subtrigonous, dark red brown. — Pl. 6, *11-12*.

AFRICA: Zaire.

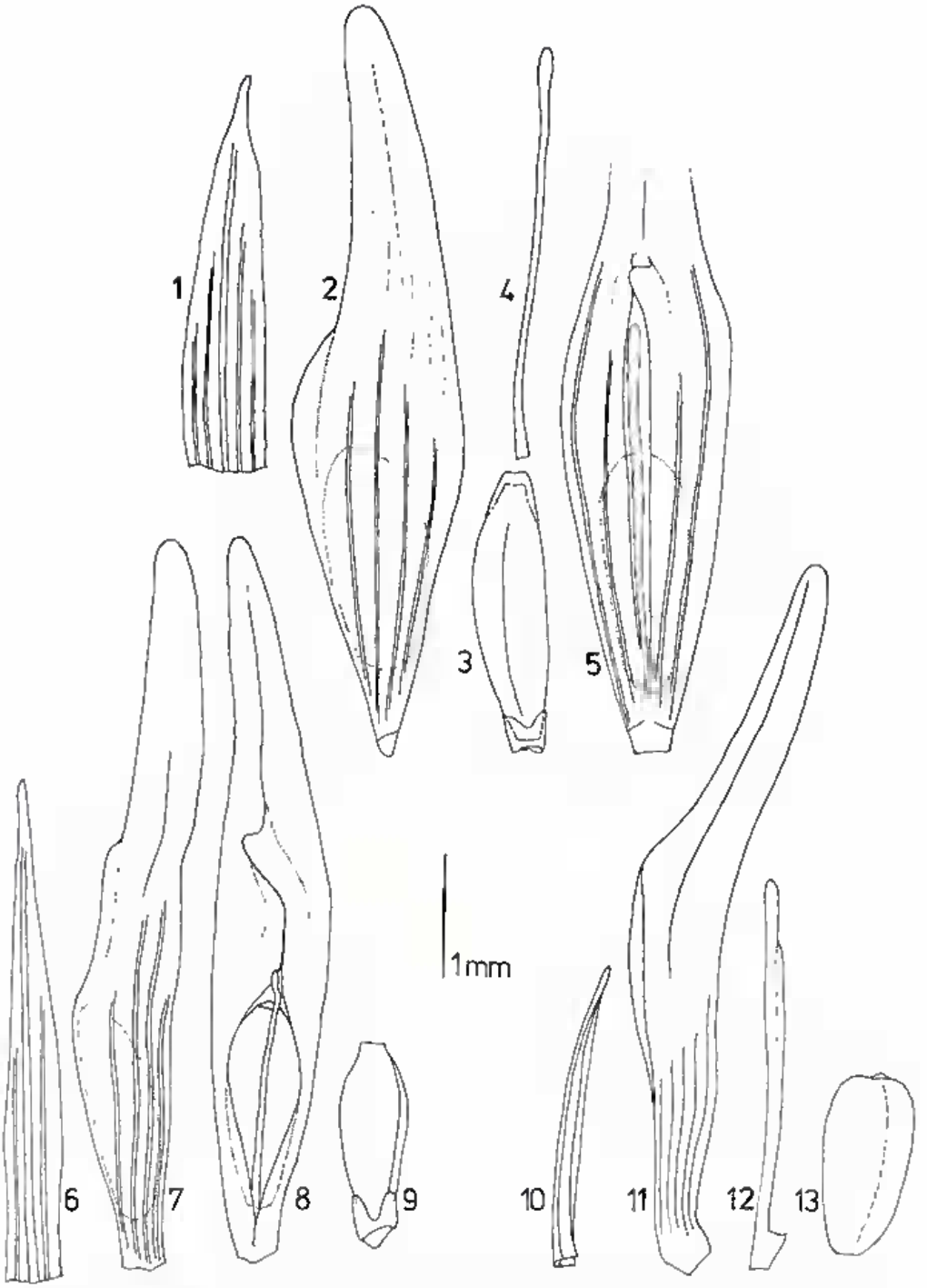
9. **Ascolepis neglecta** P. Goetghebeur

Bull. Nat. Plantentuin Belg. 47 : 441 (1977).

TYPUS : *Risopoulos 389*, Zaire (holo-, BR!; iso-, P!).

Slender, tufted *perennial* herb; stem base bulbously thickened, covered by a dense coat of red brown to dark brown leaf sheaths at last becoming fibrous; stem 40-50 cm high, 0.8-1 mm diam. *Inflorescence* capitate, the solitary spike 15-20 mm diam., hemispherical, ± pale brown, all glumes ± elongated; larger involucral bracts 2-3, up to 9 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 2.5-3 mm long, narrowly triangular to linear, hyaline, central nerve prominent, reddish brown, tip subacute; glume 6-9 mm long, often laterally compressed, basal part ca. 3 mm long, very concave, hyaline, reddish nerved, floral parts adaxially enclosed by the glume wings, apical part 3-6 mm long, ± pale brown, tip subacute; stamens 3, lateral and anterior, filament ca. 3.5 mm, anther 1.5-1.8 mm long; style up to 2.5 mm long, deeply 3-cleft; fruit 1.5 mm long, obovate, subtrigonous, brownish; rhachilla up to 3 mm long, linear, hyaline with a whitish central nerve; apical part subterete, completely enclosed by the first glume wings, ± persistent. — Pl. 7, *10-13*.

AFRICA: Zaire.



Pl. 7. — **Ascolepis fibrillosa** P. Goetghebeur (1-3 from *Lynes 330 d*, BR; 4-5 from *Devred 1517*, BR) : **1**, bract dorsally; **2**, glume laterally; **3**, fruit dorsally; **4**, rhachilla; **5**, glume ventrally (wings somewhat opened to show the rhachilla). — **Ascolepis speciosa** Welw. (*Welwitsch 1674*, BM) : **6**, bract dorsally; **7**, glume laterally; **8**, glume ventrally (wings somewhat opened to show the rhachilla); **9**, fruit. — **Ascolepis neglecta** P. Goetghebeur (*Risopoulos 389*, BR) : **10**, bract laterally; **11**, glume laterally; **12**, rhachilla on the short spikelet pedicel; **13**, fruit.

10. **Ascolepis fibrillosa** P. Goetghebeur

Bull. Nat. Plantentuin Belg. 47 : 439 (1977).

Typus : *Devred 1517*, Zaire (holo-, BR!; iso-, BRVU!, K!, P!).

Robust, tufted *perennial* herb; stem base bulbously thickened, covered by a dense fibrous coat of withered leaf sheaths; stem 40-70 cm high, 1-1.5 mm diam. *Inflorescence* capitate, the solitary spike 15-20(-25) mm diam., spheroidal, yellowish white, all glumes ± elongated; larger involucral bracts 3-4, up to 12 cm long; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 3-4.5 mm long, narrowly triangular, whitish hyaline, with a pale brown central nerve, tip subterete; glume 6-10 mm long, middle part inflated, often laterally compressed, basal part 3-4 mm long, very concave, hyaline, all nerves very prominent, reddish brown, floral parts adaxially enclosed by the glume wings, apical part 3-7 mm long, yellowish white, subtrigonous to subrhombic, rounded at the tip; stamens 3-5, lateral and anterior, filament 3-4 mm long, anthers not seen; style ca. 2 mm long, deeply 3(-5)-cleft; fruit 2 mm long, obovate, subtrigonous, dark red brown, basal epidermal cells inflated; rhachilla 2.5-3 mm long, whitish hyaline, reddish brown at the base, subterete, slightly thickened to narrowly winged at the tip, completely enclosed by the glume wings, ± persistent. — Pl. 7, *1-5*.

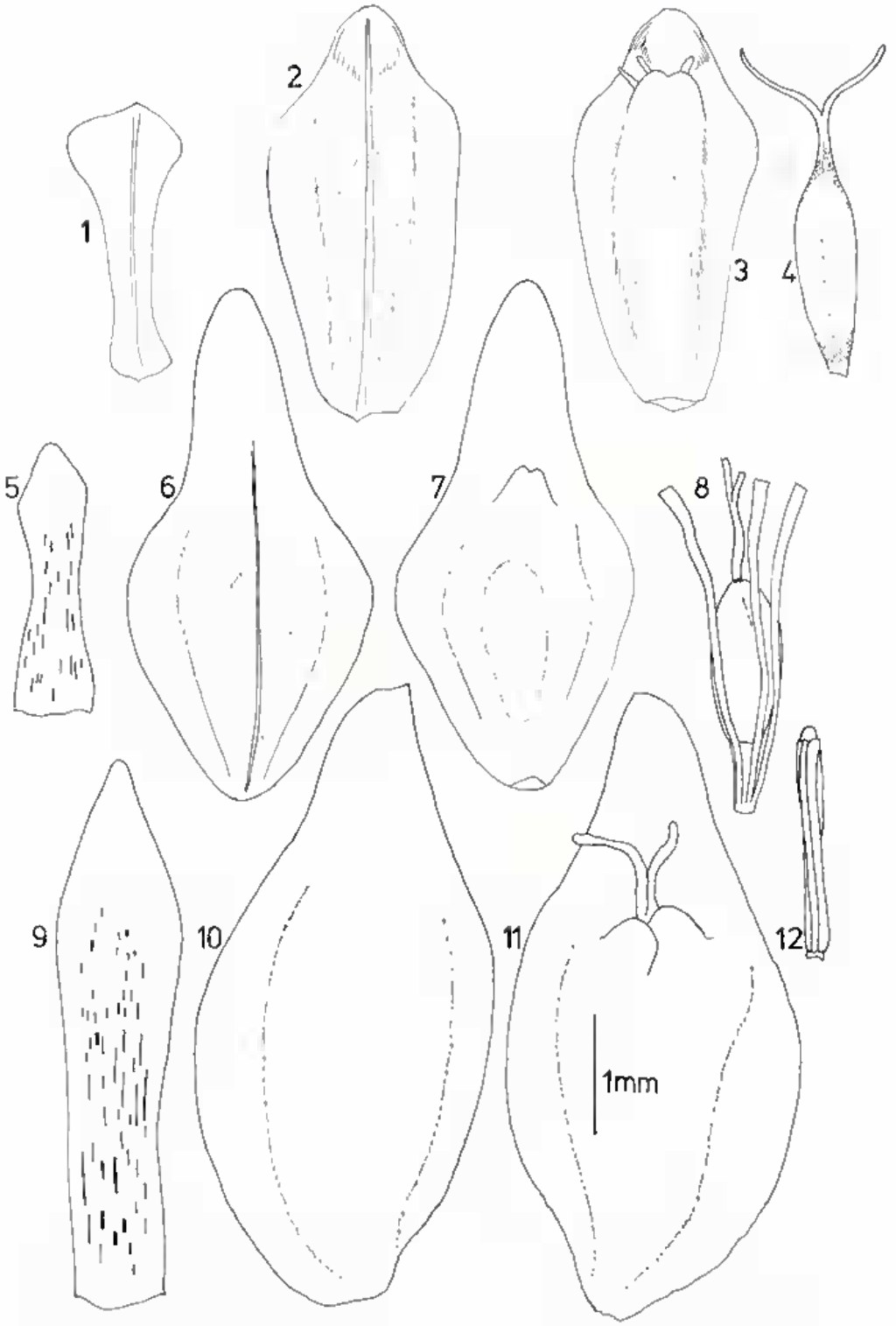
Africa: Zaire, Angola, Zambia.

11. **Ascolepis speciosa** Welwitsch

Trans. Linn. Soc. 27 : 78 (1869).

Typus : *Welwitsch 1674* (holo-, BM!; iso-, K!).

Robust, tufted *perennial* herb; stem base bulbously thickened, covered by a dense mass of ribbon-like leaf sheath remnants; stem 15-40 cm high, 2-3 mm diam. *Inflorescence* capitate, the solitary spike 15-25 mm diam., orange to brownish red, spheroidal, all glumes ± elongated; larger involucral bracts 3-4, up to 7 cm long; spikelets densely spirally imbricate on a broadly truncate axis. *Spikelet* bract ca. 4 mm long, narrowly triangular, orange-hyaline, prominently nerved; glume 6-9 mm long, middle part inflated, laterally compressed, basal part ca. 4 mm long, concave, orange-hyaline, all nerves prominent, floral parts adaxially enclosed by the glume wings, apical part 2-5 mm long, orange to brownish red, laterally compressed, tip rounded to subacute; stamens 3, lateral and anterior, filament up to 3.5 mm long, anther not seen; style not seen; fruit ca. 1.5 mm long, obovate, subtrigonous, dark red brown, basal epidermal cells inflated; rhachilla ca.



Pl. 8. — **Ascolepis capensis** (Kunth) Ridl. (1-4 from *Symoens 11230*, BRVU; 5-8 from *de Wilde e.s. 6846*, WAG; 9-12 from *Moss 5470*, BM) : **1**, bract dorsally; **2**, glume dorsally; **3**, glume ventrally; **4**, fruit; **5**, bract dorsally; **6**, glume dorsally; **7**, glume ventrally; **8**, young fruit surrounded by three filaments; **9**, bract dorsally; **10**, glume dorsally; **11**, glume ventrally; **12**, anther.

2 mm long, orange, subterete, slightly thickened at the tip, completely enclosed by the glume wings, ± persistent. — Pl. 7, *6-9*.

AFRICA: Angola (type-locality only).

12. **Ascolepis capensis** (Kunth) Ridley

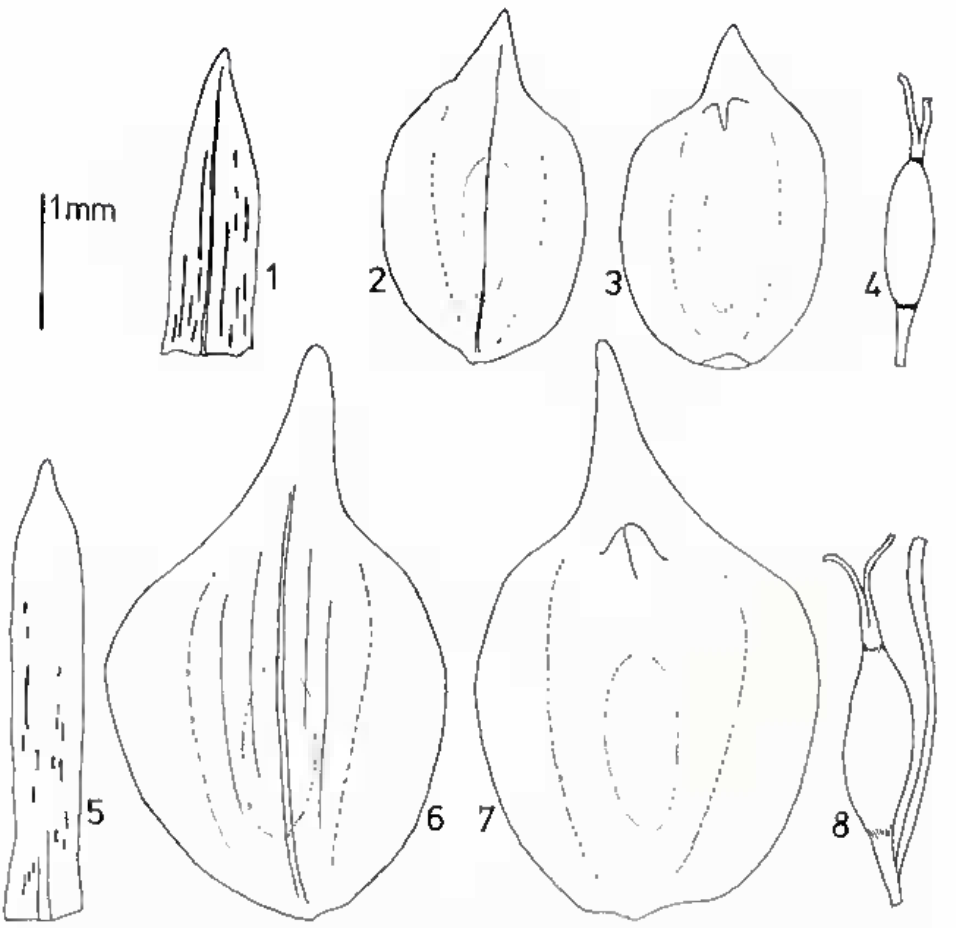
Trans. Linn. Soc., ser. 2, Bot., 2 : 164 (1884).
≡ *Platylepis capensis* KUNTH, Enum. 2 : 269 (1837).
— *Platylepis dioica* STEUD., Syn. Pl. Glum. 2 : 131 (1854); typus : *Drège 3953*, South Africa (holo-, P!).
— *Ascolepis capensis* (KUNTH) RIDLEY var. *lacera* C.B. CLARKE, *in* DURAND & SCHINZ, Consp. Fl. Afr. 5 : 651 (1894); typus : *Barter s.n.*, Nigeria (holo-, K!).

TYPUS : *Drège 4389*, South Africa (iso-, P!).

Tufted *perennial* herb on an ascending rhizome, often provided with slender underground runners; stem base slightly bulbously thickened covered by dark brown to blackish fibrous leaf sheaths; the yellowish to reddish underground runners are breaking through the mass of leaf sheaths, their internodes 0.5-1.5 cm long, their nodes bearing small or sometimes well developed cataphylls; stem 20-60 cm high, 0.5-1.3 mm diam. *Inflorescence* composed of 1-4 (-6) spikes, creamish white, ± spheroidal, 6-10 mm long, marginal glumes not or only slightly elongated; larger involucral bracts 2, up to 6 cm long; spikelets densely spirally imbricate on a broadly conical axis or sometimes on slender cylindrical pale brown axes. *Spikelet* bract 2-3.5 mm long, ± spathulate, hyaline and red-dotted, 1-nerved; glume 3.5-5.5(-7) mm long, dorsiventrally compressed, the margins adaxially connate, with an adaxial 2-cleft valve at the top of the basal part, basal part 2.5-3 mm long, obovate to rhombic, thicker part often reddish brown, 1-3-nerved, the thin lateral wings whitish hyaline, 0.25-0.5 mm broad, apical part 0.5-3(-5) mm long, not sharply differentiated from the basal part, whitish, slightly swollen, ± broadly triangular, obtuse to rounded at the tip; stamens 2-3, lateral and anterior, filament 2.5-3 mm, anther 1-2 mm long; style 1-2 mm long, deeply 2-cleft; fruit 1-1.5 mm long, narrowly obovate, ± lenticular, dark red brown on a whitish stipe 0.2-0.6 mm long. — Pl. 8.

AFRICA: from Mali and Sierra Leone to Ethiopia, S extending to South Africa.

NOTE: The inflorescence structure variates from a single terminal spike in western to a compound inflorescence in eastern, central and southern tropical Africa, but both types do occur there; up till now I haven't seen any *A. capensis* from west tropical Africa with a compound inflo-



Pl. 9. — **Ascolepis brasiliensis** (Kunth) Benth. ex C.B Clarke (1-4 from *Morong 95*, BM; 5-8 from *Steinbach 6862*, BM) : **1**, bract dorsally; **2**, glume dorsally; **3**, glume ventrally; **4**, fruit; **5**, bract dorsally; **6**, glume dorsally; **7**, glume ventrally; **8**, fruit and one filament.

rescence. It is often difficult, especially when dealing with young specimens to decide on a branched whether an unbranched inflorescence; unbranched ones will often show their marginal glumes elongated.

13. **Ascolepis brasiliensis** (Kunth) Benth. ex C.B. Clarke

in DURAND & SCHINZ, Consp. Fl. Afr. 5 : 651 (1894).
Platylepis brasiliensis KUNTH, Enum. 2 : 269 (1873).
— *Platylepis gujanensis* NEES, *in* MART., Fl. Brasil. 2 (1) : 63 (1842); typus : *Schomburgk 109*, Guiana (holo-, W; iso-, BM!, K!, U!).
— *Platylepis leucocephala* NEES, *in* MART., *l.c.* : 63 (1842); syntypi : *Nees ab Esenbeck 1627* & *2617*, Brasil, W.
— *Ascolepis leucocephala* (NEES) L. T. LITEN, *in* FERRI, M.G., Simpós. Cerrado, Univ. S. Paulo : 221 (1963).

— *Platylepis xanthocephala* NEES, *in* MART., *l.c.* : 62 (1842); typus : *Gardner 715*, Brasil (holo-, W; iso-, BM!, K!, P!).
— *Kyllinga decora* STEUD., Syn. Pl. Glum. 2 : 317 (1855); typus : *Schomburgk 109*, Guiana (holo-, B; iso-, BM!, K!, U!, W!).

TYPUS : *Sellow s.n.*, Brasil (iso-, K!, P!).

Slender, loosely tufted *perennial* herb; stem base slightly bulbously thickened, covered by a few reddish brown leaf sheaths; stem 15-50 cm high, 0.6-1 mm diam. *Inflorescence* composed of 1-3(-4) spikes, creamish white to pale yellowish brown, marginal glumes not elongated; apical spike 8-14 mm long, ovoidal, lateral ones 3-8 mm long, more spheroidal; larger involucral bracts 2, up to 7 cm long; spikelets densely spirally imbricate on slender cylindrical pale brown axes. *Spikelet* bract 2.5-3.5 mm long, linear to narrowly triangular, hyaline and red-dotted, 1-nerved; glume 3-4 mm long, dorsiventrally compressed, the margins adaxially connate, with an adaxial 2-cleft valve at the top of the basal part, basal part broadly obovate, 2-3.5 mm long, thicker part ± reddish brown, 1-3-nerved, the thin wings whitish hyaline, 0.5-0.75 mm broad, apical part 0.3-1 mm long, ± sharply differentiated from the basal part, whitish, slightly swollen, narrowly triangular to triangular, tip subacute; stamens 2, lateral, filament 2-2.5 mm long, anthers not seen; style 1-1.5 mm long, deeply 2-cleft; fruit 1-1.25 mm long, narrowly obovate, ± lenticular, dark red brown on a whitish stipe, 0.3-0.7 mm long. — Pl. 9.

AFRICA: western soudano-zambesian, from Senegal to Cameroun. — MADAGASCAR. — SOUTH AMERICA: from Venezuela and the Guyanas to Argentina.

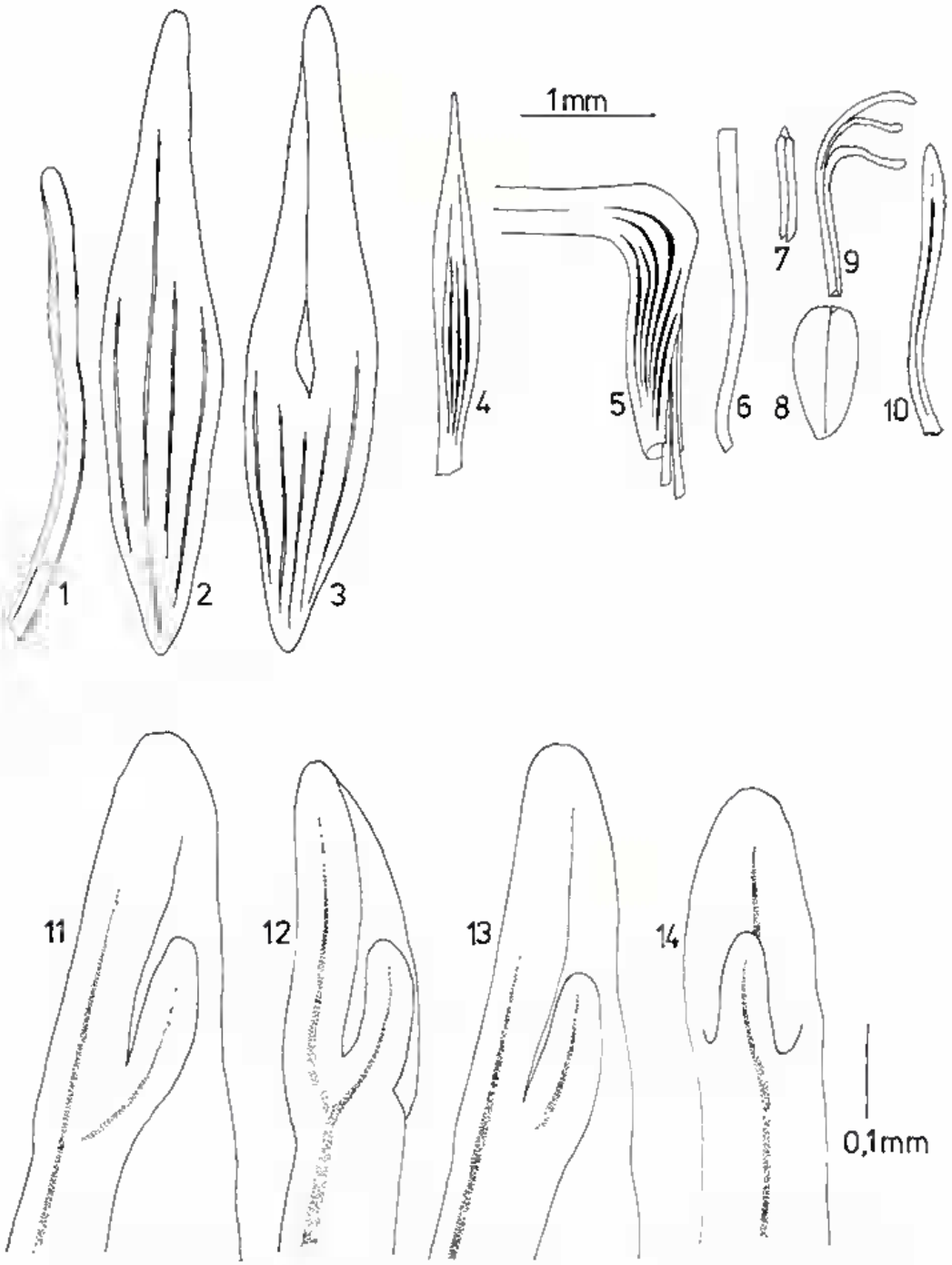
NOTE: This species is easily recognized by its habit and inflorescence, at least in the closely resembling South American and Madagascar specimens; western tropical African plants often simulate *A. capensis* by their smaller apical terminal spikes and more condensed inflorescence; they would differ only by the shape of the spikelet bract and glume, but—a strange coincidence—the western tropical African *A. capensis* always shows a single spike inflorescence, and is by this character easily recognized.

14. **Ascolepis menonguensis** Meneses

Garcia de Orta 4 (2) : 259 (1957).

TYPUS : *Gossweiler 3189*, Angola (holo-, LISJC; iso-, K!).

Robust, tufted *perennial* herb, on a robust ascending rhizome; stem base slightly bulbously thickened, covered by pale brown to red brown leaf sheaths; stem 20-40 cm high, 1-1.8 mm diam., triquetrous near the top; leaves thick, canaliculate and sharply keeled. *Inflorescence* capitate,



Pl. 10. — **Ascolepis menonguensis** Meneses (*Gossweiler 3189*, K) : **1**, bract laterally; **2**, glume dorsally; **3**, glume ventrally. — **Ascolepis pinguis** C.B. Clarke (4-10 from *Lejeune 201*, BR; 11-14 from *Peter 38936*, B) : **4**, bract dorsally; **5**, glume laterally; **6**, filament; **7**, anther; **8**, fruit; **9**, style and stigmas; **10**, rhachilla; **11-14**, rhachilla tip with the surrounding second glume.

the solitary spike creamish white, ± spheroidal, ca. 10 mm diam., marginal glumes not elongated; larger involucral bracts 2, patent, up to 6 cm long; spikelets densely spirally imbricate on a broadly conical pale brown axis. *Spikelet* bract 3-4 mm long, narrowly triangular to linear, ± folded along its midrib, creamish white; glume 4-6 mm long, basal part 2.5-3 mm long, nerves ± prominent, the margins adaxially connate, with an adaxial split at the top of the basal part, apical part 1.5-3 mm long; nerves ± prominent, the margins adaxially connate, with an adaxial split at the top of the basal part, apical part 1.5-3 mm long, narrowly triangular whitish, swollen, rounded at the tip; stamens 4-5, lateral and anterior, filament ca. 3 mm, anther ca. 1 mm long; style 2 mm long, deeply 3-4-cleft; ripe fruit not seen. — Pl. 10, *1-3*.

AFRICA: Angola (type-locality only).

15. **Ascolepis pinguis** C.B. Clarke

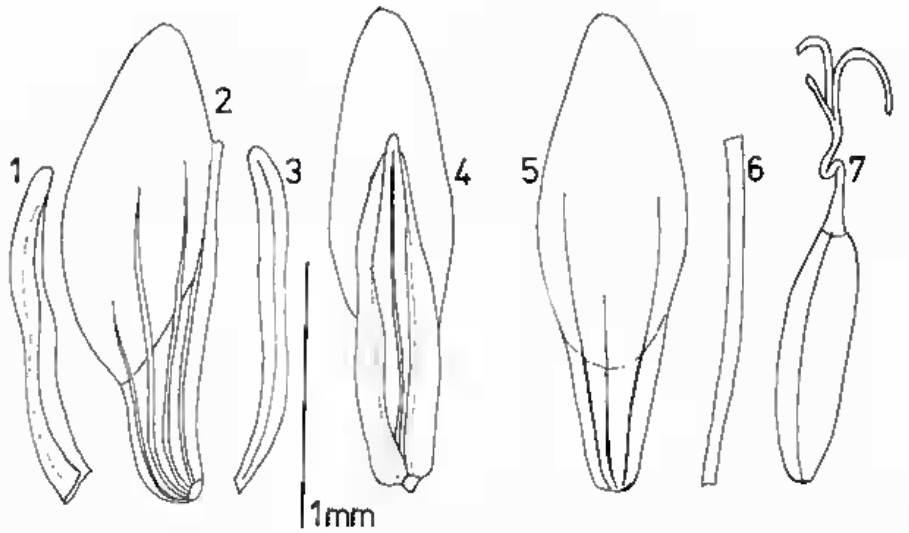
in DE WILDEMAN & DURAND, Ann. Mus. Congo, ser. 2, 1 : 69 (1900).

LECTOTYPUS : *Descamp s.n.*, Zaire, BR!

Very robust, tufted *perennial* herb; stem base bulbously thickened, covered by a dense coat of broad reddish brown to dark brown leaf sheaths, at last becoming ± fibrous; stem 20-60(-80) cm high, 0.8-2 mm diam. *Inflorescence* capitate, the solitary spike 30-50(-60) mm diam., hemispherical, yellowish white to pale yellowish brown, all glumes extremely elongated; larger involucral bracts 2-4, up to 15 cm long, conspicuously reddish nerved at the base; spikelets densely spirally imbricate on a broadly conical axis. *Spikelet* bract 3-3.5 mm long, narrowly ovate-triangular, 3-5-nerved, nerves red brown, wings hyaline, apical part subterete, subacute at the tip; glume 15-25(-30) mm long, ± laterally compressed, basal part 2-3 mm long, very concave, reddish-hyaline, nerves red brown, floral parts adaxially enclosed by the glume wings, apical part 13-22(-27) mm long, almost perpendicular on the basal part, subrhombic on cross section, yellowish white to yellowish brown, subacute at the tip; stamens 2-3, lateral and anterior, filament 2.5-3 mm, anther 1-1.25 mm long; style 1.5-2 mm long, deeply 3-cleft; fruit 1-1.25 mm long, obovate, subtrigonous, pale brownish; rhachilla 2-3 mm long, linear, swollen near the top, hyaline with a red brown central nerve, completely enclosed by the first glume wings, ± persistent. — Pl. 10, *4-10*.

AFRICA: south-eastern soudano-zambesian, Tanzania, Burundi, Congo, Zaire, Zambia.

NOTES: 1. Both syntypes bear a label with '*A. pinguis, sp. nova*' in CLARKE's handwriting, but on the lectotype this label is completed by the



Pl. 11. — **Ascolepis ampullacea** J. Rayn. (*Phipps & Vesey-FitzGerald 3233*, K) : **1**, bract laterally; **2**, glume laterally; **3**, rhachilla; **4**, glume ventrally with the rhachilla partly protruding; **5**, glume dorsally; **6**, the single filament; **7**, fruit, style and stigmas.

short diagnosis, as published. There can be no doubt that both sheets, although badly collected specimens, represent the same taxon.

2. This species is often badly understood and confounded with luxuriant forms of *A. protea* var. *bellidiflora* and *A. protea* var. *splendida*.

3. The thickened upper part of the rhachilla is a compound structure of a small but clearly differentiated second glume surrounding the minute rhachilla tip. — Pl. 10, *11-14*.

16. **Ascolepis ampullacea** J. Raynal

Adansonia, ser. 2, 13 (2) : 159 (1973).

Typus : *Phipps & Vesey-FitzGerald 3233*, Zambia (holo-, NY; iso-, K!, P!, SRGH!).

Slender, loosely tufted *annual;* stem 5-10 cm high, 0.2-0.5 mm diam. *Inflorescence* composed of 2-3 spikes, whitish, marginal glumes not elongated, apical spike ca. 4 mm long, ovoidal, lateral ones ca. 3 mm, more spheroidal; larger involucral bracts 2-3, up to 2 cm long; spikelets densely spirally imbricate on slender cylindrical axes. *Spikelet* bract 1-1.5 mm long, narrowly triangular, hyaline, the central nerve pale brown, thickened at the tip; glume ca. 2 mm long, whitish hyaline, basal part very concave, tightly packed round the fruit, hyaline, prominently ribbed, apical part

inflated, bladder-like, rounded at the tip, conspicuously clear whitish; stamen 1, lateral, filament 1.5 mm long, anther not seen; style ca. 1 mm long, deeply 3-cleft; fruit ca. 1 mm long, oblong, subtrigonous, red brown; rhachilla ca. 1.5 mm long, linear, hyaline, with a narrow central nerve, enclosed by the hyaline first glume wings. — Pl. 11.

AFRICA: Zambia (type-locality only).

17. **Ascolepis pusilla** Ridley

Trans. Linn. Soc., ser. 2, Bot., 2 : 164 (1884).

TYPUS : *Welwitsch 1678*, Angola (holo-, BM!).

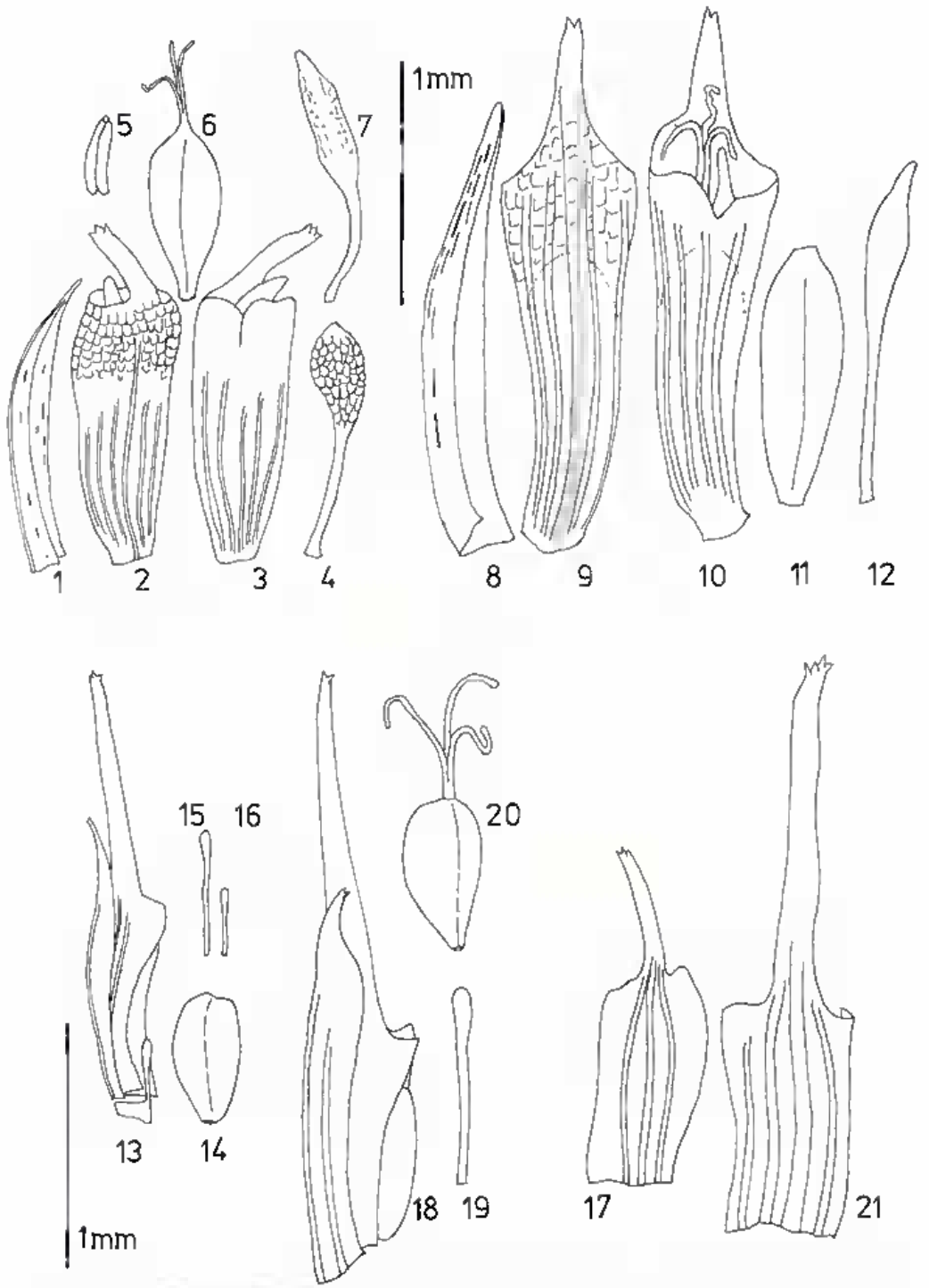
Slender, loosely clustered *annual;* stem 1-20 cm high, 0.2-0.6 mm diam. *Inflorescence* composed of 1-5 spikes, yellowish brown, marginal glumes not elongated; apical spike 3-5 mm long, ovoidal, lateral ones 2-3 mm long, more spheroidal; larger involucral bracts 2-4, up to 7 cm long; spikelets densely spirally imbricate on slender cylindrical axes. *Spikelet* bract 1-2 mm long, narrowly triangular, hyaline, the central nerve reddish brown, wings often red-dotted, tip subacute, sometimes minutely spinulose; glume 1-2.3 mm long, ± trumpet-shaped, reddish brown, enclosing floral parts and rhachilla; basal part ± tubular, widening near the upper margin, epidermis cells of the upper third part inflated, abaxially 3-5-nerved, nerves yellowish, prominent, wings adaxially connate but with a shallow incision, apical part up to 0.5 mm long, subterete, rounded or minutely spinulose at the tip; stamen 1, lateral, filament 1-1.5 mm, anther ca. 0.4 mm long; style 0.5-0.75 mm long, deeply 3-cleft; fruit 0.75-1 mm long, obovate, subtrigonous, dark red brown; rhachilla 1-1.5 mm long, club-shaped, apical part with inflated cells, ± winged sometimes with a red brown central nerve. — Pl. 12, *1-12*.

AFRICA: soudano-zambesian, from Senegal to Tanzania, S extending to Namibia. — MADAGASCAR. — ASIA : Vietnam.

18. **Ascolepis dipsacoides** (Schum.) J. Raynal

Adansonia, ser. 2, 8 : 99 (1968).
= *Kyllinga dipsacoides* SCHUM., Beskr. Guin. Pl. : 41 (1827).
— *Ascolepis setigera* HUTCH., Fl. W. Trop. Afr. 2 : 474 (1963), *nom. inval. (descr. angl.)*; syntypi : *Barter 761, p.p.*, Nigeria, K; *Lely P471*, Nigeria, K.

TYPUS : *Thonning s.n.*, Ghana (holo-, C).



Pl. 12. — **Ascolepis pusilla** Ridl. (1·6 from *Hepper 1240*, BRVU; 7 from *Hepper 3898*, WAG; 8·12 from *Welwitsch 1678*, BM) : **1**, bract laterally; **2**, glume dorsally; **3**, glume ventrally; **4**, rhachilla; **5**, anther; **6**, fruit, style and stigmas; **7**, rhachilla; **8**, bract laterally; **9**, glume dorsally; **10**, glume ventrally; **11**, fruit; **12**, rhachilla. — **Ascolepis dipsacoides** (Schum.) J. Rayn. subsp. **dipsacoides** (*Hepper 3903*, WAG); **13**, spikelet laterally; **14**, fruit; **15** & **16**, rhachilla; **17**, glume dorsally. — subsp. **siamensis** (C.B. Clarke) J. Rayn. (*Kerr 2261*, BM) : **18**, spikelet laterally; **19**, rhachilla; **20**, fruit, style and stigmas; **21**, glume dorsally.

subsp. **dipsacoides**

Slender, loosely tufted *annual;* stem 5-20 cm high, 0.4-0.6 mm diam. *Inflorescence* composed of 1-5 spikes, yellowish green, marginal glumes not elongated; apical spike 4-6 mm long, ovoidal, lateral ones 2-3 mm, more spheroidal; larger involucral bracts 2, up to 4 cm long; spikelets densely spirally imbricate on a slender cylindrical axis. *Spikelet* bract 1 mm long, narrowly obovate, hyaline, the central nerve pale brown, apical part narrowed, tip sometimes minutely spinulose, glume 1.5-1.75 mm long, basal part 2/3-3/4 of the upper part, basal part broadly elliptic, concave, hyaline, centrally 3-nerved, floral parts ± enclosed by the glume wings, apical part sharply differentiated from the broad basal part, subterete, whitish, minutely spinulose at the tip; stamens 1-2, lateral, filament ca. 0.75 mm long, anther not seen; style 0.4-0.5 mm long, deeply 3-cleft; fruit 0.5-0.6 mm long, obovate, subtrigonous, dark red brown; rhachilla 0.25-0.5 mm long, whitish, subterete, apical part sometimes slightly thickened, ± persistent. — Pl. 12, *13-17.*

AFRICA: western soudano-zambesian, from Senegal to Cameroun.

subsp. **siamensis** (C.B. Clarke) J. Raynal

Adansonia, ser. 2, 8 : 99 (1968).

≡ *Scirpus squarrosus* L. var. *siamensis* C.B. CLARKE, *in* HOSSEUS C., Beih. Bot. Centralbl. 27 (2) : 460 (1910).

≡ *Scirpus chinensis* OSB. var. *siamensis* (C.B. CLARKE) RAYM., Natur. Canad. 84 : 124 (1957).

≡ *Scirpus siamensis* (C.B. CLARKE) KERN, Blumea 9 : 219 (1958).

— *Ascolepis gracilis* TURRILL, Hook. Ic. Pl. 31 : *tab. 3020* (1915); typus : *Kerr 2261* (holo-, K!; iso-, BM!).

TYPUS : *Hosseus 101,* Thailand (holo-, K; iso-, P!).

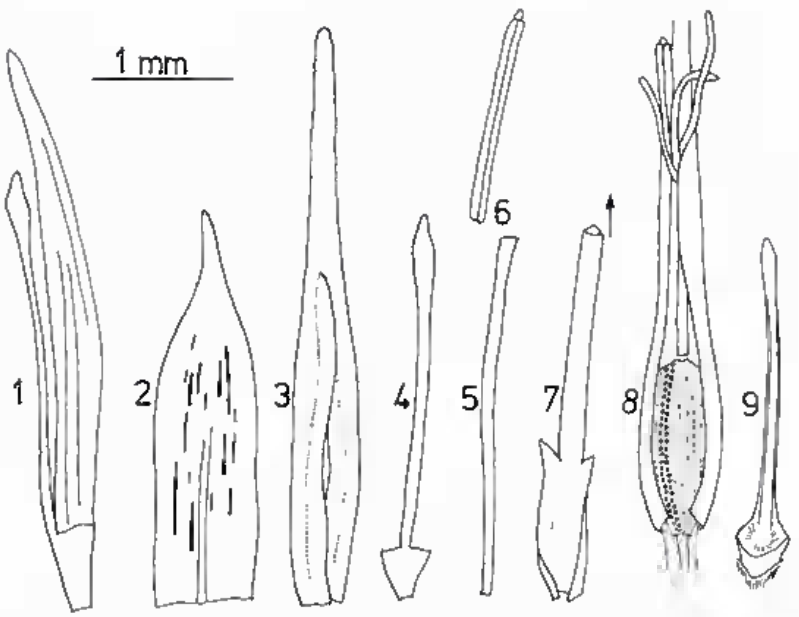
This subspecies differs from the typical one by the geographical distribution, and by the inflorescence parts which are all larger : apical spike 6-8 mm, lateral spikes 3-4 mm long, spikelet bract 1.5-1.7 mm, glume 2.4-2.7 mm long, fruit 0.6-0.7 mm, rhachilla 0.6-0.9 mm long. — Pl. 12, *18-21.*

ASIA: Thailand, Laos, Vietnam.

19. **Ascolepis majestuosa** P. Duvign. & G. Léonard

Bull. Soc. Roy. Bot. Belg. 90 : 188 (1958) ('*majestuosus*').

TYPUS : *Duvigneaud & Timperman 2316 A 1,* Zaire (holo-, BRLU!).



Pl. 13. — **Ascolepis majestuosa** P. Duvign. & G. Léonard (1-7 from *Richards 15371*, BRVU; 8-9 from *Symoens, de Wilde & Schwind 14*, BR) : **1**, outer spikelet laterally (wings of glume opened to show the rhachilla; **2**, bract dorsally; **3**, outer glume ventrally; **4**, rhachilla and pedicel; **5**, filament; **6**, anther; **7**, part of an inner glume ventrally; **8**, glume ventrally with fruit, style, stigmas and 3 filaments; **9**, rhachilla on the short spikelet pedicel.

Robust, tufted *perennial* herb; stem base bulbously thickened, covered by a dense coat of dark brown to almost blackish leaf sheaths, at last becoming fibrous; stem 20-40 cm high, 1-1.5 mm diam. *Inflorescence* condensed, (10-)20-40(-50) mm diam., hemispherical, yellowish white, brownish at the base, composed of 3-7 tightly packed spike-like structures, upper glumes of each spike extremely elongated, reaching 10-20(-25) mm; larger involucral bracts 2-3, up to 10 cm long; spikelets densely spirally imbricate on a few slender axes. *Spikelet* bract 2.5-3.5 mm, narrowly ovate-triangular, central nerve poorly developed, wings often red-dotted, tip subterete, subacute; glumes ± dimorphic, lower glumes 3.5-4.5(-6) mm long, basal part ca. 2.5 mm long, very concave, reddish hyaline, nerves whitish, floral parts enclosed by the glume wings, apical part 1-4 mm long, yellowish, subtriangular, straight, tip subacute, upper glumes 10-20 (-25) mm long, mostly empty, basal part 1-1.5 mm long, reddish hyaline, white-nerved, wings ± developed, apical part 8-19(-24) mm long, yellowish, subtriangular, tip subacute; stamens 3, lateral and anterior, filament 2.75-3 mm, anther ca. 1.5 mm long; style 2.5 mm long, deeply 3-cleft; fruit 1.25-1.5 mm long, obovate, subtrigonous, pale brownish; rhachilla 2-3 mm long, subterete but sometimes narrowly winged, slightly broadened at the tip, whitish hyaline, completely enclosed by the glume wings, ± persistent. — Pl. 13.

AFRICA: Zaire, Zambia.

SPECIES E GENERE REMOVENDÆ ET SPECIES DUBIÆ

1. *Ascolepis kyllingioides* Steud., Pl. Glum. 2 : 105 (1855).

TYPUS : *Zollinger 3287*, Java (holo-, P).

= **Lipocarpha mieroeephala** (R. Br.) Kunth.

2. *Ascolepis peteri* Kük., *in* Peter A., Repert. Sp. Nov., Beih. 40 (1), Anhang : 124 (1936).

LECTOTYPUS : *Peter 34327 a*, Tanzania, B!

≡ **Mariseulus peteri** (Kük.) P. Goetghebeur.

3. *Ascolepis tenuior* Steud., Syn. Pl. Glum. 2 : 105 (1855).

TYPUS : *Griffith s.n.*, India (n.v.).

= **Rikliella squarrosa** (L.) J. Raynal.

4. *Ascolepis venezuelensis* Schnee, Bol. Soc. Venez. Cienc. Nat. 9 : 5 (1944).

TYPUS : *Killip 37666*, Venezuela (holo-, VEN).

= **Lipocarpha** sp.

5. *Ascolepis vatkeana* Böck., Allg. Bot. Zeitschr. 2 (4) : 55 (1896).

TYPUS : *Höpfner 82*, South West Africa (iso-, Z!).

This specimen was identified as *A. speciosa* by CLARKE (1894 : 652), although the Zürich sheets, with the Clarkean handwritten label, are really too young for a certain determination. The manuscript name *A. oliveri* Vatke & Höpfner, cited also by CLARKE (1894 : 652) is based on the same collection number.

INTRAGENERIC RELATIONS

Several species groups can be distinguished, some of them well established, others of uncertain affinity; a complete system still has to be elaborated...

The major subgenus *Ascolepis* includes a whole group of species (1-8), more or less closely resembling the type *A. eriocauloides:* the section

Ascolepis, characterized by the 2-scaled (bract and first glume) spikelets, the non-connate glume wings and the single terminal spike. Another three species (9-11) probably form a related section, differing from the previous one only by the presence of an adaxial structure, a rudimentary rhachilla.

As stated in a recent paper (OTENG-YEBOAH, 1977), *A. capensis* (12) and *A. brasiliensis* (13) differ widely from species of the subgenus *Ascolepis* and therefore constitute a subgenus *Platylepis* [Kunth] Oteng-Yeboah[1]; typical features are the 2-styled ovary, the compound inflorescence, which is not present in the subgenus *Ascolepis*, the closed, dorsoventrally flattened glume, the stipitate fruit.

The remaining perennial species could not be allocated satisfactorily. *A. menonguensis* (14) seems to be related to the section *Ascolepis*, but has a closed glume, thick stems and leaves, the single known specimen has irregularly developed glumes. *A. pinguis* (15) would fit well in the other section, near *A. neglecta* (9), but its rhachilla tip with developed second glume is still a unique feature. *A. majestuosa* (19) is an outstanding species, with a really atypical inflorescence, in some respects rather resembling *Ascopholis gamblei* C.E.C. Fischer: the spikelets are spirally arranged along several axes, those axes are pulled together and surrounded by a few involucral bracts, forming a head-like structure; furthermore, it is not the glumes of the lower spikelets which are elongated, as usual, but those of the upper, and the middle part of the glume is not or but scarcely thickened.

Remaining are three problematical annual species, which have, except for the presence of an adaxial scale, very little in common, each showing highly specialized features. The glume of *A. ampullacea* (16) possesses a whitish, swollen bladder-like apical part and a concave basal part, the ribbon-like rhachilla is enclosed by the overlapping glume wings. *A. pusilla* (17) has a trumpet-like glume with a scarcely developed apical part and adaxially connate wings, enclosing the club-shaped rhachilla. Last of all, there is *A. dipsacoides* (18), with the glume middle not thickened, the glume wings abruptly narrowing into a long subterete apical part, in this respect remarkably resembling *A. majestuosa;* the more, those two species have the presence of a rhachilla in common!

RELATED GENERA

By comparing the inflorescence structure of *Ascolepis*-species with those of some related or resembling genera (Table), it is possible to divide them into three groups, each of them well characterized and easily distinguishable:

1) *Lipocarpha*-group: the spikelet bract is the most developed scale and the spike prophyll is always present.

1. Citation following RAYNAL (1972 a : 107).

2) *Mariscus*-group: the first glume of the spikelet is definitely larger than the bract, the spike and spikelet prophyll are always present.

3) *Ascolepis:* the first glume is here also the spikelet's largest scale, but the spike and spikelet prophyll are always absent.

" *Hemicarpha* " *micrantha* (Vahl) Britton and some related species are in need of a new generic name—if they deserve this rank—since the type species *H. isolepis* Nees clearly belongs to *Lipocarpha* as *L. isolepis* (Nees) R. W. Haines. The problematic *Rikliella* with its extremely reduced 1-flowered and 1-scaled spikelets, could be explained as a still further stage of reduction than *H. micrantha*, by the loss of its spikelet prophyll. RAYNAL (1973 : 155) is more inclined to an *Ascolepis* affinity, merely based upon a remarkable resemblance to—the very outstanding—*A. dipsacoides*, but the presence of a spike prophyll make this really improbable, and is

	BRACT OF SPIKELET	PROPHYLL OF SPIKELET	FIRST GLUME	OPEN (o) OR CLOSED (c)	RHACHILLA (+ 2nd glume)	PROPHYLL OF SPIKELET
Lipocarpha	++	+	+	o	—	+
« *Hemicarpha* » *micrantha*	++	+	—	o	—	+
Rikliella	++	—	—	o	—	+
Mariscus paradoxus . . .	+	+	++	o	+	+
Mariscus malawicus . . .	+	+	++	o	—	+
Alinula.	+	+	++	o	—	+
Marisculus	+	+	++	c	—	+
Ascopholis.	+	+	++	c	—	?
Ascolepis majestuosa . . .	+	—	++	o	+	—
Ascolepis pinguis	+	—	++	o	+	—
Ascolepis ampullacea. . .	+	—	++	o	+	—
Ascolepis pusilla.	+	—	++	c	+	—
Ascolepis eriocauloides . .	+	—	++	o	—	—
Ascolepis menonguensis. .	+	—	++	c	—	—
Ascolepis capensis	+	—	++	c	—	—

more in favour of a close relationship of *Rikliella* to the likewise resembling *H. micrantha*.

Here I would like to put forward the question whether these three taxa merit distinction at the generic level, or perhaps should be considered as subdivisions of *Lipocarpha* s.l., because transitional situations are known: *Lipocarpha sellowiana* Kunth (PALLA, 1905 : 319) with an underdeveloped glume, the spikelet prophyll in *H. micrantha* var. *minor* (Schrad.) Friedland (1941 : 859, fig. 7) can show several stages of reduction, and I have seen fruiting specimens of *H. micrantha* which lack this prophyll, but in this case they could have withered. So, clearly the " genera " are approaching each other closely, the single character of developmental stage of minute hyaline scales doesn't seem to meet the requirements of generic distinction.

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