

The Genus *Andropogon* in Southern Africa

by

J. G. Anderson

ABSTRACT

This study is limited to an investigation of the Southern African representatives of the genus *Andropogon*, consisting of 14 species, two varieties and one record of doubtful identity. The history, karyology, leaf anatomy and anatomy of the shoot and embryo are discussed briefly. A key based on floral and vegetative characters is provided and a detailed description of the genus and of each species and variety is given. The nomenclature and synonymy for each taxon is included as well as brief notes on the distribution and habitat. Specimens deposited in the National Herbarium, Pretoria, and several other South African Institutions are cited in full.

INTRODUCTION

No thorough revision of the genus *Andropogon*, as it occurs in South Africa and including its nomenclature, has been undertaken since Stapf's excellent work in Volume 7 of the *Flora Capensis* (1898). An unpublished thesis by W. J. Louw (1943) is available in which special attention is given to the leaf anatomy, but he dealt with only nine species. A summary of the then known South African species, with short descriptions and keys, was published by Chippindall in "The Grasses and Pastures of South Africa" (1955), but this work did not include nomenclatural information nor the citation of specimens. Since the publication of this work, three new species have been described by the present author, and one additional species has been recorded for South Africa. The genus *Hypogynium* which included the South African species *H. festuciformis* has been referred back to *Andropogon* by Clayton in the *Kew Bull.* 17, 3: 469 (1964). The present revision was, therefore, undertaken in order to include the new information, as well as to investigate questions of synonymy and nomenclature.

Most of the information regarding the anatomy of this genus was obtained from Louw's unpublished data but, as he did not deal with *A. absyssinicus*, *A. lacunosus*, *A. ravus*, *A. laxatus* and *A. festuciformis*, these species were investigated by the present author.

The material in the National Herbarium, Pretoria, was studied as well as specimens kindly sent on loan from the following herbaria: Bolus, Durban, Grahamstown, Kimberley, Natal University and the South African Museum. Type material was gratefully received on loan from Kew, Lisbon, Paris, Stockholm, Vienna and Zurich. Special thanks are due to Dr. B. de Winter of the Botanical Research Institute, Pretoria, for assistance and guidance.

All specimens cited are represented in the National Herbarium, Pretoria (PRE), unless indicated otherwise.

HISTORY

Twelve species of *Andropogon* were included by Linnaeus in the first edition of his *Species Plantarum* (1753) and, of these, *A. distachyos* L. has generally been accepted as the type species. Most of the remaining eleven species, owing to their divergent characteristics, have been assigned to other genera by subsequent authors. After Linnaeus, the most important contributions to the knowledge of the genus for Southern Africa came from Nees, Steudel, Hackel and Stapf.

In 1841 Nees dealt with 16 species of *Andropogon* and separated them into two subgenera viz. *Gymnandropogon* and *Cymbopogon*. The subgenus *Gymnandropogon* contained six species of which three, *A. eucomus*, *A. amplexens* and *A. appendiculatus* were newly described from South Africa and are still regarded as true members of *Andropogon*. The three remaining species are now placed in the genus *Bothriochloa*. Under the subgenus *Cymbopogon*, Nees included ten species, eight of which were newly described. These species have since been placed in the genera *Monocymbium*, *Hyparrhenia* and *Cymbopogon*. Nees also described *Heteropogon filifolius* in this work, a species subsequently transferred to *Andropogon* by Steudel.

Steudel, in 1855, recognised 459 species and divided the genus into five sections and 29 subsections. Twenty species were cited from South Africa. Whilst several of these were transferred to other genera by later workers, most of them were retained as distinct taxa.

Hackel revised the tribe Andropogoneae in A. & C. de Candolle's "Monographiae Phanerogamarum" in 1889 and divided the genus *Andropogon* into two series viz. Isozygi and Heterozygi, consisting of thirteen subgenera with 193 species. Nine of these were mentioned as coming from South Africa. Two new South African species were described in this work, viz. *A. schinzii* and *A. pilosissimus*. During the present study the holotype of *A. pilosissimus* was seen and it compared well with specimens of *Hyparrhenia aucta* (Stapf) Stent deposited in the National Herbarium, Pretoria. The necessary combination is made on p. 130 of this issue.

In 1898 the genus as it occurs in South Africa was fully treated by Stapf in the *Flora Capensis*, Volume 7. Stapf followed Hackel in separating the genus into the two series Isozygi and Heterozygi, dividing the South African representatives into nine subgenera and 32 species. Stapf also states that this genus "consists of several heterogeneous elements" and that "several of the old genera of which it is made up, will have to be restored, as for instance *Chrysopogon*, *Cymbopogon* and *Heteropogon*". Only the seven species placed into the subgenus *Arthrolophis* are at present regarded as true members of *Andropogon*.

In the *Flora of Tropical Africa*, 1919, Stapf treated the species of the genus occurring in tropical Africa. In this work Stapf reinstated a number of genera formerly placed in synonymy under *Andropogon* and gave a narrower circumscription to the latter. The Andropogoneae were separated into sixteen subtribes with the genus *Andropogon* placed in the subtribe Andropogonastreae. Stapf recognised 46 species (and four sections). Of these, four species and one variety were known from South Africa. Another four species and one variety subsequently proved also to occur in South Africa.

The most recent work on the genus in this country is by Chippindall in "The Grasses and Pastures of South Africa", (1955), in which ten species and one variety are included. In this work brief descriptions of the species are supplied but synonymy and citation of specimens are omitted.

ECONOMIC IMPORTANCE

Economically this genus is not regarded as important and the species are usually classified as "sour grasses". They are usually grazed only in the young stages becoming unpalatable when mature. Ecologically, however, certain species are important constituents in several of the major veld types of South Africa.

KARYOLOGY

In their study of *A. distachyos*, the type species of the genus, Gould (1956) and Celarier (1956) found that in this species $2n = 36$, indicating a basic chromosome

number of 9. For *A. abyssinicus*, Gould reported a count of 16. Subsequent studies by various authors dealing with several other species of *Andropogon*, however, have shown that 10 appears to be the commonest basic number in the genus.

The following table is a summary of the chromosome numbers so far recorded for the South African species, with the authority and year of publication.

Species	2n	Authority and Year of Publication
<i>A. abyssinicus</i>	32	Gould (1956)
<i>A. amplexans</i>	40	Moffett and Hurcombe (1949)
<i>A. appendiculatus</i>	20	De Wet (1956)
<i>A. distachyos</i>	36	Gould (1956)
<i>A. eucomis</i>	20	Moffett and Hurcombe (1949)
		De Wet (1954)
<i>A. filifolius</i>	60	De Wet (1958)
<i>A. gayanus</i> var. <i>squamulatus</i>	40	Moffett and Hurcombe (1949)
<i>A. huillensis</i>	60	De Wet (1960)
<i>A. schinzii</i>	40	Moffett and Hurcombe (1949)
	20	De Wet (1956)
<i>A. schirensis</i> var. <i>angustifolius</i>	20	De Wet (1954)

ANDROPOGON

Andropogon L., Sp. Pl. 1045 (1753); Gen. Pl. ed. 5: 468 (1754); Nees, Fl. Afr. Austr. 103 (1841), emend.; Steud., Syn. Pl. Glum. 1: 363 (1855); Benth. & Hook. f., Gen. Pl. 3, 2: 1133 (1883); Hack. in DC., Monogr. Phan. 6: 359 (1889); Stapf in Fl. Cap. 7: 334 (1898); Fl. Trop. Afr. 9: 208 (1919); Phill., Gen. ed. 2: 84 (1951); Chippindall in Gr. & Pastures S. Afr. 1: 495 (1955). Type species: *A. distachyos* L. (as "*distachyon*", 1753).

Spikelets 2-nate, the one sessile, the other pedicelled, those of each pair differing in sex and also more or less in shape and size or those of the lowest pair of the lowest raceme male or imperfect or the pedicelled suppressed and the spikelets thus solitary. *Sessile spikelets* 2-flowered, dorsally or laterally compressed, rarely pubescent, nearly always with a bent and twisted awn; callus obtuse, subacute or acute, rarely broad and obtusely rounded, shortly bearded. *Glumes* equal to subequal, subcoriaceous or membranous; lower flat, concave or channelled on the back with sharply inflexed margins at least from the middle upwards, rarely with subcircular or elongated shallow pits, 2-keeled; upper more or less boat-shaped, keeled upwards, 1-3-nerved, sometimes aristulate or awned. *Lemmas* ciliate or ciliolate, rarely glabrous, lemma of lower floret hyaline, 2-nerved; lemma of upper floret 2-fid or 2-dentate, usually awned from the sinus, hyaline or firmer and sometimes substipiform below the insertion of the awn; awn usually 2-8 times the length of the lemma. *Paleas* hyaline nerveless scales or absent. *Lodicules* 2, minute, glabrous. *Stamens* 3, rarely reduced to staminodes. *Ovary* glabrous, styles terminal; stigmas laterally exserted. *Grains* narrowly lanceolate to oblong in outline, subterete to plano-convex; embryo about half the length of the grain; starch grains simple or compound, granules mostly numerous. *Pedicelled spikelets* often larger and more conspicuous than the sessile, sometimes small and suppressed and represented by the pedicel only, more or less dorsally compressed, rarely hairy. *Glumes* herbaceous, chartaceous or membranous; lower usually flat on the back, rarely grooved or with subcircular or elongated pits, muticous or very rarely aristulate, usually many-nerved; upper membranous to subcoriaceous, 3-5, rarely 7-nerved, ciliate or ciliolate on the margins, apex acute, acuminate, mucronate or shortly awned. *Florets*: lower reduced to the lemma; upper male or sterile, rarely bisexual; lemma, if present, hyaline, muticous or very rarely aristulate.

Perennials of various habit, rarely annuals, usually compactly caespitose, sometimes with an oblique or short rhizome, very rarely fascicled or stoloniferous. *Culms* erect, rarely geniculate, terete or sometimes compressed below, glabrous, smooth, rarely hairy upwards, often channelled on the one side, usually simple, rarely branched either from the base or from all the nodes resulting in a suffrutescent habit, or only from the upper nodes. *Leaves* with the sheaths terete or the lower compressed and keeled, glabrous or sparingly hairy, rarely densely pubescent, smooth, often tinged with purple; ligules membranous with a ciliate or ciliolate rim, often scarious, truncate, rounded to oblong or oblong-lanceolate; blades linear, expanded or longitudinally folded (or revolute in dried specimens), more rarely filiform. *Inflorescence* of 1-many spike-like racemes which are either in pairs, with the lower almost sessile, upper shortly peduncled, or arranged subdigitately, or on a short central axis at the end of the culm and, if present, its flowering branches; raceme pairs or corymbs supported by a spathe or spatheole and frequently collected into a false panicle; racemes glabrous or often plumose with white or cream-coloured hairs; joints and pedicels linear, filiform, cuneate or cuneate-clavate, often inflated and hollow or thickened upwards, tips more or less cupular, auricled or dentate, rarely truncate.

ANATOMY

Shoots rounded, compressed or strongly compressed in cross section, rarely cylindrical; leaf-blades rolled or folded in the bud; sheaths slightly to prominently keeled. *Leaf-blades* flat, V-shaped or rarely terete in cross section, keels acute and prominent or obtuse, rarely rounded, formed by an adaxial tissue of colourless parenchyma cells, which are roughly triangular in transverse section. *Silicified cells* dumb-bell-shaped; lateral walls smooth, exceptionally with a small central bulge. *Suberized cells* more or less rectangular often with undulating lateral walls. *Ripple-walled cells* more or less rectangular and arranged with their long axis parallel to the vascular bundles. *Stomata* mainly located on the abaxial surface, usually in 1–2 longitudinal rows between the nerves. *Motor cells* large and rectangular or hexagonal in shape, occupying $\frac{1}{4}$ – $\frac{1}{2}$ the thickness of the leaf. *Hairs* variable and rare, of three kinds: (1) unicellular usually antrorse sharp-pointed bulbous-based hairs; (2) unicellular tubercle-based hairs, mostly on the abaxial surface and confined to motor cell and ripple-walled cell areas; (3) bicellular hairs of which the basal and upper cells are approximately equal in length; upper cell delicate and with a subobtuse apex. *Bundle sheaths*: outer sheath thick-walled, parenchymatous, usually containing chloroplasts; inner sheath absent. *Chlorenchyma* consisting of a usually well defined single layer arranged in the form of an arc and surrounding each vascular bundle, often supported by irregularly shaped chlorophyll-bearing cells, mainly adaxially; the two adjacent arcs are either adjoining or separated by a single row of larger rounded cells. *Bulliform cells* mainly consisting of enlarged epidermal cells. *Embryo* about half the length of the grain; epiblast absent; deeply cleft between the lower part of the scutellum and the coleorrhiza; the vascular tissue with a distinct elongation between the point of divergence of the scutellum bundle and the base of the coleoptile; margins of the primary leaf of the embryo (sheathed by the coleoptile) overlapping and with several vascular bundles; the coleoptile sheath with two lateral bundles and the scutellum with one median bundle.

DISTRIBUTION

A large genus occurring mainly in the tropical and subtropical regions of both hemispheres. Fourteen species, two varieties and one record of doubtful identity (from the Natal Drakensberg) have been recorded from South Africa.

Most of the species are widely distributed throughout the eastern grassveld regions of South Africa. Two species, *A. eucomus* and *A. appendiculatus* extend, in addition, into mainly the coastal districts of the eastern and southern Cape, penetrating into

the south-western regions of the Cape. Three species and one variety, viz. *A. eucomus*, *A. amplexens*, *A. schinzii* and *A. schirensis* var. *angustifolius* also occur in the central regions while *A. schinzii*, *A. eucomus*, *A. brazzae*, *A. huillensis*, *A. schirensis* var. *angustifolius* and *A. gayanus* var. *squamulatus* have been recorded from northern South West Africa; all occur north of the tropic of Capricorn.

The name "Andropogon" is derived from the Greek words, *aner*, a man, and *pogon*, a beard.

- 1 Basal parts usually distinctly flattened; lower and sometimes the upper leaf-sheaths compressed and keeled, usually strongly so; leaf-blades folded or sharply keeled, rarely expanded; racemes 1-15:
- 2 Racemes plumose with silvery-white or cream-coloured hairs; joints and pedicels filiform and slightly curved with hairs more than 5 mm long:
- 3 Sessile spikelets 2-3 mm long, the pedicelled suppressed or represented by a minute rudiment; hairs on the joints and pedicels several times longer than the spikelets. . . . 1. *A. eucomus*
- 3a Sessile spikelets 4-6 mm long, the pedicelled usually suppressed or rudimentary, more rarely well developed; hairs on the joints and pedicels about as long as the sessile spikelets:
- 4 Racemes 5-12 (rarely 3 or 4), loose and usually flexuous; plant stout, 90-180 cm tall; leaf-blades up to 30 cm long; lemma of the upper floret of the sessile spikelets 3-4 mm long, usually obscurely 3-nerved, rarely 1-nerved; awn 8-14 mm long
2. *A. huillensis*
- 4a Racemes 2-3, straight or slightly curved; plant up to 70 cm tall; leaf-blades up to 15 cm long; lemma of the upper floret of the sessile spikelets 2-3 mm long, usually 1-nerved; awn 15-20 mm long. 3. *A. laxatus*
- 2a Racemes not plumose; joints and pedicels linear and straight, glabrous, or with hairs up to 5 mm long:
- 5 Racemes 1-3, 2-4 cm long; plant 20-100 cm tall; leaf-blades up to 30 cm long:
- 6 Racemes 1; sessile spikelets awnless. 4. *A. festuciformis*
- 6a Racemes 2-3; sessile spikelets awned with awns up to 12 mm long. 5. *A. platybasis*
- 5a Racemes 3-20 (if only 2, then racemes hairy), 4-16 cm long; plant 40-250 cm tall; leaf-blades up to 50 cm long:
- 7 Sessile spikelets awnless; joints and pedicels glabrous or almost so; leaves expanded or often revolute, margins scabrid or spinously ciliate. 6. *A. brazzae*
- 7a Sessile spikelets awned, awns 10-15 mm long; joints and pedicels hairy with hairs up to 5 mm long; leaves usually folded, rarely expanded, margins scabrid 7. *A. appendiculatus*
- 1a Basal parts not distinctly flattened; lower leaf-sheaths rounded; leaf-blades filiform, convolute or expanded; racemes 2, exceptionally 3, 4 or 5:
- 8 Glumes densely or sparingly hairy over the whole surface with hairs up to 4 mm long or, if glabrous, then with 5-12 subcircular to elongated shallow pits (depressions) on either side of a deep longitudinal median groove; joints and pedicels linear, straight:
- 9 Lower glume of the sessile spikelet dorsally flat or only slightly concave; glumes densely or sparingly hairy with hairs about 4 mm long:
- 10 Annual; glumes densely hairy; racemes whitish-villous; joints and pedicels densely hairy on the back and sides. 8. *A. abyssinicus*
- 10a Perennial; glumes sparingly hairy; racemes appearing glabrous; joints and pedicels hairy only on the sides. 9. *A. pilosellus*
- 9a Lower glume of the sessile spikelet dorsally with a deep longitudinal median groove; glumes glabrous and with 5-12 subcircular to elongated shallow pits on either side of the groove. 10. *A. lacunosus*
- 8a Glumes glabrous or ciliate only on the keels and margins, without depressions on either side of the longitudinal median groove; joints and pedicels cuneate, cuneate-clavate or cuneate-linear, usually inflated and hollow:
- 11 Lower glume of the sessile spikelet dorsally with a deep, narrow or wide, longitudinal groove, groove often so deep that the wingless keels almost meet, especially in spikelets borne on the upper part of the raceme:

- 12 Leaf-blades broad and rounded to cordate and more or less amplexicaul at the base; callus acute or subacute..... 11. *A. amplexans*
- 12a Leaf-blades not or only slightly widened, often narrowed towards the base; callus subacute, obtuse or obtusely rounded (if acute, then leaves filiform or narrowed towards the base):
- 13 Upper glume of the sessile spikelet and both glumes of the pedicelled spikelet awned, awn up to 10 mm long; culms branched, the branches either barren or bearing inflorescences..... 12. *A. schinzii*
- 13a Glumes of both the sessile and pedicelled spikelets awnless, usually acute or mucronate; culms simple, rarely with one flowering branch:
- 14 Sessile spikelets 7-9 mm long; callus broad and obtusely rounded; plants often with a branched system of knotty rhizomes; inflorescence usually glaucous-grey or green..... 13. *A. ravus*
- 14a Sessile spikelets up to 7 mm long; callus obtuse, subacute or acute; plants densely tufted; inflorescence and often the older leaves drying brown or reddish-brown:
- 15 Sessile and pedicelled spikelets very unequal in length; awn of sessile spikelets 3-5 cm long, stout; callus acute or subacute; leaves usually filiform or when expanded then up to 3 mm wide, leaf-sheath usually breaking up into fibres when old..... 14. *A. filifolius*
- 15a Sessile and pedicelled spikelets more or less equal in length; awn of sessile spikelets up to 3 cm long, slender; callus obtuse to subacute; leaf-blades usually expanded and 3-7 mm wide; lower leaf-sheaths not breaking up into fibres..... 15. *A. schirensis* var. *angustifolius*
- 11a Lower glume of the sessile spikelet dorsally flattened or only very shallowly grooved:
- 16 Keels of the glumes of the sessile spikelets wingless; culms branched, robust, up to 3.5 m tall, usually glaucous, plants tufted..... 16. *A. gayanus* var. *squamulatus*
- 16a Keels of the glumes of the sessile spikelets distinctly winged; culms simple, up to 1.2 m tall; plant with a short oblique rhizome..... 17. *A. distachyos*

1. *Andropogon eucomus* Nees, Fl. Afr. Austr. 1: 104 (1841); Steud., Syn. Pl. Glum. 1: 390 (1855); Hack. in DC., Monogr. Phan. 6: 421 (1889); Stapf in Fl. Cap. 7: 338 (1898); Fl. Trop. Afr. 9: 230 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 501 (1955). Type: Clanwilliam, Olifantsriver, *Ecklon & Zeyher* s.n. (S, lecto.!).

Eriopodium kraussii Hochst. ex Krauss in Flora 115 (1846). Type: Natal, between Umlazi River and Durban Bay, *Krauss* 163 (K!; PRE, fragment!).

Perennial, densely tufted, occasionally with a short creeping rhizome. *Culms* up to 90 cm long, erect or slightly geniculate, glabrous, 4-6 noded, compressed below, simple to about the middle and with 2-6 or more flowering branches from the upper nodes. *Leaves* up to 30 cm long and 4 mm broad, folded or rarely expanded, linear, acute, glabrous or pubescent especially near the ligule, smooth or slightly scaberulous on the margin, midrib slender, prominent below, lateral nerves 4-5 on each side, very fine; ligules 0.5 mm long, truncate, membranous, ciliolate; sheaths glabrous or bearded near the mouth, rarely lower down, firm, basal compressed and keeled, the remainder shorter than the internodes, terete, distant, the uppermost subtumid. *Inflorescence* of 2-5 subdigitate racemes, conspicuously plumose from the silvery-white hairs surrounding the spikelets and on the rachis and pedicels; spathes linear-lanceolate, acuminate or acute, usually without a blade, glabrous, pale-green or tinged with purple or red, at length tightly inrolled. *Racemes* 3-5 cm long, plumose, often nodding; joints finely filiform, 2 mm long, silky with soft 1.0-1.2 cm long hairs; pedicels similar, 4 mm long, quite barren or occasionally with the minute rudiment of a spikelet at the apex. *Spikelets* all sessile, hermaphrodite, often purplish; callus minute, truncate, long bearded. *Glumes* equal; lower 2-3 mm long, subcoriaceous, narrowly lanceolate, concave dorsally, keeled, with 2-3 obscure nerves in each keel; keels scabrid in the upper half, rarely long bearded near the apex, obtuse and glabrous in the lower half; apex minutely bifid; upper boat-shaped, 2-3 mm long, membranous,

1-nerved, sparingly pilose on the margins in the upper half, dorsally scabrid on the nerve; apex acuminate or shortly mucronate. *Lower floret* reduced to a lemma 2–2.5 mm long, narrowly lanceolate, membranous, hyaline, nerveless, sparingly ciliate. *Upper floret* hermaphrodite, lemma 1.5–2 mm long, lanceolate-oblong, 1-nerved, ciliolate, bifid to about one third, lobes finely subulate, awned from between the lobes; awn a fine bristle, 12–20 mm long, slender, slightly twisted near the base; palea very minute, hyaline, nerveless; anthers 0.75 mm long; grain 1 mm long or longer, linear-lanceolate in outline, subcylindric. *Pedicelled spikelets* absent or reduced to a minute rudiment.

This species is widely distributed in southern Africa but has not been recorded from the drier areas of the central Cape, south-western Orange Free State and southern South West Africa. It also occurs in Mozambique, Rhodesia, Angola, the Congo and Uganda. It usually grows in damp places, often in vleis and occasionally in open grassland or on rocky outcrops.

CAPE.—Ceres: *Marloth* 12643. Clanwilliam: Olifants River at Villa Brakfontein, *Zeyher* 47. East London: Convict Station, *Galpin* 5580. Grahamstown: *Hutton* 249. Hay: Griquatown, *Burchell* 2102 (GRA; PRE, fragment); Witsand, *Acocks* 4474 (KMG); *Leistner* 1171. Humansdorp: Kareedouw, *Fourcade* 2533. Komga: near Kei Mouth, *Flanagan* 2362. Paarl: Klein Drakenstein Mts. on Berg River, *Drege* s.n. (S; PRE, fragment); Dal Josaphat, *Tyson* 6050 (SAM). Peninsula: Kloofneck, *Marloth* 3717; Steenberg near Lakeside, *Bolus* 14928 (BOL). Port Elizabeth: Schoemakers Kop, *Paterson* 548 (GRA). Riversdale: Kortfontein, N. slopes of Langeberge, *Acocks* & *Hafstrom* 2039. Robertson: Omklaar, *Stokoe* 7196 (BOL). Somerset West: Steenbras River Mouth, *Acocks* 3936 (KMG). Taung: Thoming, *Brueckner* 1235; *Rodin* 3653. Tulbagh: Nieuwkloof, *MacOwan* 1691 (GRA, SAM). Vryburg: Armoedsvlakte, *Mogg* 8123. Worcester: Bainskloof Pass, *Bolus* 11743 (BOL).

BASUTOLAND.—Tejatejaneng: *Dieterlen* 816.

ORANGE FREE STATE.—Heilbron: Makouvillei, *Brandmuller* 44; Viljoensdrift, *Rogers* 13101.

NATAL.—Bergville: Cathedral Peak Forest Research Station, *Killick* 1435; 1448. Camperdown: Nagle Dam, *Wells* 1171 (NU). Dundee: Vants Drift, *Codd* 185. Durban: Bay End, *Strey* 4543; *Medley Wood* 1654 (NH); 6004; *Rehmann* 8550 (GRA). Eshowe: *Kotze* 417. Estcourt: Mountain hostel, *West* 253; Champagne Castle, *Bayer* 1246a. Newcastle: 20 miles S.E., *Godfrey* S.H. 1887. New Hanover: Blinkwater, *Sim* 19361. Nkandla: Melmoth, *Tinley* 6; Qudeni, *Leisegang* 57 (NU). Nongoma: *Gerstner* 3875 (NH). Pietermaritzburg: Table Mtn., *Killick* 282 (NU). Signal Hill, *Bews* 37 (NU). Port Shepstone: *Mogg* 13201. Umlazi: Umlaas River, *Drege* s.n. (S, SAM); Isipingo Beach, *Ward* 1275 (NU). Utrecht: Donkerhoek, *Devenish* 1124.

SWAZILAND.—Mbabane: Ukutula, *Compton* 25514; Forbes Reef, *Compton* 22391.

TRANSVAAL.—Belfast: Schoemanskloof, *Smuts* 336. Brits: Jacksonstun, *Van Vuuren* 400. Ermelo: Athole Pasture Research Station, *Norval* 137. Johannesburg: *Hutton* 249 (GRA). Krugersdorp: Jack Scott Private Nature Reserve, *Wells* 2367. Letaba: Duiwelskloof, Westfalia Estate, *Scheepers* 838. Lichtenburg: Malmanie Oog, *Burt Davy* 80. Middelburg: Pan Station, *Burt Davy* 137. Nelspruit: Kaapsehoop, Devils Kantoer, *Pole Evans* 1008. Pietersburg: farm Vaalwater, *Skead* 31; Houtbosch, *Rehmann* 5673 (BOL). Pilgrims Rest: Mariepskop, *Van der Schijff* 4473. Potchefstroom: Welverdiend, *Louw* 870. Potgietersrus: Crecy, *Barenbrug* M. Pretoria: Rayton vlei, *Schweickerdt* 1583; Waterkloof, *Verdoorn* 832; Wonderboom, *Louw* 864. Vereeniging: *Brandmuller* 44. Waterberg: Nooitgedacht 699, *Acocks* & *Naude* 42.

BECHUANALAND.—Lobatsi: Kanye, Bathosu Dam, *Miller* B/873.

SOUTH WEST AFRICA.—Caprivi: Katima Mulilo, *Killick* & *Leistner* 3082. Grootfontein: Omuramba, Hohensee, *Boss* s.n.; Fontein Omuramba, *De Winter* & *Marais* 5041. Okahandja: *Wiss* & *Kinges* 994. Otjiwarongo: Waterberg, *Liebenberg* 4785; Waterberg plateau, *Boss* s.n.

The *Ecklon* & *Zeyher* specimen in Stockholm proved to be the most authentic material seen. This specimen is written up in Nees's own handwriting and was for this reason chosen as the lectotype.

This species is characterized by the absence of pedicelled spikelets. The pedicels, although present, are either barren or bear only the minute rudiments of a spikelet. The hairs on the joints and pedicels are dense and several times longer than the spikelets. These hairs, together with the long slender awns of the lemma of the upper floret, give the inflorescence an attractive white, plumose appearance.

2. *A. huillensis* Rendle, Cat. Afr. Pl. Welw. 2: 146 (1899); Stapf in Fl. Trop. Afr. 9: 231 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 500 (1955). Type: Angola, Huila, Humpata, *Welwitsch* 2670 (BM, holo.; PRE, fragment!, photo!).

Perennial, tufted from a short oblique rhizome. Culms 90–180 cm long, erect, stout, terete, 5 or more noded, glabrous, very smooth, shiny, simple up to the third or fourth node. Leaves up to 60 cm long and 4 mm wide, linear, long tapering to a fine apex, flat or folded, firm and hard, the upper almost reduced to the midrib, smooth and glabrous or sparingly pilose towards the ligule, scaberulous on the margin; ligules 2 mm long, firm, scarious, ciliolate; sheaths firm, tight, glabrous or bearded near the ligule, the lower up to 25 cm long, compressed and keeled or sometimes terete, often shiny or tinged with purple. Inflorescence of 5–12 racemes arranged subdigitately, plumose from the long white hairs on the joints and pedicels; spathes glabrous, the lowest resembling the preceding leaves; spatheoles narrow, linear-lanceolate to linear, tapering to an acute apex, up to 8 cm long, reddish, at length tightly inrolled. Racemes 4–10 cm long, slender, loose, flexuous and often nodding, plumose, sessile or with peduncles 1–3 cm long; peduncles glabrous; joints 3–6 mm long, filiform, often curved, bearded with fine, approximately 7 mm long hairs, apex shallowly cupular; pedicels similar but approximately 5 mm long. Sessile spikelets 4–6 mm long, linear-lanceolate, more or less tinged with purple; callus minute, rounded, bearded. Glumes firmly membranous; lower 4–6 mm long, dorsally deeply or shallowly concave, keeled, obscurely 3-nerved in each keel; keels scaberulous in the upper half, apex minutely bifid; upper 5 mm long, narrowly boat-shaped, 1-nerved, pilose on the margins in the upper half; apex acuminate or mucronulate. Lower floret reduced to a linear-oblong lemma, 3–5 mm long, membranous, hyaline, nerveless or obscurely 2-nerved, pilose on the margins in the upper half, apex acute. Upper floret hermaphrodite; lemma 3–4 mm long, narrowly linear-lanceolate, membranous, hyaline, obscurely 3-nerved, rarely 1-nerved, pilose on the margins in the upper half, 2-lobed, lobes acute, awned from between the lobes, awn a fine bristle 8–14 mm long, usually bent and twisted below the middle, scaberulous; palea 2–2.5 mm long, oblong, hyaline, nerveless, bearded near the obtuse apex; anthers 2 mm long; grain 4 mm long, linear-lanceolate. Pedicelled spikelets variously reduced, sometimes to a glume or entirely suppressed, occasionally well developed and male and then as long as or slightly longer than the sessile.

A. huillensis is common in the Transvaal and is also found in Zululand, Swaziland, South West Africa, Angola, Rhodesia and Mozambique. It usually grows in damp places, along streambanks and in vleis, very often in sandy soils.

TRANSVAAL.—Barberton: White River, *Rogers* 22965. Brits: Jacksonstuin, *Van Vuuren* 392. Johannesburg: *Hutton* 254. Krugersdorp: Lake, *Louw* 922. Lydenburg: between Lydenburg and Dullstroom, *Pole Evans* 3811. Middelburg: *Burt Davy* 13264; *Hutchinson* 2709. Nelspruit: Pretoriuskop, *Van der Schijff* 2648. Pilgrims Rest: Graskop, Driekop Gorge, *De Winter & Codd* 210. Potchefstroom: Elandsfontein, *Louw* 1522. Potgietersrus: Pyramid Estate, *Galpin* 8884. Pretoria: Rayton vlei, *Schweickerdt* 1593; Premier Mine, *Repton* 4058. Rustenburg: Rainhill, *Story* 991; *Codd* 1074. Soutpansberg: Phiphiti Waterfalls, *Overmeyer* s.n. Warmbad: *Bell* s.n. Waterberg: Twenty-four Rivers, 13 miles E. of Vaalwater, *Codd* 994; *Rogers* 25104.

NATAL.—Ubombo: Bazwanu, *Strey* 5135.

SWAZILAND.—Hlatikulu: Mhlambanyati Pan, *Michelmores* 50. Mbabane: Black Mbuluzi Valley, *Compton* 31269.

SOUTH WEST AFRICA.—Caprivi: Andara, Okavango River, *Volk* 2154.

A. huillensis can be confused with *A. eucomus* and *A. laxatus* but is generally a taller, more robust plant with larger spikelets and with the hairs on the joints, and pedicels shorter than in *A. eucomus*. In *A. laxatus* there are only 2–3 racemes in the inflorescence whereas there are 5–12 in *A. huillensis*. In *A. huillensis* the pedicelled spikelets are usually suppressed, these being represented by much reduced glumes. These spikelets are occasionally well developed and male.

Welwitsch 2644, collected in Angola, was described by Rendle as *A. huillensis* var. *minor* in Cat. Afr. Pl. Welw. 2: 147 (1899). In the Flora of Tropical Africa, Stapf states that the plant has smaller inflorescences and smaller spikelets and adds that it is probably only a weaker state of *A. huillensis*. I have seen an isotype as well as a fragment and photograph of the holotype and in my opinion this variety should be included in the synonymy of *A. laxatus*.

3. *A. laxatus* Stapf in Fl. Trop. Afr. 9: 237 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 501 (1955). Syntypes: Angola, *Welwitsch* 2693; Rhodesia, Inyanga, *Mundy* s.n.; Salisbury, *Mundy* s.n. (K!).

A. ternatus Nees var. *africanus* Rendle, Cat. Afr. Pl. Welw. 2: 147 (1899). Type: Angola, Huila, dry wooded pastures near Humpata, *Welwitsch* 2643 (LISU!; PRE, photo!). *A. huillensis* Rendle var. *minor* Rendle in Cat. Afr. Pl. Welw. 2: 147 (1899). Type: Angola, Huila, rather damp rich pastures on the river Monino, *Welwitsch* 2644 (LISU!; PRE, photo!, fragment!).

Perennial, densely tufted. Culms up to 70 cm long; erect, terete, somewhat compressed below, glabrous, smooth, shiny, sometimes pruinose below the lower nodes, branched in the upper half, 1–3 noded. Leaves up to 15 cm long and 4 mm wide, linear, expanded or folded, subacute, firm, flexuous or straight, glabrous or sparingly hairy near the ligule, margins scaberulous; ligules 1 mm long, scarious, rounded or truncate, ciliate; sheaths firm, glabrous, smooth, the lowest up to 6 cm long, compressed, keeled, the upper looser, much longer and more or less terete. Inflorescence of 2, rarely 3, racemes on a short common axis, silkily plumose from the hairs on the joints and pedicels; spathes resembling the preceding leaves and with short blades; spatheoles very narrow, acute, 6–8 cm long, at length tightly inrolled, tinged with purple. Racemes 4–6 cm long, slightly flexuous, plumose; peduncles short or the upper raceme sessile; joints 4–6 mm long, filiform, flattened, bearded with spreading hairs 5–8 mm long, apex cupular; pedicels similar, 4–5 mm long, apex obtuse. Sessile spikelets 5–6 mm long, linear-lanceolate; callus small, obtuse, bearded. Glumes more or less equal, membranous; lower 5–6 mm long, dorsally concave, keeled, 1–2-nerved in each keel; keels scaberulous in the upper half, apex shortly bifid; upper 5–6 mm long, narrowly boat-shaped, 1–3-nerved, pilose on the margins in the upper half, dorsally scabrid on the nerves, apex mucronate, mucro approximately 1 mm long. Lower floret reduced to a lemma 4–5 mm long, narrowly oblong, hyaline, nerveless, pilose on the margins in the upper half, apex acute. Upper floret hermaphrodite; lemma 2–3 mm long, narrowly oblong, hyaline, usually 1-nerved, often pilose on the margins, apex 2-lobed, awned from between the lobes; awn 1.5–2.0 cm long, slender, knee and twisted below, scaberulous; palea 2.5–3 mm long, oblong, hyaline, nerveless, ciliate upwards. Pedicelled spikelets usually reduced, occasionally well developed and male and then of the same shape and size as the sessile. Glumes unequal; lower 5-nerved, acuminate; upper 3-nerved, acuminate; lemmas of both florets, if present, narrowly oblong, acute, 1-nerved, ciliate.

A. laxatus is a rare species occurring in Angola, Rhodesia, Zambia and the Congo Republic. It has been recorded only once from South Africa, namely at Graskop in the Pilgrims Rest district of the Transvaal. It usually grows in wet places, near streams or in vleis.

TRANSVAAL.—Pilgrim's Rest: Graskop, Driekop Gorge, *De Winter & Codd* 218.

ANGOLA.—Huila: Humpata, *Texeira* 3411. Moxico: *Milne-Redhead* 4217.

ZAMBIA.—Mwinilunga: Sinkabolo Dambo, *Milne-Redhead* 4380. Barotseland: 10 miles N. of Senanga, *Codd* 7281.

CONGO.—Leopoldville: Kwango, *Devred* 1495.

This species is very closely related to *A. huillensis* but is a shorter, less robust plant with 2, rarely 3, racemes to the inflorescence. The lemma of the upper floret is shorter, 2–3 mm long, but with a much longer awn, 15–20 mm long, than is found in *A. huillensis*.

Of the syntypes only *Mundy* s.n. from Salisbury was seen and consequently no lectotype was selected.

4. *A. festuciformis* Rendle in Cat. Afr. Pl. Welw. 2: 145 (1899); Clayton in Kew Bull. 17: 470 (1964). Type: Angola, Huila, Humpata, *Welwitsch* 7505 (BM, holo.; PRE, photo!).

A. schlechteri Hack. in Bull. Herb. Boiss. ser. 2, 6: 703 (1906). Type: Natal, Clairmont, *Schlechter* 3143 (Z, holo.; BOL!).

Hypogynium schlechteri (Hack.) Pilger in Pflanzenfam. ed. 2, 14e: 156 (1940); Chippindall in Gr. & Pastures S. Afr. 1: 516 (1955).

Perennial, densely tufted, subflabellate. Culms up to 100 cm long, erect, simple below but branched upwards, compressed, smooth and often glossy, usually purplish, 2–3-noded. Leaves up to 30 cm long and 3 mm wide, rigid, folded, linear, passing gradually into the sheath, pubescent on the upper surface near the base, apex acute; ligules 1 mm long, membranous, acute; sheaths striate, persistent, firm, often tinged with purple, lower compressed and keeled, glossy. Inflorescence of solitary, peduncled racemes, crowded to form a narrow panicle 5–15 cm long or scattered along the culm; spathes scarious, narrow, the lower 2–3 cm long, decreasing in size upwards, acute, usually tinged with purple. Racemes 2–4 cm long, straight, glabrous; joints and pedicels unequal, 4–5 mm long, linear, straight, often with a shallow median groove, scaberulous, apex truncate. Sessile spikelets female, 4–4.5 mm long, linear-lanceolate; callus short, obtuse, shortly bearded. Glumes subequal; lower 3.5–4 mm long, linear-lanceolate, bicarinate, subcoriaceous, scaberulous on the keels in the upper half, dorsally shallowly grooved, 1-nerved in each keel, apex minutely bifid; upper 3–3.5 mm long, boat-shaped, sharply keeled, subcoriaceous, 1-nerved, scaberulous on the upper half of the keel, apex acute. Lower floret reduced to the lemma, 2.5–3 mm long, narrowly oblong, membranous, nerveless, apex obtuse or truncate. Upper floret with the lemma lanceolate, 2–2.5 mm long, membranous, 1-nerved, apex shortly bilobed or subacute, awnless; palea absent; anthers reduced to staminodes. Pedicelled spikelets male, 5.6–6 mm long, lanceolate. Glumes subequal; lower 5.6–6 mm long, narrowly ovate, subcoriaceous, 5–7-nerved, glabrous, apex acuminate; upper 4.7–5 mm long, subcoriaceous, narrowly ovate, 5–7-nerved, apex acuminate. Lower floret with the lemma 3.5–4 mm long, lanceolate, membranous, 3-nerved, apex obtuse. Upper floret with the lemma 3.2–4 mm long, narrowly lanceolate, membranous, 1-nerved, apex acute; palea absent; anthers 2.5 mm long.

Andropogon festuciformis has been recorded from Natal, Angola, Zambia, the Congo Republic and the Guinea Republic. It usually grows in damp places, often in vleis.

NATAL.—Durban: Clairmont, *Medley Wood* 8543. Hlabisa: W. of St. Lucia Estuary, *Feely & Ward* 9; Umfolozi flats near Mtubatuba, *Liebenberg* 5911. Pietermaritzburg: Table Mtn., *Killick* 284.

This species differs from all the other South African species in having solitary racemes. Until recently it was placed in the genus *Hypogynium* Nees and was separated from *Andropogon* mainly on account of the awnless lemmas of the sessile spikelets and the solitary racemes. W. D. Clayton in the Kew Bulletin (1964) points out that a few species of *Andropogon* in the section *Piestum* (e.g. *A. textilis*) also have solitary racemes and that these characters are not sufficient to justify a separate genus. In *A. brazzae* (see p. 15) the sessile spikelets are awnless as in *A. festuciformis*.

5. *A. platybasis* J. G. Anderson in Kirkia 1: 102 (1961). Type: Transvaal, Belfast, 5½ miles from Dullstroom on road to Lydenburg, *De Winter & Codd* 180 (PRE, holo.!).

Perennial, tufted with a short rhizome. *Culms* up to 75 cm long, erect, simple, 2–3-noded, glabrous, striate, compressed; nodes glabrous, internodes glabrous and smooth except for the upper which are pilose for approximately 3 cm below the inflorescence. *Leaves* up to 15 cm long, 3–4 mm wide, folded or expanded in the upper half, linear with the apex acute, glabrous, occasionally with a few long hairs near the ligules, margins scaberulous; sheaths strongly compressed and keeled, glabrous, striate, pallid or suffused with purple, basal persistent; ligules fimbriate, membranous, 1 mm long. *Inflorescence* of 3, occasionally 2, spike-like racemes arranged digitately or subdigitately. *Racemes* 2–3 cm long, straight, greyish-violet; joints and pedicels 2–3 mm long, linear, pilose on the margins. *Sessile spikelets* female with the anthers reduced to staminodes, 5–6 mm long, lanceolate. *Glumes* subequal, membranous, glabrous; lower 5–6 mm long, narrowly lanceolate, minutely 2-dentate, concave between the keels with 2 nerves in each keel, scaberulous from the middle upwards; upper 3·6–4 mm long, narrowly boat-shaped, 3-nerved with the faint lateral nerves often anastomosing with the distinct midnerve, midnerve excurrent into a 1 mm long awn. *Lower floret* reduced to the lemma, 4 mm long, margins inflexed, hyaline, nerveless, margins ciliate in the upper half. *Upper floret* with the lemma 2 mm long, lobed to about the middle, awned from between the lobes; awn 9–12 mm long, lobes ciliate; palea 0·75 mm long, truncate hyaline, nerveless. *Pedicelled spikelets* male, 6–7 mm long, lanceolate. *Glumes* membranous; lower with a distinct midnerve and 3–4 nerves on either side, keeled with the keels scaberulous in the upper half, entire at the apex or with 2 membranous lobes on each side of the slightly excurrent nerve; upper narrowly boat-shaped, 7 mm long, 3-nerved, membranous, apex mucronulate. *Lower floret* reduced to the lemma, 5·5–6 mm long, lanceolate, 3-nerved with a distinct midnerve and a faint lateral nerve on either side, apex obtuse. *Upper floret* male; lemma and palea absent; anthers 3 mm long.

A. platybasis is a rare species recorded from the Belfast, Lydenburg and Wakkerstroom districts of the eastern Transvaal and from Mbabane in Swaziland. It is a water-loving grass growing in marshy soils, on streambanks and at high altitudes.

TRANSVAAL.—Belfast: 6 miles N.E. of Dullstroom, *Codd & De Winter* 3225. Lydenburg: 13·6 miles from Lydenburg on road to Sabie, *De Winter & Codd* 199. Wakkerstroom: Oshoek, *Devenish* 910.

SWAZILAND.—Mbabane, *Compton* 30984.

A. platybasis is characterised by the upper floret of the sessile spikelet being female with its anthers reduced to very tiny staminodes. It is also readily distinguished from other South African species in being generally a smaller plant with 2–3 short, greyish-violet, racemes.

6. *A. brazzae* Franch. in Bull. Soc. Hist. Nat. Autun 8: 326 (1895); Stapf in Fl. Trop. Afr. 9: 233 (1919); Robyns, Fl. Agrost. Congo Belge 1: 126 (1929). Type: Congo Republic, between Mokeno and Mongo, *Brazza* 234 (P, holo., iso.!, PRE, photo.!).

A. appendiculatus Nees var. *genuinus* sensu Dur. & Schinz, Etudes Fl. Congo 314 (1896), non Hack. (1889), fide Stapf.

Perennial, densely tufted with a short rhizome. *Culms* up to 250 cm long, erect, stout, slightly compressed and simple below with a few long, erect, flowering branches higher up, often channelled, glabrous and smooth, 3-many noded. *Leaves* up to 50 cm long and 5 mm wide, linear, long attenuate to a fine apex, expanded or revolute in dried specimens, puberulous on both surfaces, margins scabrid to spinously ciliate; ligules membranous, ciliolate, 2 mm long, rounded; sheaths up to 20 cm long and

1 cm broad, lowest and intermediate compressed and strongly keeled, firm, striate, glabrous, often tinged with purple. *Inflorescence* of 3–15 racemes, simple or divided; spathes like the preceding leaves but with reduced blades. *Racemes* 3–10 cm long, slender, loose and often flexuous, glabrous, pale or purple-brown, joints 4–7 mm long, linear, slender, slightly thickened upwards, glabrous, scaberulous or shortly ciliate on the margins, transparent towards the middle line, tips minutely cupular and denticulate; pedicels similar, 3.5–5 mm long. *Sessile spikelets* hermaphrodite, 4–6 mm long, linear-lanceolate, loosely wedged in between joint and pedicel; callus short, obtuse, glabrous. *Glumes* subequal; lower 4–6 mm long, subcoriaceous, keeled, shallowly concave and hyaline between the keels; keels smooth in the lower half, scabrid upwards, 2-nerved in each keel, apex bifid or acuminate; upper 4.5–5 mm long, membranous, boat-shaped, acuminate, 3-nerved with the midnerve distinct, the lateral nerves shorter and finer, glabrous or dorsally scabrid in the upper part of the midnerve. *Lower floret* reduced to a lemma 3.5–5 mm long, membranous, hyaline, lanceolate, acute or acuminate, indistinctly 3-nerved, winged in the upper half, glabrous or ciliolate on the margins. *Upper floret* with the lemma 4.5–5 mm long, membranous, hyaline, 1-nerved or indistinctly 3-nerved, glabrous, acute, mucronate or rarely with rudiments of an awn up to 1.5 mm long; palea 1–1.5 mm long, ovate-oblong, hyaline, nerveless; anthers 2 mm long. *Pedicelled spikelets* male, 4–6 mm long. *Glumes* subequal; lower 4–6 mm long, linear-lanceolate, subcoriaceous, keeled, 5-nerved with a distinct midnerve and 2 nerves close together in each keel, keels scabrid in the upper half, apex acute or acuminate; upper 4–5 mm long, lanceolate, often winged in the upper half, membranous, glabrous or ciliolate on the margins, 3-nerved, acuminate or often mucronate. *Lower floret* reduced to a lemma 3–4 mm long, membranous, hyaline, winged in the upper half, glabrous or ciliolate on the margins, indistinctly 3-nerved, apex acute. *Upper floret* with the lemma 3–3.5 mm long, lanceolate, glabrous, hyaline, obscurely 1–3-nerved, mucronulate; palea 1 mm long, ovate-oblong, hyaline, nerveless; anthers 2 mm long.

A. brazzae has been recorded from the Okavango Native Territory in South West Africa, Angola and the Congo Republic. It is a rare species found on streambanks or in marshy soils.

SOUTH WEST AFRICA.—Okavango: 16.8 miles W. of Nyangana Mission, *De Winter & Marais* 4775.

ANGOLA.—Moxico: Lusavo Ferry, *Milne-Redhead* 4125.

CONGO REPUBLIC.—Equateur: *Conteaux* 503; 564; Coquihatville, *Germain* 4717; Bondo Village, *Germain* 1934. Leopoldville: Mongobebe, *Flamigny* 5046. Orientale: Ango, *Germain* 4311.

This species is allied to *A. appendiculatus* but differs from that species in that the spikelets are either awnless or do not produce fully developed awns. Investigation of the material deposited in the National Herbarium, Pretoria, revealed that in the sessile spikelets the apex of the lemma of the upper floret is usually acute or mucronate. In some spikelets the midnerve of this lemma is thickened at the apex and frequently produced into an awn up to 1.5 mm long. Other interesting features of this species are that the leaf-blades are frequently revolute in dried specimens and that the leaf margins are often very distinctly spinously ciliate.

7. *A. appendiculatus* Nees, Fl. Afr. Austr. 105 (1841); Steud., Syn. Pl. Glum. 1: 379 (1855); Hack. in DC., Monogr. Phan. 6: 436 (1899); Stapf in Fl. Cap. 7: 339 (1898); Chippindall in Gr. & Pastures S. Afr. 1: 500 (1955). Type: Cape, Klein Buffelvallei, near Gaatjie, *Drege* s.n. (S, lecto.!, SAM!).

A. ischaemum Thunb., Prodr. 20 (1794), non Linn. Type: Cape, *Thunberg* s.n. (S, iso.!). *A. appendiculatus* Nees var. *genuinus* Hack. in DC. Monogr. Phan. 6: 437 (1889). —var. *ischaemum* Nees, Fl. Afr. Austr. 105 (1841). Syntypes: Uitenhage, Van Stadensriver Mtns., *Drege* 696!; Zwartkei River, *Ecklon* s.n.!; Klein Buffelvallei, near Gaatjie, *Drege* s.n.! —forma *purpurea* Nees, l.c., 106 (1841). Type: Winterberg,

Ecklon s.n. —var. *serrulatus* Nees, l.c., 105 (1841), excl. syn.; Hack. in DC., Monogr. Phan. 6: 437 (1889). Syntypes: Waterfall near Tulbagh, *Ecklon* s.n.!; Dutoitskloof, *Drege* s.n.!

Perennial, densely tufted with a creeping, sometimes branched, rhizome. *Culms* up to 120 cm long, glabrous, compressed or terete, 4–6 noded, simple below, remotely branched from the upper 2–3 nodes with 1–3 flowering branches; branches solitary, long, glabrous. *Leaves* mostly basal; blades up to 30 cm long and 5 mm broad, usually folded or sometimes expanded, upper very short or obsolete, rigid, glabrous or bearded near the ligule, acutely keeled, margins scabrid; ligules 1.5–2 mm long, truncate, membranous, ciliolate; sheaths glabrous or bearded at the mouth, lower very firm, strongly compressed, keeled, persistent, upper shorter than the internodes, tight, often tinged with purple. *Inflorescence* of 2–20 racemes; peduncles generally long exserted, glabrous. *Racemes* 4–16 cm long, fascicled, unequal, often slender and loose, usually strongly flushed or wholly dark purple; joints linear, 4–6 mm long, hairy on the convex back, hairs up to 5 mm long, white or yellowish, tips subcupular with irregularly toothed margins; pedicels similar but more slender, produced into a subulate appendage facing the upper glume. *Sessile spikelets* hermaphrodite, 6–7 mm long, lanceolate; callus short, obtuse, scantily bearded. *Glumes* subequal, subcoriaceous to chartaceous; lower 6–7 mm long, lanceolate, dorsally concave, keels acute, scabrid or rigidly ciliate in the upper half, obscurely 3-nerved in each keel, apex bifid, rarely deeply bifid; upper 5.5–6 mm long, boat-shaped, 1-nerved, glabrous or scabrid on the keel. *Lower floret* reduced to the lemma, 5.5–6 mm long, oblong-lanceolate, membranous, obscurely 2-nerved or nerveless, pilose on the margins in the upper half, apex acute. *Upper floret* with the lemma 4.4–5 mm long, membranous, 1–3-nerved, pilose on the margin in the upper half, 2-lobed, lobes acuminate, awned from between the lobes; awn 10–15 mm long, slender, geniculate below the middle; palea 1.2–3 mm long, ciliate, hyaline, nerveless; anthers 4 mm long. *Pedicelled spikelets* male. *Glumes* subequal, subcoriaceous; lower 5.4–6 mm long, oblong-lanceolate, flat or slightly rounded on the back, scabrid or ciliate on the keels in the upper half, keels acute, midnerve prominent and with 3 nerves in each keel, nerves often anastomosing near the apex, minutely awned from a bifid or acute apex; awn 1.7–2 mm long; upper 4.5–5 mm long, oblong-lanceolate, pilose on the margins in the upper half, 1–3-nerved, apex acute or shortly mucronate. *Lower floret* with the lemma 4.5–5 mm long, lanceolate, membranous, 3-nerved or nerveless, reversedly pilose on the margins in the upper half, apex acute. *Upper floret* with the apex of the lemma minutely bifid, otherwise similar to that of the lower floret; palea 3.7–4 mm long, elliptic, membranous, nerveless, ciliate on the margins in the upper half; anthers 3–4 mm long.

This is a common and widespread species in South Africa, in which it is endemic, its distribution ranging from the south-western, eastern and north-eastern Cape to Natal, Swaziland, Transvaal, Basutoland and the Orange Free State. It is absent from the drier areas of the central Cape and South West Africa. *A. appendiculatus* occurs from sea level up to altitudes of 10,000 ft. above sea level in the Natal Drakensberg. It is usually found growing in damp situations, frequently in swampy soils and very often in the shade.

CAPE.—Albany: Grahamstown Nature Reserve, *Britten* 5961. Aliwal North: Elands Hoek, *Bolus* 10505. Barkly East: Ben McDhui, *Galpin* 6896. Caledon: Rivierzondereind, *Schlechter* 9895 (BOL., GRA). Ceres: Koude Bokkeveld, Skurfdebergen, *Schlechter* 10175. Clanwilliam: Sneeuberg, south Cedarberg, *Edwards* 162; Juriesberg, *Compton* 6263 (NBG). Herschel: Majuba Nek, Sterkspruit, *Hepburn* 284 (GRA). Humansdorp: Witte Els Bosch Peak, *Esterhuysen* 6776 (BOL). Keiskamma Hoek: Cata Forest Reserve, *Story* 3279. Kentani: *Pegler* 82. King Williams Town: Amatola Mtns., *Dyer* 268. Knysna: Pirie, *Sim* 2822. Komga: *Flanagan* 1020. Lady Grey: 4 miles W., *Godfrey* 1542. Molteno: *Bews* 80 (NU). Mount Ayliff: Amalfi, *Godfrey & Scott* SH. 1503. Paarl: Du Toits Kloof Mtn., *Tyson* 6040 (SAM). Port Elizabeth: *Liebenberg* 5387. Queenstown: Mtaba Magwele Mtn., *Galpin* 2634. Stellenbosch: Jonkershoek, *Taylor* 3253; 4508. Steynsburg: Molteno Road, *Acocks* 8668. Stutterheim: Fort Cunyngame, *Sim* 2731; *Rogers* 12701. Uniondale: Niekerksberg Forest Reserve, near Misgund, *Taylor* 3259. Worcester: Hex River Valley, *Tyson* s.n. (GRA).

BASUTOLAND.—Leribe: *Dieterlen* 349; 6323 (SAM). Maseru: Maluti Mtns., *Staples* 158; Roma, *Schutte* s.n. (BOL). Quachas Nek: valley of the Legowa River, *Pole Evans* 84. Quthing: above Mphaki, *Archibald* 534 (GRA).

ORANGE FREE STATE.—Bethlehem: ravine near village, *Phillips* 3099. Ficksburg: Riverhill Farm, *Potts* 3687. Harrismith: Van Reenen, *Bews* 81; 82; 83 (NU). Heilbron: Maccauvlei, *Brandmuller* 3. Kroonstad: *Pont* 152. Senekal: Doornkop, *Goossens* 885. Winburg: 10 miles N., *Godfrey* SH. 1561. Zastron: " Mooifontein ", *Liebenberg* 5247.

NATAL.—Bergville: Mont-aux-Sources, *Bayer & McClean* 317; Cathedral Peak Forest Res. Stn., *Killick* 1153. Dundee: Vants Drift, *Codd* 186. Durban: *Wood* 6049 (GRA); Umgeni, *Rehmann* 8652 (GRA). Estcourt: Cathkin Peak Hostel, *West* 13; Research Stn., *Acocks* 9958. Klipriver: Acton Homes, *Doidge* s.n. Mapumulo: *Buchanan* 191 (GRA). Mooi River: Meteor Ridge, *Mogg* 3388. Mpendle: *Huntley* 456. Nkahlia: Qudeni Forest Reserve, *Fisher & Schweickerdt* 40 (NH). Mtunzini: " Homewith ", *Mogg* s.n. Newcastle: road to Utrecht, *Edwards* 628. New Hanover: Balgowan, *Mogg* 3546. Nqutu: *Codd* 239. Utrecht: Doringkop, *Edwards* 1037; Boshoffs Vlei, *Edwards* 1046.

SWAZILAND.—Mbabane, *Compton* 23763; 23840 (NBG); *Rogers* 11609 (BOL).

TRANSVAAL.—Belfast: Dullstroom, *Galpin* 13030. Benoni: *Bradfield* 372. Bethal: *Leendertz* 10532. Bronkhorstspuit: on road to Pretoria, *De Winter & Codd* 167. Carolina: 19 miles S.E. of Machadodorp, *Codd* 8278. Ermelo: Maviristad, *Pott* 5208; Athole Pasture Research Stn., *Norval* 52; Nootgedacht, *Henrici* 1284; 1299. Heidelberg: Henley on Klip, *Stent* H.21584. Johannesburg: *Leendertz* 6062; *Burt Davy* 832; Canada Junction, *Cohen* 871. Lydenburg: Zwagershoek, *Obermeyer* s.n. Pietersburg: Blaauwberg, on Mohlakeng Plateau, *Codd & Dyer* 8989. Pilgrim's Rest: Mt. Anderson, *Pole Evans* 3794. Potchefstroom: Welverdiend, *Louw* 874 (GRA). Pretoria: Doornkloof, Irene, *Pole Evans* 382; Wolwekloof, *Mogg* 15909; Rayton, *Schweickerdt* 1698; Wonderboom South, *Louw* 863. Schweizer-Reneke: *Burt Davy* 1697. Soutpansberg: Tzaneen, *Sampson* 141. Standerton: Beginsel, *Burt Davy* 926. Swarttruggens: *Sutton* 933. Vereeniging: Deneysville, *Chippindall* 343; Volksrust: *Burt Davy* 150. Wakkerstroom: Oshoek, *Devenish* 1118; Jantjies Hoek pass, *Galpin* 70217. Wolmaransstad: Oersonskraal 16, *Sutton* 77.

This species is variable as may be expected when its wide distribution and its occurrence in a wide range of habitats is taken into consideration yet it is, on the whole, easily recognizable and distinct.

When describing the species, Nees (1841) divided it into var. *serrulatus*, var. *ischaemum* and the forma *purpurea*, on grounds of the size of the spikelets and the difference in pubescence of the lemma of the sessile spikelets. Hackel (1889) retained the var. *serrulatus* but placed the var. *ischaemum* and forma *purpurea* in synonymy under his variety *genuinus*.

When studying the herbarium material, I found that a small form with conspicuously hairy racemes, as well as forms with more numerous, but less hairy racemes, occur in the south-western Cape. From this area to the northern provinces the species shows a gradual decrease in pubescence as well as an increase in size of plants and of the number of racemes to the inflorescence. A taller plant with several, almost glabrous racemes, is found in the Transvaal, Natal, and Orange Free State. The size of spikelets and degree of pubescence of the lemma of the sessile spikelets is not correlated with the different forms.

Study of a large range of material has thus shown that, in spite of the extreme variability, there is no valid reason for subdividing this species into subordinate taxa.

8. *A. abyssinicus* R. Br. in Fres. Mus. Senkenb. 2: 146 (1837); Steud., Syn. Pl. Glum. 1: 371 (1855); Hack. in DC., Monogr. Phan. 6: 465 (1889); Stapf in Fl. Trop. Afr. 9: 222 (1919); Chippindall in Gr. & Pastures of S. Afr. 1: 496 (1955). Type: Abyssinia, *Salt* s.n. (BM, holo.; PRE, photo.).

Annual, loosely tufted. Culms up to 70 cm long, geniculate, 2-4-noded, simple or sparingly branched from below or at the middle, terete, glabrous, smooth, the internodes channelled downwards. Leaves up to 25 cm long and 4 mm wide, expanded, narrowly linear, long tapering to an acute apex, glabrous or sparingly hairy from minute tubercles, midrib prominent below, broader and whitish above; ligules 0.5 mm

long, membranous, fimbriate, truncate; sheaths terete, glabrous or sparingly hairy from minute tubercles, smooth, shorter than the internodes. *Inflorescence* of 2 racemes, one sessile, the other with a short hairy base. *Racemes* 8–10 cm long, densely whitish-villous; joints and pedicels 3.5–4 mm long, narrowly cuneate-linear, transparent between the thickened edges, densely hairy on the back and sides with the hairs approximately 3 mm long, tips on one side produced into a short, membranous, crenulate auricle. *Sessile spikelets* 6–8 mm long, oblong-lanceolate. *Glumes* subequal, membranous; lower dorsally flattened, densely hairy, hairs approximately 4 mm long, keeled, keels with very narrow subhyaline wings, intracarpal nerves 6–7, evenly distributed, apex minutely bifid; upper narrowly boat-shaped, sparingly hairy, 3-nerved, apex with a bristle 5.7–6 mm long. *Lower floret* reduced to a 5 mm long lemma, linear-oblong, hyaline, nerveless, ciliate. *Upper floret* hermaphrodite; lemma 4.7–5 mm long, cuneate-oblong, 3-nerved below, 2-lobed to about the middle, awned; lobes acute, ciliate; awn about 12 mm long, fine, bent at and twisted below the middle; palea absent; anthers imperfect, 1–2 mm long. *Pedicelled spikelets* 6–8 mm long, male or hermaphrodite. *Glumes* subequal; lower long hairy on the back, keels narrowly winged, many nerved, nerves very fine and close with a prominent midnerve, apex 2-mucronate with a fine bristle 4–5 mm long from between the mucros; upper subhyaline, long hairy on the back, 3-nerved, apex acute or aristulate. *Lower floret* with the lemma 4.5–5 mm long, oblong, faintly 2-nerved, ciliate, apex obtuse. *Upper floret* with the lemma lanceolate-oblong, bifid, ciliate, often with a mucro from the sinus or more or less reduced and entire with a male or hermaphrodite flower; anthers 2–3 mm long.

This species has been recorded from Abyssinia, Uganda, Malawi, the Cape and Natal. In the Republic it is restricted to the Drakensberg, where it grows on mountain slopes at altitudes ranging from 5,000–9,000 feet.

NATAL.—Estcourt: Ntabamhlope Mtn., *West* 41. Newcastle: Normandien Pass, *Edwards* 2819.

CAPE.—Maclear: 23 miles N., *Theron* 2203.

UGANDA.—Kigezi: *Greenway & Eggeling* 7144; *Kashenji, Johnston* 1375.

The holotype of this species was not seen but the South African material was compared with the description and with a photograph of the holotype in the National Herbarium, Pretoria. It is also identical with *Schimper* 223b, collected in Abyssinia on Mt. Sholoda. The latter specimen is quoted by *Stapf* (1919) and is deposited in Kew.

9. *A. pilosellus* *Stapf* in *Fl. Trop. Afr.* 9: 221 (1919). Type: Eritrea, Amasen, At-Zien, *Pappi* 5285.

Perennial, loosely tufted with a short oblique rhizome. *Culms* up to 20 cm long, geniculate, slender, simple, 2–3-noded, glabrous, smooth. *Leaves* up to 10 cm long and 3 mm broad, expanded, linear from a narrow base, sparingly hirsute on both surfaces with bulbous based hairs, margins scabrid, apex acute; ligules 1.5 mm long, membranous, obtuse; sheaths terete, sparingly hirsute with bulbous based hairs, persistent. *Inflorescence* of 2 racemes, one sessile, the other with a short hairy base. *Racemes* 3.5 cm long, straight, yellow-green to purplish; joints and pedicels linear, 3–3.5 mm long, subtransparent between the thickened edges, ciliate on both margins with hairs 1.5–2 mm long, tips cupular, truncate. *Sessile spikelets* hermaphrodite, 7 mm long, lanceolate-oblong; callus short, obtuse, densely bearded. *Glumes* subequal; lower 7 mm long, lanceolate-oblong, 7-nerved, subchartaceous, dorsally shallowly concave, long hirsute, unequally winged from the keels, one wing very narrow, scabrid, apex unequally 2-dentate, each tooth with a fine mucro; upper 6 mm long, narrowly boat-shaped, membranous, 3-nerved, shortly pilose on the margins, keel scabrid, apex minutely bifid, awned, awn 3 mm long. *Lower floret* reduced to the lemma, 5 mm

long, oblong-lanceolate, hyaline, 2-nerved, sparingly pilose on the margins, apex acute. *Upper floret* with the lemma 4 mm long, hyaline, 1-nerved, lobed to about the middle, awned, awn 8 mm long, bent at and twisted below the middle; palea absent. *Pedicelled spikelets* neuter, reduced to the glumes; lower 4.5 mm long, lanceolate-oblong, hirsute, 7-nerved, apex minutely bifid, shortly mucronate; upper 2 mm long, oblong, hyaline, nerveless, apex truncate.

NATAL.—Bergville: Drakensberg, low area pass between Saddle and Twins, *Edwards* 2133.

The plant, from which the above description was drawn up, was collected on the Drakensberg in Natal in July, 1957, at an altitude of 9,200 feet. To my knowledge this is the only record for South Africa. It compares very well with Stapf's description of *A. pilosellus* in the Flora of Tropical Africa (1919) and could possibly be a depauperate specimen of that species. I have not seen the type of *A. pilosellus*, *Pappi* 5285, collected at At-Zien in Eritrea, but *Edwards* 2133 was sent to Kew for comparison. Mr. W. D. Clayton kindly examined it and reported that it was probably *A. pilosellus* but that a definite identification would not be possible until a detailed study of the East African montane species of *Andropogon* had been made.

10. *A. lacunosus* J. G. Anderson in *Bothalia* 8: 113 (1962). Type: Transvaal, Ermelo, Athole Pasture Research Station, *Gericke* A. 49 (PRE, holo.!).

Perennial, caespitose with a short rhizome. *Culms* up to 80 cm long, erect, slender, glabrous, striate, often grooved, terete or the basal internodes slightly compressed, 2-4-noded; nodes glabrous. *Leaves* up to 20 cm long and 5 mm wide, narrowed towards the base and tapering to an acute apex, broadest at about the middle, 7-nerved with the midnerve prominent abaxially, sparsely to densely pilose with bulbous-based hairs between the nerves, often densely pilose near the ligule; ligules 1 mm long, membranous, ciliolate, truncate; basal sheaths often tinged with purple. *Inflorescence* of 2-3 racemes, 5.5-7 cm long; joints and pedicels linear, 3-4.5 mm long, margins pubescent. *Sessile spikelets* hermaphrodite, 6-8 mm long, linear. *Glumes* unequal; lower 6-8 mm long, narrowly-lanceolate, deeply grooved on the back, the groove densely pilose in the lower and with 5-8 variably shaped shallow pits on either side of the groove, chartaceous, 7-9-nerved, keeled with the keels narrowly winged, ciliate in the upper half, apex obscurely bifid; upper 5-6 mm long, narrowly boat-shaped, thinly membranous, 3-nerved with the midnerve distinct and produced into a 1-3 mm long scabrid bristle, lateral nerves obscure, margins narrowly winged upwards, wings pilose along the margins, apex obtuse. *Lower floret* reduced to the approximately 5 mm long lemma, lanceolate, hyaline, nerveless, margins inrolled and pilose in the upper half, apex obscurely bifid. *Upper floret* bisexual with the stamens reduced to staminodes; lemma 4.7-5 mm long, linear, hyaline, nerveless, lobed to about the middle, lobes acute, pilose along the margins in the upper half, awned from between the lobes; awn slender, 10-15 mm long; palea absent. *Pedicelled spikelets* male, 8-9 mm long. *Glumes* unequal; lower 8-9 mm long, lanceolate, chartaceous, keeled, keels and margins pilose, 11-nerved with the nerves grouped together, one group of 3 in the middle and 2 marginal groups of 4 each, with 2 longitudinal grooves and 5-12 variably shaped, shallow pits on the back, midnerve excurrent into a very short bristle or apex acute; upper 7.5-8 mm long, lanceolate, membranous, 3-5-nerved, obscurely winged, pilose on the margins, apex acuminate. *Lower floret* reduced to the lemma, 6.5-7 mm long, hyaline, obscurely 2-nerved, pilose on the margins; palea absent. *Upper floret* male, lemma about 4.5 mm long, hyaline, nerveless, pilose along the margins, apex emarginate; palea absent; anthers linear, 4 mm long.

This species is rare and has been found only in the Ermelo, Groblersdal, Belfast, Lydenburg, Pilgrims Rest and Wakkerstroom districts of the eastern and north-eastern Transvaal. It occurs in vleis and near streams, usually in sandy soils, at altitudes ranging from 4,700-6,800 feet.

TRANSVAAL.—Belfast: Dullstroom, *Hector* s.n. Ermelo: Athole Pasture Research Station, Letole River, *Malherbe* 54; *Norval* 8; 122. Groblersdal: 28½ miles N.E. by E., *Acocks* 20908. Lydenburg: 15 miles W. of Sabie, *Codd* 6441. Pilgrim's Rest: Mariepskop, *Meuse* 9940; near Reitz's grave, *Van der Schijff* 5992; 6 miles N. of Graskop, *Codd* 6450. Wakkerstroom: Oshoek, *Devenish* 1090.

A. lacunosus is a distinct species and is unique in the genus *Andropogon* because of the shallow, variably shaped pits on the lower glumes of both the sessile and pedicelled spikelets.

11. *A. amplexens* Nees, Fl. Afr. Austr. 104 (1841); Steud., Syn. Pl. Glum. 1: 372 (1855); Hack. in DC., Monogr. Phan. 6: 453 (1889); Stapf in Fl. Cap. 7: 342 (1898); Fl. Trop. Afr. 9: 243 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 498 (1955). Type: Cape, "between Omtata and Omgaziana", *Drege* s.n.

Perennial, densely tufted. Culms up to 150 cm long, slender, few-9 noded, erect or rarely subdecumbent, glabrous, smooth. Leaves glabrous, or rarely hairy to densely pubescent; blades linear from a wider rounded base or those of the culms cordate or subcordate and amplexicaul, tapering to a long setaceous apex, up to 30 cm long and 10 mm wide at the base, those of the innovations up to 15 cm long and 2.5 mm wide, subglaucous or suffused with purple, usually glabrous, rarely with a few scattered hairs or densely pubescent, margins somewhat scabrid; ligules 1 mm long, membranous, fimbriate, truncate or rounded; sheaths terete, tight, glabrous, the lowest and those of the innovations short, sometimes purplish, subsistent. Inflorescence of 2, rarely 3 racemes; spathes linear-lanceolate, long tapering upwards, glabrous, pale green, at length tightly inrolled; spatheoles similar to the spathes, about 8 cm long, tapering to a setaceous point; peduncles exerted. Racemes 5-8 cm long, straight or somewhat flexuous; joints and pedicels very similar, 5-6 mm long, clavate or cuneate, distinctly swollen upwards, densely ciliate on the margins, tips produced into very oblique, slightly denticulate cupules. Sessile spikelets hermaphrodite, 7-9 mm long, laterally compressed, wedged in between joint and pedicel, linear-oblong, glabrous, green, often reddish towards the tips; callus acute to subacute, 2 mm long, shortly bearded. Glumes equal; lower 7.5-8 mm long, lanceolate, keeled with the keels rounded, broad and smooth below, acute and scabrid near the tips, narrowly grooved between the keels and with 2 fine lateral furrows in the upper third, apex bifid; upper 7.5-8 mm long, boat-shaped, subcoriaceous, 1-nerved, glabrous or the nerve dorsally scabrid, apex mucronate or aristulate. Lower floret reduced to the lemma, 5-6 mm long, lanceolate, nerveless or faintly 2-3-nerved, sparingly ciliate, hyaline, apex acute. Upper floret hermaphrodite; lemma 5-7.6 mm long, linear-lanceolate, sparingly ciliate, 3-nerved, deeply lobed, lobes acute, awned from between the lobes, awn stout, 3.5-5 cm long, kneed and pubescent below the middle; palea 1.6-2 mm long, linear-oblong, nerveless, ciliate; anthers 4 mm long. Pedicelled spikelets male, 9-12 mm long, lanceolate-acuminate, dorsally compressed. Glumes subequal; lower 9-12 mm long, subherbaceous, linear-lanceolate, many-nerved between the scabrid keels, usually produced into an awn 2-8 mm long; upper 9-11 mm long, linear-lanceolate, 3-5-nerved, sparingly ciliate on the keels, apex acuminate. Lower floret reduced to the lemma, 6-9 mm long, membranous, linear-lanceolate, faintly 3-nerved, apex acute. Upper floret with the lemma 6-8 mm long, membranous, 1-nerved, apex bifid; palea 2-3.5 mm long, membranous, nerveless; anthers 4.4-5 mm long.

This species occurs from the East London district of the eastern Cape to Natal and Swaziland and is widely distributed and common in the Transvaal. From here it extends into the Orange Free State and northern Cape. It has also been recorded from Bechuanaland, Mozambique, Rhodesia, Malawi and the Congo Republic. It usually occurs in dry open veld and on hillsides, but is often found also in marshy areas and other moist situations.

CAPE.—Barkly West: Daniels Kuil, *Gers* 2999 (KMG). East London: Kidds Beach, *Comins* 1484 (GRA). Hay: Jaspas Hill at Clifton, *Acocks* 2142. Kentani: near Kei Mouth, *Flanagan* 981; *Pegler* 1056. Kuruman: *Pole Evans* 2414; *Marloth* 1114 (GRA). Mount Currie: Clydesdale, *Tyson* 931 (SAM). Tsolo: Umtwynkwa Cutting, *Galpin* 6893. Umtata: "Morely", *Drege* s.n. (K, S). Vryburg: Armoedsvlakte, *Henrici* 44; Bietjiesvlakte, *Henrici* 73.

ORANGE FREE STATE.—Heilbron: Maccauvlei, *Brandmuller* 42. Kroonstad: Vals River, *Pont* 27; 143. Ventersburg: 12 miles S., *Godfrey* SH. 1563.

NATAL.—Bergville: Ladysmith road, *Edwards* 661. Camperdown: Nagle Dam, *Wells* 1190 (NU); 1865. Estcourt: *Acocks* 11454. Hlabisa: Hluhluwe Game Reserve, *Ward* 1977. Lions River: *Moll* 617. Nkandla: Qudeni, *Edwards* 1297. Pietermaritzburg: Albert Falls, *Comins* 265 (NU). Port Shepstone: Port Edward, *Huntley* 720; Oribi Flats, *McClellan* 528. Tugela: Bulwer Farm, *Edwards* 1920. Ubombo: Mpangazi Lake, *Strey & Huntley* 5017. Umzinto: Dumisa Station, *Rudatis* 884. Upumulo: *Buchanan* 194 (BOL, NH).

SWAZILAND.—Mbabane: Ngweni Mtn. Range near Forbes Reef, *Meeuse* 10136; Ukutula, *Compton* 25787; 26698.

TRANSVAAL.—Brits: Jacksonstun, *Van Vuuren* 379. Delmas: *Schmelz* 16 (GRA). Ermelo: Experimental Farm, *Burt Davy* 7720. Heidelberg: Henley-on-Klip, *Stent* s.n.; Uitgevallen 197, *Burt Davy* 13667. Johannesburg: 8 miles S., *Lintner* 45; Houghton, *Cohen* 650. Letaba: The Downs, *Junod* 4096; Duiwelskloof, *Scheepers* 822. Lichtenburg: Grasfontein, *Sutton* 392. Marico: *Liebenberg* 5321. Nelspruit: Nohpe, *Van der Schijff* 1512; Shabin Kop, *De Winter & Codd* 458. Pietersburg: Iron Crown Peak, *Swanepoel* s.n. Potchefstroom: *Burt Davy* 2700. Pretoria: Doornkloof, *Pole Evans* 351; Hoorns Nek, *Codd* 770; Onderstepoort Station, *Smith* 6169; Premier Mine, *Rogers* 25048. Ventersdorp: Palmietfontein, *Botha* 26. Vereeniging: Leeukuil, *Stony* 91. Warmbad: *Pole Evans & Smuts* 690. Waterberg: Nooitgedacht 699, *Acocks & Naude* 31.

BECHUANALAND.—Lobatsi: Kanye, *Miller* B/304.

RHODESIA.—Bubi: Gwampa Forest Reserve, *Goldsmith* 37/56. Matobo: Matopos, *Rattray* 300. Que Que: Gokwe, *Bingham* 481A.

MOZAMBIQUE.—Beira: Dondo, *Torre* 5899; Santaca, Maputo, *Gomes & Sousa* 3955.

I have not seen the type specimen of *A. amplexens* but the South African material agrees with the description by Nees (1841) and with a specimen collected by Drege simultaneously with the type. The latter specimen was recorded from "Morely" in the Umtata district and as this is the type locality there is no doubt as to the identity of the species.

A. amplexens is a distinct species with the culm leaves characteristically rounded or subcordate and subamplexicaul at the base, tapering sharply to a long, fine, apex. The leaves and culms may be dark green or frequently tinged with red, purple or brown. In its early and flowering stages the plant is usually conspicuously glaucous.

The width of the leaf-bases and the pubescence of the vegetative parts of the plant vary considerably. Examination of the South African material revealed that the leaf-bases are from 2.5 mm to 1.3 cm wide. This variation occurs in plants from the same locality and even in leaves on the same plant. For this reason I am reluctant to include any of the broad-leaved South African plants in the var. *diversifolius* (Rendle) Stapf, described originally from Angola.

It is of interest to note that plants collected along the coast in the Port Shepstone district of Natal often have a subdecumbent or sprawling habit, with leaves 5–12 cm long and 6–10 mm wide.

12. *A. schinzii* Hack. in DC., Monogr. Phan. 6: 458 (1889); Stapf in Fl. Cap. 7: 341 (1898); Fl. Trop. Afr. 9: 245 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 499 (1955). Type: South West Africa, Amboland, Oshando, *Schinz* 670 (Z, holo.!, BOL, iso.!, PRE, photo.!, fragment!).

A. schinzii Hack. ex Schinz in Verh. Bot. Ver. Brandenb. 30: 139 (1888), nom. nud.

Perennial, densely tufted with a slightly bulbous base. Culms up to 120 cm tall, erect, slender, glaucous, glabrous, terete or often channelled, simple and sometimes woody below with barren solitary or fascicled branches from the lower nodes and few

solitary (rarely 2-3-nate) leafy long and erect flowering branches higher up. *Leaves* up to 30 cm long and 8 mm broad, linear from a narrow base, long tapering to a fine apex, slightly rough or puberulous on both surfaces, rarely with some additional very long and spreading hairs near the ligule; ligules 1-2 mm long, membranous, truncate, laterally produced and adnate to the auricles of the sheath; sheaths terete, tight, glabrous, firm, the lower and intermediate mostly longer than the internodes, shortly auricled at the mouth, the basal long, persistent. *Inflorescence* of 2 racemes, conspicuously hairy from the long soft hairs on the joints and pedicels; spathes subherbaceous, green, sometimes faintly tinged with purple, at length tightly inrolled with a more or less reduced blade. *Racemes* 5-8 cm long, one sessile, the other with a short base, straight or flexuous, villous, dull or yellow-green, sometimes purplish; joints and pedicels equal or subequal, cuneate, stout above, much attenuated towards the base, 4-5 mm long, rigidly ciliate on both margins, cilia 3.5-4.5 mm long, tips obliquely cupular, minutely dentate. *Sessile spikelets* hermaphrodite (except the lowest 1 or 2 of the sessile raceme), 6-7 mm long, narrowly linear, laterally compressed, loosely wedged in between joint and pedicel; callus short, obtuse, shortly bearded. *Glumes* subequal; lower 6-7 mm long, subcoriaceous, keeled with a deep narrow hyaline groove between the keels, nerves 4 on each side, one close to the groove, the other in the keels; keels obtuse and smooth in the lower three-quarters, acute and scaberulous upwards, apex minutely bifid; upper boat-shaped, 6-7 mm long, membranous, 3-nerved, pilose on the margins, awned, awn 7-10 mm long, fine, straight. *Lower floret* reduced to a lemma, 5.5-7 mm long, linear-oblong, 2-nerved, pilose on the margins, hyaline, apex acute or obtuse. *Upper floret* hermaphrodite, lemma 5-6 mm long, oblong, 3-nerved below, pilose on the margins, conspicuously 2-lobed, lobes acute, awned from between the lobes, awn slender, 25-35 mm long, geniculate, scaberulous; palea 3-5 mm long, linear-oblong, hyaline, nerveless; anthers 3-4 mm long. *Pedicelled spikelets* male, dorsally compressed, oblong or lanceolate-oblong, acute, purplish or reddish. *Glumes* subequal; lower flat or rounded on the back, 5-6 mm long, membranous, keeled, keels ciliate, awned from a bifid apex, awn 5-7 mm long, fine, straight; upper submembranous, 6-7 mm long, 3-nerved, pilose on the margins in the upper half, awn 1-2 mm long. *Lower floret* reduced to the lemma, 6-7 mm long, hyaline, 2-nerved, narrowly keeled, pilose on the margins. *Upper floret* with the lemma 6-7 mm long, hyaline, 3-nerved, pilose on the margins, apex mucronulate; palea 4.5-5 mm long, hyaline, nerveless, apex obtuse or acute; anthers 3-4 mm long.

A. schinzii is found in several districts of the Transvaal, the Hay, Postmasburg and Kuruman districts of the northern Cape and in the central and northern part of South West Africa. It has also been recorded from Swaziland, Bechuanaland, Rhodesia and the Congo Republic. It usually grows on rocky slopes or ledges on hillsides.

CAPE.—Hay: Floradale, *Ferrar* 47; 6098 (KMG); *Esterhuysen* 2368; Bingap, *Acocks* 5730 (KMG, NH, BOL). Griqualand West: Klipfontein, *Burchell* 2164-2 (SAM). Kuruman: Broncote, *Esterhuysen* 1152 (BOL, KMG). Postmasburg: Kaapstewel, *Cooke* s.n. (GRA); 6335 (KMG).

SWAZILAND.—Mbabane: Komati Bridge, *Compton* 26818.

TRANSVAAL.—Krugersdorp: Gladysvale, *Rodin* 3930. Letaba: 17½ miles W. of Letaba Camp, *De Winter & Codd* 692; Duiwelskloof, Westfalia Estate, *Scheepers* 666. Messina: Govt. Ranching Station, *Du Plessis* s.n.; Dongola, *De Winter & Codd* 286. Nelspruit: Skipberg, *Van der Schijff* 3397. Potgietersrus: Pyramid Estate, *Galpin* 8885; Swerwerskraal, *Acocks* 8869; Doornhoek, *Walker* s.n. Pretoria: Klapperkop, *Mogg* 16231; Wonderboom Reserve, *Repton* 2070; Rust der Winter Dam, *De Winter & Codd* 247. Rustenburg: Hexkrantz, *Codd* 1066. Koster River, *Burt Davy* 82. Waterberg: 10½ miles N.E. of Oslo, *Codd* 3998.

BECHUANALAND.—Francistown: between Totume and Bushman Mine, *Pole Evans* 3266; *Gordon* 87; 102.

SOUTH WEST AFRICA.—Grootfontein: Auros, *Volk* 594b; Farm Kumkauas, *Kinges* 2818; 2883; 20 miles W., *Schoenfelder* 26; 5 miles N., *Schweickerdt* 2063. Kaokoveld: Omberera, *De Winter & Leistner* 5487. Otjiwarongo: Ozondjache, *Volk* 517. Rehoboth: Paulinenhof, *Strey* 2575. Windhoek: *Sittmann* 3; between Haris and Aub, *Pearson* 9601 (BOL).

RHODESIA.—Makoni: Rusape, *Davies* 1075. Matobo: Matopos, *Brain* 3874. Shangani: Gwampa Forest Reserve, *Goldsmith* 151/55.

A. schinzii is easily distinguished by its slightly bulbous base, the usually branched culms and the glaucous-grey colour of the culms and leaves. Because of the long soft hairs on the margins of the joints and pedicels the racemes are villous in appearance.

A characteristic feature of this species is that the upper glumes of the sessile spikelets as well as the lower glumes of the pedicelled spikelets are each provided with a straight awn 5–10 mm long.

13. *A. ravus* *J. G. Anderson* in *Bothalia* 7: 417 (1960). Type: Natal, Bergville, Cathedral Peak, *Killick* 1261 (PRE, holo.).

Perennial, often with a branched system of knotty rhizomes. *Culms* up to 90 cm long, usually 45–60 cm, erect, simple, 2–3-noded, glabrous, faintly striate or smooth. *Leaves* up to 25 cm long, expanded, rarely almost filiform, 2–6 mm wide, linear, tapering to a setaceous apex, narrowed towards the base or base slightly rounded, glabrous, glaucous-grey or green, margins often scabrid; ligule 1.5–2 mm long, membranous, scarios; sheaths glabrous, striate, pallid or upper suffused with purple, shorter than the internodes, leaf-blade of uppermost sheath sometimes reduced to a short awn, mouth often with a few long hairs. *Inflorescence* of 2 (very occasionally 3) spike-like racemes, shortly pedicelled or lowermost sessile. *Racemes* 7–12 cm long, glaucous-grey or green and usually suffused with dull purple; joints and pedicels 6–7 mm long, cuneate-clavate, ciliate on the margins, cilia approximately 4 mm long. *Sessile spikelets* hermaphrodite, linear-oblong; callus broad and obtusely rounded, bearded. *Glumes* subequal; lower 6–9 mm long, dorsally with a deep, narrow or wide median groove, thinly coriaceous; 3-nerved on each side of the groove, sharply keeled upwards, keels narrowly winged, scabrid to ciliate in the upper half, apex mucronate; upper boat-shaped, keel scabrid or ciliate in the upper third, finely ciliate on the margins, 1–3-nerved, apex subacute. *Lower floret* with the lemma 6–8 mm long, 2-keeled with sharply inflexed margins, margins ciliate in the upper half, hyaline, 3-nerved, apex obtuse; palea a nerveless hyaline scale 2–3 mm long. *Upper floret* with the lemma 5–6 mm long, deeply lobed, lobes acute, awned from between the lobes, awn 1.5–2 cm long, twisted below the knee; palea absent. *Pedicelled spikelets* male, dorsally compressed. *Glumes* unequal; lower 7–12 mm long, conspicuously broad, keeled, keels and margins ciliate or with stiff hyaline hairs, apex obtuse or mucronate; upper shallowly boat-shaped, 6–9 mm long, 3 or faintly 5-nerved, margins ciliate, apex acute. *Lower floret* with the lemma 7–8 mm long, margins inflexed, sparsely ciliate in the upper half, hyaline, 3-nerved, apex obtuse; palea a nerveless hyaline scale. *Upper floret* with the lemma 5–6 mm long, margins inflexed, apex obtuse; palea absent; anthers linear, 4–5 mm long.

A. ravus is recorded from mountain slopes near Mbabane in Swaziland and in the foothills of the Drakensberg from Bethlehem in the Orange Free State to Maclear in the eastern Cape Province. It usually occurs in open grassveld at altitudes ranging from 4,700–8,000 feet.

CAPE.—Maclear: Lower Pitsing, *Acocks* 12191.

ORANGE FREE STATE.—Bethlehem: Golden Gate, *Story* 1957.

NATAL.—Bergville: Cathedral Peak, *Edwards* 1935; 1954 (NU); Mont-aux-Sources, *Bayer & McClean* 179; *Edwards* 639; Cleft Peak, towards Indumeni, *Gomell* s.n. Klip River: Van Reenen, *Phillips* 8728.

SWAZILAND.—Mbabane: Ukutula, *Compton* 25593; Forbes Reef, *Codd & Muller* 305.

This species is usually glaucous-grey in colour. It can be confused with *A. amplectens* but is distinguished from that species by the shape of the callus. In *A. ravus* the callus is conspicuously broad and rounded, whereas it is acute or subacute in *A. amplectens*.

A depauperate form of *A. ravus* has been collected near Cleft Peak in the Cathedral Peak area. Except for being smaller in stature with narrow reddish leaves, I can find no difference in spikelet characters. This form is represented by *Gomell* s.n. and *Edwards* 1935 and 1954.

14. *A. filifolius* (Nees) Steud., Syn. Pl. Glum. 1: 374 (1855); Hack. in DC., Monogr. Phan. 6: 453 (1889); Stapf in Fl. Cap. 7: 342 (1898); Chippindall in Gr. & Pastures S. Afr. 1: 497 (1955). Type: Uitenhage, Zuurebergen, northern slopes, *Drege* s.n. (S, lecto!).

Heteropogon filifolius Nees, Fl. Afr. Austr. 102 (1841). Syntypes: Olifantshoek, Boschesman River, *Ecklon* s.n. (SAM!); Uitenhage, Tigerberg, *Ecklon* s.n.; Zuurebergen, *Drege* s.n. (S!).

Perennial, densely tufted. Culms up to 70 cm tall, simple, erect, glabrous, terete, 3-4-noded. Leaves mostly basal; blades up to 30 cm long, filiform, rarely expanded and then 2-5 mm wide, firm, flexuous, glabrous or pubescent on the inside near the ligule, apex acute; ligules coriaceous, 0.5-2 mm long, truncate; sheaths shorter than the internodes, terete, tight, striate, glabrous, lowest persistent, at length breaking up into fibres. Inflorescence of 2 spike-like racemes, one sessile, the other with a glabrous base 7-11 mm long. Racemes 3-10 cm long, straight; joints and pedicels similar, 6-8 mm long, cuneate-linear, attenuated towards the base, rigidly ciliate on the margins, tips crenulate, cupular. Sessile spikelets hermaphrodite, laterally compressed, wedged in between joint and pedicel; callus acute to subacute, shortly bearded. Glumes subequal, subcoriaceous, glabrous; lower 6-8 mm long, linear, keeled, keels rounded, narrow, almost contiguous, narrowly grooved between the keels, apex obtuse, hyaline; upper 6-8 mm long, boat-shaped, glabrous, 1-nerved, apex acute with a bristle 1.3-1.5 mm long. Lower floret reduced to the lemma, 5.5-6 mm long, lanceolate, membranous, hyaline, 1-nerved or nerveless, ciliate on the margins, apex acute. Upper floret with the lemma 4.5-5 mm long, linear, hyaline, 3-nerved, bilobed, lobes oblong, awned from between the lobes, awn 3-5 cm long, stout, kneed at about the middle, pubescent below; palea 2.7-3 mm long, ovate, hyaline, glabrous, nerveless, apex acute; anthers 3-4.5 mm long. Pedicelled spikelets male, lanceolate, dorsally compressed or subterete, glabrous. Glumes unequal; lower 9-20 mm long, flat or rounded on the back, herbaceous, acutely 2-keeled, keels narrowly winged, intercarinal nerves many, apex lobed with a bristle from between the lobes, bristle about 2 mm long; upper 8-14 mm long lanceolate, 3-nerved, ciliate in the upper half or glabrous, apex finely acuminate. Lower floret reduced to the lemma, 8-13 mm long, linear-oblong, 3-4-nerved, ciliate on the margins, apex acuminate. Upper floret with the lemma 7-12 mm long, linear, 1-nerved, glabrous or ciliate on the margins; palea 2-4 mm long, linear, hyaline, nerveless; anthers 5-7 mm long.

A. filifolius is indigenous to Southern Africa and has been recorded from the southern and eastern Cape, Basutoland, Natal, Swaziland and the northern and eastern Transvaal. It grows in sour, open grassland on mountains and hillsides, often in rocky soil.

CAPE.—Albany: Cradock road, *Wells* 2758 (GRA); Grahamstown, *Daly & Sole* 109 (GRA). Komga: near Kei Mouth, *Flanagan* 2348. Matatiele: Melkfontein, *Strey* 537. Mount Ayliff: *Kokstad*, *Goossens* 268. Port Elizabeth: *Van Stadensberg*, *Gillett* 2384 (BOL).

BASUTOLAND.—Butha Buthe: *Moteng*, *Guillarmod* 3842. Leribe: *Dieterlen* 397a.

NATAL.—Bergville: Natal National Park, *Galpin* 10360; Cathedral Peak, *Killick* 949. Durban: Clairmont, *Schlechter* 3092 (GRA). Estcourt: Giants Castle, *Wood* 10546; Griffins Hill, *Acocks* 10633; Ntabamhlope, *West* 470; 917; Mooi River, *Mogg* 3104. Lions River: Balgowan, *Moll* 1205. Mpendle: Tillietudlem, *Huntley* 455. Nkandla: *Codd* 235; Qudeni, *Fisher & Schweickerdt* 30 (NH, NU). Pietermaritzburg: Town Hill, *Fisher* 285 (NU); *Bews* 77 (NU). Utrecht: *Edwards* 630.

SWAZILAND.—Mbabane: Ukutula, *Compton* 24721; 24958.

TRANSVAAL.—Barberton: *Burt Davy* 87; Kaapsche Hoop, *Pole Evans* 1009. Belfast: *Burt Davy* 88. Carolina: near Bossis, *Burt Davy* 86. Ermelo: Maviristad, *Pott* 81. Heidelberg: Vrisgewaagd, *Strey* 3068. Letaba: The Downs, *Junod* 4092; Duiwelskloof, *Scheepers* 966. Pilgrim's Rest: 12½ miles from Graskop on road to Vaalbank, *De Winter & Codd* 221; Graskop, Kowyns Pass, *De Winter & Codd* 153. Waterberg: Krantzberg, *Dyer & Verdoorn* 4242.

This is a variable species in which several "forms" can be distinguished. These forms differ mainly in size, leaf shape and length of the pedicelled spikelets. The most common form occurs in the Drakensberg in the Cape, Basutoland and Natal and is usually a smaller plant of which the leaves are all filiform, the ligules about 0.5 mm long, the racemes 3–6.5 cm long and the pedicelled spikelets 9–12 mm long. A second form is represented by plants with the leaves all filiform or filiform mixed with narrowly expanded leaves, the ligules 0.5–2 mm long, the racemes 6–7 cm long and the pedicelled spikelets up to about 17 mm long. An extremely robust form, represented by *Dyer & Verdoorn* 4242, *Pole Evans* 1009, and *Compton* 24758, collected in the Waterberg, Barberton and Mbabane districts respectively, has leaves which are filiform mixed with leaves up to 5 mm wide, racemes 7–10 cm long and pedicelled spikelets 17–20 mm long.

Except for the variation in size of the various organs, no other noteworthy differences could be found. In contrast to the variability in the length of the pedicelled spikelets, the size of the sessile spikelets remains more or less the same. These forms intergrade and should probably be regarded as ecotypes.

15. *A. schirensis* *Hochst ex A. Rich.* var. *angustifolius* *Stapf* in *Fl. Cap.* 7: 340 (1898), sphalm "angustifolia"; *Fl. Trop. Afr.* 9: 247 (1919); Chippindall in *Gr. & Pastures S. Afr.* 1: 497 (1955). Syntypes: Several. Lectotype: Orange Free State, Thaba Nchu, *Burke* 434 (K, lecto.!; SAM!; PRE, fragment).

A. amplexens *Nees* var. *natalensis* *Hack.* in *Mem. Herb. Boiss.* 20: 9 (1900). Type: Natal, near De Beers, Drakensberg, *Wood* 6002 (NH, iso!).

Perennial, densely tufted. *Culms* up to 120 cm long, erect, slender, glabrous and smooth, terete, simple, rarely branched, 3–4-noded. *Leaves* with the blades up to 35 cm long and 7 mm wide, expanded, linear from a narrow base, long tapering to a fine apex, glaucous or very often reddish, glabrous or often pubescent or scabrid at the base, margins scabrid; ligules 1.5 mm long, membranous, truncate; sheaths terete, smooth, rarely pubescent near the ligule, shorter than the internodes. *Inflorescence* of 2 racemes (rarely 2–5), one sessile, the other with a base about 6 mm long. *Racemes* 5–8 cm long, straight or flexuous, conspicuously dorsiventral exhibiting on the one side the sessile spikelets with the joints and pedicels and on the other side the broad backs of the pedicelled spikelets with the dense cilia of the pedicels between them; joints and pedicels very similar, clavate-cuneate, 4–5 mm long, densely ciliate on both margins, cilia usually shorter in the lower portion, 4–5 mm long towards the apex, tips obliquely cupular or the pedicels produced into a broad tooth. *Sessile spikelets* hermaphrodite, narrowly linear, laterally compressed, glabrous, green to reddish-brown, tightly wedged in between joint and pedicel; callus 1–1.5 mm long, obtuse to subacute, shortly bearded. *Glumes* equal; lower 5–6 mm long, linear-lanceolate, thinly coriaceous, keeled with a narrow, deep hyaline groove between the keels, keels obtuse, smooth below and scaberulous above the middle, 1-nerved in the keels, apex obscurely bifid; upper 5–6 mm long, rounded on the back up to beyond the middle then slightly compressed and keeled, subcoriaceous, 3-nerved with the side

nerves indistinct, margins very narrow, ciliate, apex acute to mucronulate. *Lower floret* reduced to the lemma, 5-5.5 mm long, linear-oblong, membranous, hyaline, 2-nerved, winged, shortly ciliate on the wings, apex subobtuse. *Upper floret* with the lemma 4-5 mm long, linear-oblong, membranous, hyaline, 3-nerved, deeply 2-lobed, lobes acute, lanceolate, ciliolate, awned from between the lobes, awn 2.5-3 cm long, bent and twisted, slender, scaberulous; palea 3.6-4 mm long, ovate-oblong, hyaline, nerveless, apex obtuse; anthers 3.5 mm long. *Pedicelled spikelets* male, 7-8 mm long and 1-2 mm wide, dorsally much compressed, reddish or purplish-brown. *Glumes* more or less equal; lower 7-8 mm long, linear-lanceolate, subherbaceous, 7-15-nerved, keeled, keels acute, scabrid or rigidly ciliolate, apex acute or acuminate; upper 7-8 mm long, membranous, 3-nerved, ciliolate on the margins, apex acuminate. *Lower floret* reduced to the lemma, 7-7.5 mm long, narrowly-oblong, membranous, hyaline, 2-nerved, ciliolate on the margins, apex acute. *Upper floret* with the lemma 6-7 mm long, linear, hyaline, 1-nerved; anthers 5 mm long.

This variety is common in Natal and the northern, eastern and central Transvaal. It also occurs in the Orange Free State, Swaziland, the Barkly West, Kuruman, Mafeking and Vryburg districts of the northern Cape and in South West Africa. Further north it has been recorded from Angola, Rhodesia, Zambia and Malawi.

It grows mainly in open grassland or on hillsides, usually in stony or sandy soil, occasionally in loamy soil on the edge of pans or along riverbanks.

CAPE.—Barkly West: Daniels Kuil, *Esterhuysen* 2044; *Pillans* 2089. Kuruman: 11 miles N.W., *Leistner* 598. Mafeking: near Mosita, *Brueckner* 371. Vryburg: between Vryburg and Tigerkloof, *Brueckner* 1087; Jakkalskop, *Scheepers* 2757.

BASUTOLAND.—Leribe: *Dieterlen* 397b.

ORANGE FREE STATE.—Ficksburg: farm "Aletta", *Matthysen* 11. Kroonstad: Vals River, *Pont* 131. Parys: *Cohen* 101. Winburg: Pretorius Game Reserve, *Van Zinderen Bakker* 1076; 1170.

NATAL.—Bergville: Sentinel Park to Mont-aux-Sources, *Edwards* 639 (NU). Dundee: near Waschbank, *Pentz & Acocks* 10282; near Rorkes Drift, *Edwards* 673. Durban: Berea, *Broad* 104 (NU). Estcourt: Giants Castle, *West* 1618 (NH); *Symons* 15700. Hlabisa: St. Lucia Estuary, *Feely, Tinley & Ward* 3; W. of Charters Creek, *Feely, Tinley & Ward* 7. Kliprivier: Van Reenen, *Schlechter* 6983 (BOL, GRA). Lions River: Mooi River, Rietvlei, *Buchanan* 193; 196; Nottingham Road, *McClellan* 948 (NH). Mpendle: *Clarkson* 156 (NU). Mtunzini: Ngoya Forest Reserve, *Huntley* 641; 644; 815. Newcastle: Road to Utrecht, *Edwards* 624; *Buchanan* 195 (NH). Nkandla: Qudeni Forest Reserve, *Fisher & Schweickerdt* 28 (NH, NU). Pietermaritzburg: Table Mtn., *McClellan* 195; *Bews* 75 (NU); Inchanga, *Most* 92 (NU). Utrecht: Amajuba, *Burt Davy* 154. Vryheid: Hlobani, above Mkusi River, *Johnstone* 387 (NU). Weenen: Farm Schurfdepoort, *West* 1799 (NH).

SWAZILAND.—Mbabane: Ukutula, *Compton* 26696; Forbes Reef road, *Compton* 25742; Forbes Reef, *Meeuse* 10134.

TRANSVAAL.—Barberton: *Thorncroft* 73a. Belfast: Machadodorp, *Williams* 6315; *Pole Evans* H. 16962. Brits: Jacksonstuin, *Mogg* 14277; *Van Vuuren* 457. Carolina: *Van der Schijff* 2605. Ermelo: Bilyys Vlei, *Burt Davy* 78. Heidelberg: Henley-on-Klip, *Stent* s.n. Johannesburg: Houghton, *Cohen* 655. Letaba: Westfalia Estate, *Scheepers* 519; 1236. Lichtenburg: road to Zeerust, *Kinges* 1415. Lydenburg: Mt. Anderson, *Strey* 3036. Marico: *Liebenberg* 5323. Middelburg: *Burt Davy* 152. Nelspruit: Shabin, *Van der Schijff* 1470. Pietersburg: 12 miles E., *Van Vuuren* 1455. Pilgrim's Rest: Mariepskop, *Van der Schijff* 6151; 6 miles N. of Graskop, *Codd* 6450; Iron Crown Mtn., *Meeuse* 9849. Potgietersrus: Moord Drift, *Norlindh & Weimarck* 5241. Pretoria: Meintjies Kop, *Pole Evans* 364; Hoorns Nek, *Codd* 769; Rietvlei Reserve, *Repton* 3227. Vereeniging: *Burt Davy* 17194 (BOL). Waterberg: Sandrivierspoort, *Codd* 921; Towoomba, *Acocks* 8892. Witrivier: Numbi, *Van der Schijff* 1605.

SOUTH WEST AFRICA.—Grootfontein: 30 miles N. of Gautscha Pan, *Story* 6472; Aha Mts., *Story* 6387; between Cigarette and Tsammaigaigai, *Maguire* 2509; Otavi, *Dinter* 5745. Otjiwarongo: Waterberg, *Volk* 1077; Waterberg Plateau, *De Winter* 2791; 2805. Okavango: 8 miles E. of Tamsio, *De Winter & Marais* 4682; 4 miles S.W. of Nzinsi, *De Winter & Wiss* 4008; 5.8 miles E. of Schamvura Camp, *De Winter & Wiss* 4435.

RHODESIA.—Bubi: Gwampa Forest Reserve, *Goldsmith* 19/56. Inyanga: *Norlindh & Weimarck* 4804. Salisbury: *Eyles* 1493; *Brain* 2443.

A. schirensis var. *angustifolius* is characterized by its conspicuously dorsiventral racemes. On the one side the sessile spikelets with the joints and pedicels can be seen, whereas the broad backs of the pedicelled spikelets with the dense cilia of the pedicels between them are evident when viewed from the other side. The whole plant, especially the racemes, is usually flushed with a reddish or purplish-brown colour.

Typical *A. schirensis* apparently does not occur in South Africa although several specimens approach it very closely, in particular those from South West Africa. These include: *De Winter & Marais* 4682, *De Winter & Wiss* 4008, *Maguire* 2509, *Volk* 1077, *Scheepers* 1236, *Van Vuuren* 457 and *Acocks* 8892. These specimens were compared with tropical African material and it was found that the plants are smaller and less robust than in typical *A. schirensis* and that the leaves, although comparatively wide, are shorter.

A definite conclusion can be reached only after a study of a more extensive range of African material has been undertaken.

16. *A. gayanus* Kunth var. *squamulatus* (Hochst. ex A. Rich.) Stapf in Fl. Trop. Afr. 9: 263 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 498 (1955). Type: Abyssinia, Ferrifera Valley, *Schimper* 715 (K, iso.!, PRE, photo.).

A. squamulatus Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 454 (1851); Hochst. in Flora 27: 244 (1844), nom. nud.; Steud., Syn. Pl. Glum. 1: 374 (1855). *A. gayanus* Kunth var. *cordofanus* Hack. in DC., Monogr. Phan. 6: 448 (1889), in part, excl. *Kotschy* 54. *A. helophilus* Schum. in Pflanzenw. Ost-Afr. 5: 98 (1895). Type: Usambara, Hosigo, *Holst* 2535 (K, iso.!). *A. hylophilus* Schum. in Abhandl. Preuss. Akad. Wiss. Berlin 38 (1894), nom. nud.

Perennial, tufted, glaucous. Culms up to 3.5 m long, stout, terete, glabrous, smooth, shiny, many-noded with few to many flowering branches. Leaves glabrous or softly pubescent, rarely villous or tomentose; blades up to 40 cm long and 18 mm wide, glaucescent or ultimately reddish, expanded, linear to lanceolate-linear, the lower portion usually much attenuated and often reduced to the midrib, widening upwards and tapering to a fine apex, midrib prominent, margins scabrid; ligules 2.5–3 mm long, rounded or truncate, scarios, ciliolate; sheaths terete, striate, tight, if wider than the base of the blade then forming more or less rounded shoulders or only very shortly produced into auricles adnate to the ligule. Inflorescence of 2 racemes appearing hairy from the long soft hairs on the joints and pedicels, one sessile, the other with a glabrous base 7–10 mm long; spathes usually with well developed blades except in the uppermost, glabrous. Racemes 6–10 cm long, more or less erect and straight; joints 5–6 mm long, stout, cuneate-clavate, swollen upwards, densely ciliate on both margins, cilia about 4 mm long, apex cupular, dentate; pedicels similar but the cupular apex produced into a tooth on each side. Sessile spikelets hermaphrodite, narrowly-oblong, pale green; callus obtuse, bearded at the base. Glumes equal; lower 7–9 mm long, chartaceous, narrowly-oblong, scabrid or shortly ciliate on the upper half of the keels, dorsally only shallowly grooved, 5–7-nerved on each side of the groove, apex obtuse or minutely bifid; upper 7–9 mm long, boat-shaped, subchartaceous, scabrid on the upper half of the keel, ciliate on the margins, 3-nerved with the midnerve distinct, the lateral shorter and finer, apex obtuse or minutely 3-dentate. Lower floret reduced to a linear-oblong lemma, 7–8 mm long, membranous, hyaline, 2-nerved, margins pilose, apex acute or truncate and ciliolate. Upper floret with the lemma 6–7 mm long, membranous, hyaline, 1-nerved, oblong, 2-lobed, lobes acute, awned from between the lobes, awn 2–2.5 cm long, kneed at about the middle, scaberulous; palea 3.7–4 mm long, oblong, membranous, hyaline, 2-nerved, obtuse or minutely 2-dentate; anthers 4 mm long. Pedicelled spikelets male, linear-oblong,

scaberulous, pale-green. *Glumes* equal; lower 7–9 mm long, chartaceous, linear-oblong, dorsally flattened, keeled, scabrid on the keels, many-nerved, the midnerve distinct and produced into a straight, scaberulous awn 4–6 mm long, apex minutely bifid or acute; upper 7–9 mm long, narrowly-oblong, membranous, 3–5-nerved, margins shortly pilose, apex acute, acuminate or mucronulate. *Lower floret* reduced to the lemma, 7–8 mm long, membranous, hyaline, 2–3-nerved, linear-oblong, margins shortly pilose, apex obtuse or acuminate. *Upper floret* with the lemma 6–7 mm long, membranous, hyaline, 1-nerved, glabrous, apex minutely 2-dentate or mucronate; palea 2.7–3 mm long, more or less oblong, membranous, hyaline, ciliate on the margins, apex obtuse; anthers 4 mm long.

A. gayanus var. *squamulatus* has been recorded from Abyssinia, the Sudan, Nigeria, Ghana, the Congo Republic, Uganda, Tanzania, Zambia, Rhodesia and Mozambique. In South Africa it is confined to the northern parts of Natal and Transvaal, Swaziland, Bechuanaland and northern South West Africa. It usually grows in open grassland in rocky situations and almost invariably in sandy soil.

NATAL.—Hlabisa: W. of Charters Creek, *Ward* 2859; False Bay Park, *Ward* 4151. Ubombo: *Sirey & Huntley* 5011; Mkuzi Game Reserve, *Ward* 3996.

SWAZILAND.—Stegi: Malinda Hills, *Compton* 29790.

TRANSVAAL.—Letaba: Duiwelskloof, *Sheepers* 639; between Komatipoort and Letaba River, *Rogers* 2657. Pietersburg: Leipzig, *Schweickerdt* 1822. Pilgrim's Rest: Orpen Dam, *Van der Schijff* 3473. Sibasa: Punda Milia, *Van der Schijff* 1826; *Acocks* 16765; *Codd* 4212; 5374; *Godfrey* H. 1715. Soutpansberg: 5 miles N. of Louis Trichardt, *Van Vuuren* 1683.

BECHUANALAND.—Francistown, Makarikari Pan, *Pole Evans* 3269; 3303; between Totume and Bushman Mine, *Pole Evans* 3267; Lower Ngwezimba River, *Miller* s.n.; Ngamiland, Tsodito Hills, *Banks* 45.

SOUTH WEST AFRICA.—Grootfontein: Aha Mtns., *Story* 6337; Gemsboklaagte, *Schweickerdt* 2064; Otjihenena, *Volk* V. 68. Otjiwarongo: *Bradfield* 376; Otjiwarongo–Grootfontein Road, *Liebenberg* 4859; Waterberg, *Volk* 423; 999; 1078; *Liebenberg* 4802. Okavango: Andara Mission Stn., *De Winter & Marais* 4827.

ANGOLA.—Huila: *Teixeira* 353; 3459; 3575.

RHODESIA.—Hartley: Makwiro, *Mainwaring* s.n. (Eyles No. 2624). Marandellas: *Eyles* 4015. Matobo: *West* 2158. Salisbury: *Sturgeon* 57588. Shangani: *Goldsmith* 48928.

MOZAMBIQUE.—Cabo Delgado: 5 km from Mocambo da Praia, *Gomes e Sousa* 4693. Lourenco Marques: Manica, *De Lemos & Macuacua* 92. Niassa: Maudimba, *Hornby* 3340.

ZAMBIA.—Chilinga: *Sandwith* 70. Fort Jameson: Senegallia farm, *Grout* 124.

Andropogon gayanus var. *squamulatus* differs from the other South African species of *Andropogon* in being more robust with broader leaves. Like *A. schinzii* the culms are usually branched, producing few to many flowering branches. Three well defined varieties of *A. gayanus* are upheld by Stapf in the Flora of Tropical Africa (1919), of which only the var. *squamulatus* is known to occur in South Africa. This variety differs from typical *A. gayanus* in that the pedicelled spikelets are scaberulous with the joints and pedicels ciliate on both margins.

17. *A. distachyos* L., Sp. Pl. 1046 (1753); Steud., Syn. Pl. Glum. 1: 372 (1855); Hack. in DC., Monogr. Phan. 6: 461 (1889); Stapf in Fl. Cap. 7: 343 (1898); Fl. Trop. Afr. 9: 218 (1919); Chippindall in Gr. & Pastures S. Afr. 1: 496 (1955). Type: Europe, Helvetia, Linn. Herb. 1211.10 (PRE, photo.).

Perennial, caespitose with a short oblique rhizome. *Culms* up to 120 cm long, erect, slender, terete, simple or branched towards the base, glabrous, 3–7-noded, lower nodes often hairy, basal internodes usually naked. *Leaves* 5–30 cm long, 1–4 mm, rarely 5 mm wide, expanded, linear, tapering to a long and sometimes setaceous apex, rigid to flaccid, hairy or glabrous but usually with pubescent basal shoots, often glabrescent, more or less rough above and scabrid on the margins; ligules 2 mm long, membranous with a fimbriate rim, truncate, sometimes pilose from behind; sheaths glabrous

or the lower hairy. *Inflorescence* of 2, rarely 3 racemes, the one sessile, the other shortly peduncled, rather robust, straight or curved, greenish, often tinged with a dull or livid purple, 5–10 cm long; joints cuneate-linear, hollow and very slightly inflated, 3·5–4 mm long, semi-transparent along the middle, glabrous to subpubescent on the back, ciliate on the outer margin, cilia 1–2 mm long, tips slightly cupular; pedicels similar, slightly longer and more translucent. *Sessile spikelets* hermaphrodite, 9–12 mm long, broad-lanceolate to acuminate, pale-green, often purplish towards the apex; callus short, obtuse, shortly bearded. *Glumes* unequal; lower subherbaceous or chartaceous, dorsally flattened, glabrous or puberulous, keels broadly winged, wings membranous, whitish or purplish, intracarinal nerves 7–11, partly evanescent below; upper distinctly shorter than the lower, boat-shaped, rigidly membranous, 3-nerved, softly ciliate, tips minutely 2-dentate with a bristle 4–6 mm long. *Lower floret* reduced to the lemma, 5–7 mm long, oblong, acute or subacute, 2-nerved. *Upper floret* with the lemma 5–7 mm long, slightly gibbous on the back, 2-lobed to below the middle, chartaceous and 3-nerved below, lobes lanceolate, glabrous, awned from between the lobes, awn slender, about 2·5 cm long, kneeed at and twisted below the middle; palea minute or absent; anthers 3 mm long; grain oblong, 2 mm long. *Pedicelled spikelets* similar to the sessile but narrower. *Glumes* unequal, lower 9–11 mm long, subherbaceous to chartaceous, very narrowly winged and terminated by a bristle 4–6 mm long; upper membranous, 3-nerved, shortly aristulate. *Lower floret* with the lemma 5–7 mm long, delicately hyaline, ciliolate, faintly 2-nerved. *Upper floret* with the lemma 4–5 mm long, delicately hyaline, glabrous, 1-nerved, apex slightly notched.

This species occurs in southern Europe, throughout the Mediterranean region, tropical Africa and southern Arabia. In South Africa it has been recorded from mountain slopes in the Drakensberg areas of Natal, the Orange Free State and the northern Transvaal. It usually grows in rocky situations in open grassland, often preferring wet places.

ORANGE FREE STATE.—Harrismith: Wittebergen, *Buchanan* 263 (BOL). Vrede: Quagga Kop, *Acocks* 12757.

NATAL.—Bergville: Cathedral Peak, *Chippindall* 355. Estcourt: Cathkin Peak, *Edwards* 2006; Mountain hostel, *West* 145; Ntabamhlope, *Acocks* 11460; 11480. Kliprivier: Collings Pass, *Acocks* 13487. Underberg: *McClellan* 601.

TRANSVAAL.—Pilgrim's Rest: Mariepskop, *Van der Schijff* 5583.

Linnaeus originally described this species as *A. distachyon*. The generic name *Andropogon* is, however, masculine and, if Recommendation 75A of the International Code of Botanical Nomenclature (1961) is taken into consideration, the specific name should be changed to *distachyos*.

A. distachyos is readily distinguished from the other South African species by the broadly winged lower glumes of the sessile spikelets. I have not seen type material of this species but the South African material was carefully compared with the description of the species. Furthermore, *Chippindall* 355 was compared with European specimens at Kew by Dr. B. de Winter who states that it compares well except that the South African specimen is slightly larger. I have no doubt that the South African material is indeed *A. distachyos* L.

Bews s.n., collected at Himeville in the Underberg district, proved to be of interest. This specimen, deposited in the herbarium of the Natal University (NU 3539), is vegetatively similar to *A. schirensis* var. *angustifolius*. Even the colouring of the leaves and racemes is typically reddish-brown. Examination of the spikelets revealed, however, that the lower glumes of the sessile spikelets are dorsally flattened and broadly winged as in *A. distachyos*. Except for minor details the spikelets are typical of this species. As both *A. schirensis* var. *angustifolius* and *A. distachyos* occur in this area, this specimen is most probably a hybrid between these two species.