

AN ACCOUNT OF THE SOUTH AFRICAN MATERIAL OF *ARISTIDA* LINN. IN CERTAIN EUROPEAN AND SOUTH AFRICAN HERBARIA.

By

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Scope of the Present Paper.

Until the time of publication of Henrard's classical Revision and Monograph of the genus *Aristida* L., great difficulty was experienced in naming critically any South African material of this genus. As Henrard was in a position to examine only a limited number of South African specimens owing to the great amount of time which the examination of such a large genus necessarily involved, the author of the present paper undertook to align and name up critically all the material in the South African Herbaria. He, furthermore, extended his original intention and later on included the South African material deposited in most of the Herbaria enumerated below. In the course of these investigations several difficulties were encountered. Several doubtful points however have also been settled. Where necessary and desirable the specific descriptions as given by Henrard have been modified to include the very wide range of material (about 6,000 sheets) studied. The sequence of the enumerated species is not strictly according to the plan as adopted by Henrard; his work, however, has formed a basis which the present author has merely attempted to enlarge upon.

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Herbaria Consulted.

The various Herbaria in which the numerous specimens cited are deposited, have been indicated by the bracketed abbreviations following such specimens. These indices refer to the respective Herbaria enumerated below.

- A..... Albany Museum, Grahamstown.
- B..... Botanisches Museum, Berlin-Dahlem.
- BH..... Bolus Herbarium, Cape Town.
- BM..... British Museum (Natural History), London.
- D..... Natal Herbarium, Durban.
- G..... Conservatoire Botanique, Geneve.
- GU..... Grey University College, Bloemfontein.
- K..... Royal Botanic Gardens, Kew.
- L..... Rijksherbarium, Leiden.

LG.....	Herb. Trinius, Leningrad.
Mc.....	McGregor Museum, Kimberley.
N.....	National Herbarium, Pretoria.
O.....	Fielding Herbarium, Oxford.
P.....	Museum National d'Histoire Naturelle, Paris.
S.....	South African Museum, Capetown.
Sreg.....	Regional Herbarium, University, Stellenbosch.
St.....	University of Stellenbosch.
T.....	Transvaal Museum, Pretoria.
U.....	University of Cape Town.
V.....	Naturhistorisches Museum, Wien.
W.....	U.S. National Herbarium, Smiths. Inst., Washington.
WR.....	University of Witwatersrand, Johannesburg.
Z.....	Botanisches Museum, Zürich.

In addition to the above, the following abbreviations are used throughout:—

Henrard Crit. Rev... A Critical Revision of the Genus *Aristida* by J. Th. Henrard in Mededeelingen van 's Rijksherbarium Leiden Nos. 54 (1926), 54A (1927), 54B (1928), 54C (1933).

Henrard Monogr..... A Monograph of the Genus *Aristida* by J. Th. Henrard in Mededeelingen van 's Rijksherbarium Leiden Nos. 58 (1929), 58A (1932), 58B (1933).

The Subdivisions of the Genus.

Henrard's brilliant Revision and Monograph of the genus has shown that the species readily fall into seven sections. The species of any one particular section form with but a few exceptions, a fairly homogeneous group. These sections are based solely on organographic characters of the inflorescence, i.e. the spikelet. So far the existing sections of the genus have proved to be quite adequate.

Theron in Fedde, Rep. 40. I. ff. (1936) has published the results of an anatomical study of the leaves of many South African species of *Aristida*. He has drawn up four anatomical groups and cites the species constituting these groups. His first group consists of species typical of § *Stipagrostis* and § *Schistachne*. The second group consists of species belonging to §§ *Stipagrostis*, *Chaetaria* and *Arthratherum*. The third group is formed by elements belonging to §§ *Stipagrostis*, *Arthratherum*, *Chaetaria* and *Pseudarthratherum*. The fourth group consists of members belonging to the § *Stipagrostis*.

All the anatomical groups except the fourth are thus composed of elements taken from two or more organographic sections and thus if considered from an organographic point of view these groups are extremely heterogeneous in constitution. If the leaf anatomy leads one to place together in one group such diverse elements as *A. geminifolia*, *A. bipartita*, *A. barbicollis* and *A. spectabilis*, all of which are organographically very distinct from each other, a classification based on leaf anatomy is highly artificial and shows no advantages over a natural classification based solely on organographic characters. Theron's fourth anatomical group consisting of *A. lanipes*, *A. gonatostachys*, *A. subacaulis* and *A. Hermannii* is the only one acceptable since its constituents form a fairly homogeneous unit both from an anatomical and organographic point of view. It is interesting to note that the anatomical structure of the leaves in *A. capensis* and *A. sericans* bear very great resemblance to each other. These species organographically likewise show a great deal of convergence. The recently described *A. capensis* Thunb. var. *Dieterleniana* mihi superficially resembles *A. sericans* Hack. so closely that these plants could readily be confused. Theron's argument

that an anatomical key to the **species** (South African) of *Aristida* is of economic importance is justified up to a degree. It is only after one is able to distinguish the various S. African **genera** of Gramineae solely on basis of their vegetative characters that the results of Theron's researches will fully be made use of.

Key to the Sections and the South African Species.

1. Central awn, or central and both lateral awns of the lemma distinctly plumose..... 2
Central awn, or central and lateral awns never plumose.... 3
 2. Body of the lemma with an articulation situated at or just above its middle; at maturity the awns and column break off together with the conical hollow upper part of the lemma..... I. § **Schistachne.**
Body of the lemma not articulated at or slightly above its middle, but moreover the column of the awns is articulated at its point of insertion near or at the apex of the lemma; column together with the awns disarticulating upon maturity without a part of the lemma..... II. § **Stipagrostis.**
Body of the lemma, column and awns show no signs of an articulation..... III. § **Chaetaria.**
 3. Body of the lemma, column and awns show no signs of an articulation; column present or totally wanting; callus never bifid..... III. § **Chaetaria.**
An articulation is present, very rarely absent, but if so then callus always bifid..... 4
 4. The articulation is situated at the summit of the column just below the branching point of the awns; column usually well developed; callus never bifid..... IV. § **Pseudarthratherum.**
The articulation is situated between the summit of the lemma and the foot of the column; if the column is absent then the callus is distinctly bifid or rounded..... 5
 5. Callus bifid, emarginate, truncate or long-acute; column of awns usually well-developed; if absent, then the callus distinctly bifid. The articulation is situated between the apex of the lemma and the foot of the column..... V. § **Arthratherum.**
Callus rounded; column is totally wanting, the articulation is situated between the lemma and the branching-point of the awns; margins of the lemma involute..... VI. § **Pseudochaetaria.**
- I. § Schistachne (Fig. et Denot.) Henr.**
1. Panicle very dense and spikelike; spikelets nearly sessile; position of the glumes usually inverse, the lower usually distinctly longer than the upper..... 2
Panicle not dense and spikelike, but loose, or more or less contracted; spikelets pedicelled; position of the glumes not inverse, the lower shorter or much shorter than the upper..... 3
 2. Lower glume long hairy..... *Hochstetteriana* (1).
Lower glume never hairy..... *secalina* (2).

3. All the awns of the lemma plumose, usually equally strongly so, or the lateral awns not as densely plumose as the central awn..... 4
 Only the central awn of the lemma plumose and densely feathery upwards, the lateral awns never plumose..... 7
4. Internodes woolly or pubescent just below the nodes; panicle-branches woolly-pubescent..... *proxima* (3).
 Internodes glabrous or scaberulous but never woolly-pubescent; panicle-branches scabrous or glabrous..... 5
5. Suffrutescent and rigid perennial; innovations and branches fascicled; culms 4-5-noded; nodes perfectly glabrous.. *namaquensis* (4).
 Caespitose perennial; culms never branched; nodes conspicuously bearded with a ring of spreading white hairs.. 6
6. Glumes acutish, 14-16 mm. long, plumose awns obtuse in outline..... *Schlechteri* (5).
 Glumes obtuse, about 10 mm. long, plumose awns acute in outline with naked exerted tips..... *hybrida naturalis* (6).
7. Glumes of a very firm texture, cartilaginous, glabrous or rigidly ciliate, subequal, linear-oblong, obtuse, with emarginate and slightly ciliolate tips..... 8
 Glumes thin, hyaline or papery in texture, glabrous or softly hairy, unequal, lanceolate, acuminate..... 13
8. Nodes conspicuously bearded with a ring of spreading white hairs..... 9
 Nodes perfectly glabrous and smooth..... 12
9. Leaf-sheaths and leaf-blades of culm and innovations densely lanate or villous..... *ciliata* Desf. var. *villosa* (7a).
 Leaf-sheaths and leaf-blades of culm and innovations never woolly or villous, sometimes slightly hairy on the margin 10
10. Glumes glabrous, not ciliate with spreading hyaline hairs.. *ciliata* Desf. var. *capensis* (7).
 Glumes or at least the upper glume ciliate with spreading hyaline hairs..... 11
11. Both glumes ciliate with spreading hyaline hairs..... *ciliata* Desf. var. *pectinata* (7b).
 Only the upper glume with spreading hyaline hairs..... *ciliata* Desf. var. *tricholaena* (7c).
12. Glumes 8.5-12.5 mm. long, usually glabrous, rarely both rigidly ciliate..... *Schaeferi* (8).
 Glumes 8-9 mm. long, only the upper ciliate with rigid long hyaline hairs..... *Schaeferi* Mez var. *biseriata* (8a).
13. Panicle erect, linear, very narrow and contracted, but somewhat interrupted near the base; glumes 12-16 mm. long *Dinteri* (9).
 Panicle open, rather loose; glumes 6-8 mm. long..... 14

14. Glumes covered with soft spreading hairs..... *prodigiosa* (10).
 Glumes quite glabrous..... *prodigiosa* Welw. var.
calva (10a).

II. § *Stipagrostis* (Nees) Trin. et Rupr.

1. All the awns plumose with long spreading hairs, or the lateral awns at times very scantily plumose (almost naked).. 2
 Only the central awn plumose with long spreading hairs, the lateral awns quite naked or very rarely scantily adpressedly ciliate-pubescent..... 11
2. Column of awns well developed (1.5–12 mm. long) and more or less twisted..... 3
 Column of awns wanting, or sometimes only very short or minute, not twisted into a beak..... 8
3. Nodes glabrous; tip of the central awn always very acute in outline..... 4
 Nodes distinctly bearded with a ring of hyaline spreading white hairs; central awn plumose to the very tip, obtuse in outline..... *Schlechteri* (5).
4. Column of awns quite glabrous..... 5
 Column of awns distinctly hairy..... 6
5. Column of awns much exceeding the glumes; feathers of awns usually bright yellow..... *capensis* Thunb. var.
macropus (11b).
 Column of awns shorter than or slightly exceeding (by 1–2 mm.) the glumes, feathers of awns white or canescent... *capensis* Thunb. var.
genuina (11a).
6. Glumes glabrous..... 7
 Glumes distinctly softly hairy..... *capensis* Thunb. var.
Dieterleniana (11c).
7. Panicle usually overtopped by the leaves; glumes subequal; column of awns up to 4 mm. long..... *capensis* Thunb. var.
barbata (11d).
 Panicle not overtopped by the leaves; glumes slightly unequal; column of awns 6–12 mm. long..... *capensis* Thunb. var.
canescens (11e).
8. Lower glume exceeding the upper in length; axils of the panicle-branches glabrous..... *damarensis* (12).
 Lower glume shorter than the upper; axils of the panicle-branches glabrous or bearded..... 9
9. Panicle dense and spike-like; axils of the panicle-branches glabrous; the branching-point of the awn produced into two thin, hairy appendages; awns about equal, up to 10 mm. long, equally strongly plumose..... *sabulicola* (13).
 Panicle effuse, pyramidal; the branching-point of the awns not produced into appendages; awns unequal, the central awn densely plumose, the lateral awns almost naked (at most very scantily plumose)..... 10

10. Axils of the panicle-branches distinctly bearded ; central awn obtuse in outline..... *Marlothii* (14).
 Axils of the panicle-branches quite glabrous ; central awn subacute in outline..... *lutescens* (15).
11. Dwarf annuals, not exceeding 10 cm. in height ; inflorescences much congested and almost spike-like..... 12
 Perennial species, or if annual then taller than 10 cm..... 13
12. Plants compactly caespitose with the inflorescences almost hidden among the leaf-blades ; branching-point of the awns not conspicuously hairy..... *subacaulis* (16).
 Plants more diffuse with the culms geniculately ascending ; lower nodes usually well-exserted ; branching-point of the awns conspicuously hairy..... *Hermannii* (17).
13. Glumes hirsute or pilose over their whole surface, sometimes glabrous only at the tips..... 14
 Glumes glabrous and smooth over their whole surface, rarely with a few marginal hairs, or scaberulous on their whole surface..... 18
14. Column of the awns glabrous below their branching-point or without a pencil of hairs at their branching-point ; central awn obtuse in outline, plumose to the very tip ; panicles short, spike-like, congested, often sheathed by the uppermost leaf..... 15
 Column of the awns hairy below their branching-point, or with a pencil of hairs at their branching-point ; central awn with a naked exserted tip ; glumes shortly hairy or pubescent..... 16
15. Culms with very unequal internodes, short near the base, longer upwards and short again towards the top ; leaf-blades of culm-sheaths not well-developed..... *geminifolia* (18).
 Culms with very nearly equal internodes ; leaf-blades of culm-sheaths well-developed..... *fastigiata* (19).
16. Annual plants ; lower glume up to 6 mm. long, the upper up to 10 mm. long..... *hirtigluma* (20).
 Erect perennial plants ; lower glume \pm 10 mm. long, the upper \pm 13 mm. long..... 17
17. Central awn equally plumose from the base to very near the tip..... *gracilior* (21)
 Central awn naked below, with a pencil of hairs at the branching-point of the awns..... *gracilior* Pilger var. *intermedia* (21a).
 Central awn naked in the lower part, not bearded at the branching-point of the awns..... *gracilior* Pilger var. *Pearsonii* (21b).
18. Lower glume exceeding the upper in length ; lower glume with many longitudinal rows of minute scabrous hairs on the outer surface..... *obtusa* (22).
 Lower glume shorter than the upper ; lower glume not conspicuously minutely scaberulous..... 19

19. Vegetative parts covered with tubercular prominent glands ;
suffrutescent rigid perennial..... *brevifolia* (23).
Vegetative parts devoid of tubercular glands ; suffrutescent
or caespitose perennials, rarely annuals..... 20
20. Column with a pencil of hairs at the branching-point of the
awns..... 21
Column without a pencil of hairs at the branching-point of
the awns..... 23
21. Central awn naked at least in its lower third..... *uniplumis* (24).
Central awn plumose to the base..... 22
22. Glumes about 14 mm. long ; central awn somewhat rigid and
bristle-like..... *uniplumis* Licht. var.
Neesii (24a).
Glumes 8-10 mm. long ; central awn not as above..... *uniplumis* Licht. var.
Pearsonii (24b).
23. Sheaths of the innovations densely white woolly or at least
the margins villous ; dwarf caespitose plants..... 24
Sheaths of the innovations never densely white-woolly ;
plants usually from a suffrutescent much-branched base 25
24. Leaves long-hairy between the longitudinal ridges. Axis of
inflorescence scaberulous. Nodes and apices of pedicels
hairy..... *gonatostachys* (25).
Leaves glabrous. Axis of inflorescence glabrous. Nodes
and apices of pedicels not long-hairy..... *lanipes* (26).
25. Axils of panicle-branches with conspicuous pencils of hairs
Axils of panicle-branches glabrous..... *Marlothii* (14).
26
26. Central awn plumose, acute in outline ; glumes glabrous,
unequal..... 27
Central awn plumose, obtuse in outline ; glumes subequal,
usually purple, the lower in the young state dorsally often
somewhat shortly hairy, scaberulous on the keel upwards
Dreyeana (27).
27. Column 8-10 mm. long..... *garubensis* (28).
Column 2-5 mm. long..... *lutescens* (15).

III. § *Chaetaria* (Beauv.) Trin.

1. Awns and column of the lemma densely plumose and hairy
as in § *Stipagrostis*..... 2
Awns and column of the lemma never plumose or hairy, at
most scabrid or glabrous only..... 3
2. Glumes densely villous ; nodes perfectly glabrous..... *sericans* (29).
Glumes quite glabrous ; nodes with a ring of long spreading
white hairs..... *hybrida naturalis* (6).
3. Internodes covered with a fugacious adpressed wool below
the nodes, or lanate-woolly all over, sometimes the lower
internodes only woolly or pubescent-lanate and the upper
glabrous..... *Sciurus* (30).
Internodes glabrous or scabrous, rarely with some short hairs
below the nodes..... 4

4. Panicles dense and spike-like or laxly contracted and more or less interrupted..... 8
 Panicles effuse and open, with the branches remote and divaricate..... 5
5. Position of the glumes inverse, the lower glume exceeding the upper in length..... *bipartita* (31).
 Position of the glumes not inverse, but subequal or the lower much shorter than the upper..... 6
6. Annual plants, often somewhat delicate..... 7
 Perennial plants, usually somewhat robust; the lemma shorter than or as long as the glumes; the tips of the glumes reaching up to or surpassing the branching-point of the awns..... *canescens* (34)
7. Glumes very acute, prominently awned, exceeding the lemmas..... *scabrivalvis* (32).
 Glumes acute or obtuse, not awned, or the upper glume at most bifid with a mucro from the sinus; lemmas as long as or longer than the glumes..... *effusa* (33).
8. Column well-developed, very variable in length, distinctly twisted..... 9
 Column wanting or lemma is produced into a short scarcely-twisted beak..... 12
9. Lower glume exceeding the upper in length, position of glumes "inverse"..... *monticola* (35).
 Lower glume always shorter than the upper..... 10
10. Glumes unequal, the lower about $\frac{1}{2}$ to $\frac{2}{3}$ as long as the upper; internodes distinctly compressed..... *junciformis* (36).
 Glumes about equal or slightly unequal, the upper only 1-1.5 mm. longer than the lower; internodes not compressed..... 11
11. Spikelets small; glumes shorter than 10 mm.; lateral awns almost absent or at least much more weakly developed than the central awn; culms usually much-branched from the nodes..... *transvaalensis* (37).
 Spikelets larger; glumes about 10 mm. long or longer, the lower frequently slightly recurved from the apex and either smooth, scaberulous to minutely hairy especially towards the tip; culms rarely branched from the nodes..... *aequiglumis* (38).
12. Lower glume exceeding the upper in length..... 13
 Lower glume always shorter than the upper..... 14
13. Lemmas with longitudinal rows of spiny hairs..... *rhiniochloa* (39).
 Lemmas smooth, the midrib scabrous only..... *andoniensis* (40).
14. Panicles very dense and spike-like, obovate in outline, up to 6 cm. long; body of lemma very scabrous with longitudinal rows of spiny hairs and furrowed ventrally..... *Hubbardiana* (41).
 Panicles not densely spike-like; body of lemma not very scabrous and not furrowed ventrally..... 15

15. Perennial plants..... 16
 Annual plants..... 19
16. Glumes very unequal, the lower about half the length of the upper; spikelets usually small and dark purple..... *recta* (42).
 Glumes equal or unequal, the lower more than two-thirds as long as the upper..... 17
17. Culms markedly compressed below the nodes especially towards the base..... *junciformis* (36).
 Culms terete..... 18
18. Culms 1-noded; blades very narrow, setaceous; panicles short, about 2-2.5 cm. long, lax..... *Galpinii* (43).
 Culms more-noded; blades flat; panicles not short, usually long or very long..... *canescens* (34).
19. Glumes very obtuse and rather broad, both erosebifid and with a mucro from the sinus..... *curvata* (44).
 Glumes acute or subacute and minutely awned, at least the lower, the upper commonly obtuse and bifid, with a mucro from the sinus..... 20
20. Awns of the lemma triquetrous above, very flat over a long distance, with a pronounced midnerve and hyaline rather broadly winged margins; panicle erect and rather compact and spike-like, now and again somewhat interrupted... *submucronata* (45).
 Awns of the lemma terete or mostly subtriquetrous, sometimes slightly winged only at the very base, without broad hyaline margins; panicle somewhat lax at times even flexuous, not very dense and spikelike..... *adscensionis* L. subsp. *guineënsis* (46).

IV. § *Pseudarthratherum* Chiov.

1. Panicles lax and open or composed of more or less peduncled false spikes, sometimes loosely contracted, the long branches erect and appressed, but always naked below and never dense and spike-like..... *barbicollis* (47).
 Panicles densely contracted, spike-like, the branches very short, spikelet-bearing from the base, sometimes interrupted or with 1-2 peduncled additional false spikes at the base, rarely not dense and spike-like, but narrowly linear and more or less interrupted, with flexuous subsecund branches nearly always spikelet-bearing from the base..... 2
2. Lemma granular, densely tubercled in its upper part, quite smooth only in its lower quarter-part..... *alopescuroides* (48).
 Lemma smooth, or scabrous only under a strong lens, never densely tubercled..... 3
3. Panicles contracted and much-branched, the branches erect or slightly spreading, never spike-like, glumes not very unequal, panicle up to 20 cm. long..... *Pilgeri* (49).
 Panicles spike-like, densely contracted, if branched or interrupted at the base, then branches usually spreading, glumes unequal..... 4

4. Rigid perennials, inflorescence up to 20 cm. long..... *longicauda* (50).
 Annual or perennial, inflorescence rarely up to 15 cm. long,
 the whole plant usually not exceeding 60 cm. in height.. *congesta* (51).

V. § *Arthratherum* (Beauv.) Reichb.

1. Callus bifid or more rarely almost truncate, rounded or slightly emarginate..... 2
 Callus conical, long acute, never bifid..... 10
2. Glumes equal or nearly so..... *spectabilis* (52)
 Glumes very unequal..... 3
3. Foot of awns more than 2 cm. long, usually 2.5-3 cm. long *stipoides* (53).
 Foot of awns shorter than 2 cm., usually only about 1 cm. long..... 4
4. Ligule a more or less woolly fringe, or a dense line of long soft hairs surrounding the mouth of the sheaths like a flake of wool; if flake of wool absent then the lowermost internodes densely lanate..... 5
 Ligule a line of very short hairs, no flake of wool present.. 6
5. Lower internodes densely woolly, the upper glabrous; column of awns rather short, about 6.5 mm. long..... *vestita* (54).
 Lower and other internodes glabrous; column of awns usually rather long, up to 15 mm. long..... *meridionalis* (55).
6. Culms usually fascicled from a much-branched base and lower nodes..... 7
 Culms never fascicled but usually one- to several-noded.. 8
7. Callus truncate, obliquely truncate, rounded or even slightly emarginate; lemma dorsally glabrous, very rarely minutely scaberulous..... *dasydesmis* (56).
 Callus distinctly bifid; lemma dorsally distinctly scaberulous *Engleri* (57).
8. Culms several-noded; lower glume \pm 6 mm. long, the upper \pm 12 mm. long..... *diffusa* Trin. var. *Burkei* (58a).
 Culms 1-2-noded; lower glume \pm 8-9 mm. long, the upper \pm 15-18 mm. long, if both shorter then the column very short or almost absent..... 9
9. Column very short or absent..... *diffusa* Trin. var. *pseudohystrix* (58b).
 Column well developed \pm 7 mm. long..... *diffusa* Trin. var. *genuina* (58).
10. Internodes densely woolly or lanate-tomentose..... *mollissima* (59).
 Internodes quite glabrous or minutely scaberulous only, never pubescent..... 11

11. Inflorescence dense, more or less elongate and spike-like ;
column of awns more than 3.5 cm. long..... *stipitata* (60).
Inflorescence fairly lax, never dense and spike-like ; column
of awns about 2 cm. long or somewhat longer..... *graciliflora* (61).

VI. § *Pseudochaetaria* Henr.

- Only South African species..... *hordeacea* (62).

ENUMERATION OF THE SPECIES.

1. **A. Hochstetteriana** *Beck ex Hack.* in Verh. Bot. Ver. Prov. Brandenb. **30.** 144 (1888) ; Dur. et Schinz, *Consp.* **5.** 803 (1894) ; Hack. in Bull. Herb. Boiss. **4.** Append. iii. 18 (1896) ; Stapf in Dyer, *Fl. Cap.* **7.** 571 (1899) ; Bolus in Ann. S. Afr. Mus. **9.** iv. 234 (1915) pro parte ; Dinter in Fedde, *Rep.* **15.** 342 (1918) ; Garabedian in Ann. S. Afr. Mus. **16.** ii. 402 (1925) pro parte ; Henrard *Crit. Rev.* **2.** 234 (1927) ; Henrard *Monogr.* **1.** 37 cum ic. tab. 1 (1929) ; Range in Fedde, *Rep.* **33.** 9 (1933).

Perennial, densely caespitose, branched from near the base, forming dense tufts. *Culms* simple, up to about 50 cm. high, erect or somewhat geniculately ascending, 2-4-noded ; internodes terete, substrate, minutely scaberulous or glabrous ; nodes glabrous, often swollen, exserted. Lower *leaf-sheaths* reduced and scale-like, with very short blades, striate, scaberulous, often more or less woolly at the base ; upper leaf-sheaths tight, striate, scaberulous or with scattered long tubercle-based hairs, shorter than the internodes ; *ligule* a short ciliate rim ; auricles shortly ciliate more rarely long-bearded ; collar smooth ; *blades* convolute or setaceous, those of the innovations up to 14 cm. long, the culm-blades up to 25 cm. long, ending in a setaceous point, glabrous or with scattered long tubercle-based hairs beneath, hirtellous on the upper surface, striate. *Panicle* excluding the awns up to 9 cm. long, usually much shorter, dense, spike-like, up to 1 cm. broad ; axis scaberulous, the lowermost axils of the branches sometimes with a tuft of hairs ; branches solitary, divided nearly from the base ; branchlets very short, scabrous ; pedicels scabrous, about 1-2 mm. long, clavate. *Spikelets* congested, yellowish or greenish. *Glumes* narrowly linear or lanceolate, acuminate, 3-nerved with a stronger midnerve ; the lower glume very scabrous and with long spreading hairs especially dorsally, 13-18 mm. long, *not always exceeding the upper glume in length* ; the upper glume about 12-17 mm. long, glabrous or scaberulous only. *Lemma* spindle-shaped, together with the callus and up to the articulation 5-7 mm. long, below the articulation densely punctulate-scabrous, above the articulation smooth, from the articulation to the branching-point of the awns 8-10 mm. long ; column slightly scaberulous, twisted ; central awn plumose and long-feathery above the middle, the feathery part obtuse in outline, naked in lower quarter, with a naked excurrent tip, 5.5-7.5 cm. long ; lateral awns fine, scaberulous or smooth, 2.2-2.4 cm. long. *Callus* very acute, adpressedly hairy below, long-hairy above, 2.0-2.5 mm. long. *Anthers* 6.0-7.0 mm. long.

SOUTH-WEST AFRICA.

Onguati, lichte Buschsteppe, IV. 1913, *Engler* 6187 (B, K) ; Spitzkopje, V. 1936, *Boss* TM 36138 pro parte (T) ; Spitzkopje, I. 1937, *Boss* TM 36359 and 36378 (T) ; Usakos, V. 1936, *Wilson* NH 21388 (N) ; do., XII. 1938, *Volk* 133 (D) ; Aukas, V. 1930, *Bradfield* 571 (N) ; Kubas-Habis, IV. 1913, *Dinter* 2820 (B) ; Kubas-Ababis, IV. 1913, *Engler* 6134 (B) ; Haikamchab, I. 1907, *Galpin et Pearson* 7594 (K, N, V) ; Otjimbingue, 1897, *Fischer* 68 (B) ; Walfish Bay, 100 KM east of, *Wyley* s.n. (V) ; Quartel near Rehoboth, IV. 1911, *Dinter* 2172 (B) ; along the Gamgam River, III. 1905, *Von Trotha* 15a (B) ; Gamkamas, III. 1911, *Dinter* 1990 (B, W) ; Gelwater near Gibeon, IV. 1912, *Range* 1328 (B, W) ; Kammachas, *Range* 1415 (B) ; Mount Brukkaros, IV. 1927, *Sordahl* 37 (BM, W)

et *Sordahl* 38 pro parte (BM); Am Löwenfluss bei Gawachab, II. 1910, *Schäfer* 444 (B); 12 KM west of Sandverhaar, II. 1909, *Pearson* 4605 (K); Inachab, Sandrivier, *Dinter* 1107 (B, Z); Haobes (Hoabes?), *Dinter* 1473 (B); without precise locality, *Pearson* 7798 (BH, K) and *Lüderitz* 66 (B, Z).

TYPE SPECIMEN.

The type-gathering (*Wyley* s.n.) consists of 7 sheets deposited in the Naturhistorisches Museum, Wien. Beck's manuscript description and dissections are still attached to one of the sheets, and this has consequently been selected by Henrard (*Crit. Rev.* 235) as the type.

ECONOMIC NOTES.

This species is considered an especially valuable grass. Several collectors state in their field notes that it is much relished by stock.

2. *A. secalina* *Henrard* *Crit. Rev.* 3, 552 (1928); *Henrard Monogr.* 1, 36 cum ic. tab. 1 (1929).

A. Hochstetteriana Beck ex Hack. sec. Garabedian in *Ann. S. Afr. Mus.* 16, ii. 402 (1925) pro parte, non Beck ex Hack. *Aristida* nov. spec. ex aff. *A. hordeaceae* sec. Hack. in *Bull. Herb. Boiss.* 4 Append. iii. 20 (1896).

Since this species is very closely related to *A. Hochstetteriana* and may only be distinguished from this in having a glabrous lower glume, it was thought superfluous to draw up a separate description. The description of *A. Hochstetteriana* thus covers the following specimens except for the point of difference mentioned above.

SOUTH WEST AFRICA.

Northern districts (no definite locality indicated), I. 1930, *Drinkuth* 4 (B, K, N, W); Outjo, V. 1933, *Ter Horst* TM. 31844 (T); Spitzkopje, I. 1937, *Boss* TM. 36401 (K, N, T); Karibib, IV. 1913, *Engler* 6163 (B, K); Haikamchab, I. 1907, *Galpin et Pearson* 7435 (K, N, S); Awas mountains, V. 1936, *Boss* TM. 36237 (T); Reise von Walfishbay nach Okahandja, XI. 1885, *Lüderitz* 72 (B, Z); Hereroland, anno 1885/1886, *Lüderitz* 43 (B).

TYPE SPECIMENS.

The two sheets *Lüderitz* 72 et 43 are deposited in the Botanisches Museum, Berlin-Dahlem.

REMARKS.

Henrard (*Crit. Rev.* 552) states that the specimens on which he based his description are in a very imperfect condition. Owing to the very overmature and damaged condition of *Lüderitz* 72, the present author has found it somewhat difficult to align and identify modern material with this species. After much deliberation and careful examination of the type specimen, he has decided that *A. secalina* *Henrard* is a close ally of *A. Hochstetteriana* Beck ex Hack. It differs from the latter species by having glabrous glumes. The inverse length of the glumes is not a constant difference, since this character is also met with in *A. Hochstetteriana*.

Henrard's type shows the presence of spikelets in which the column of the lemma is not twisted. This may be explained by the fact that these lemmas are not well-developed. Otherwise they would have disarticulated, since most of the other columns were shed. The more recent gathering *Galpin & Pearson* 7435 also shows the presence of spikelets in which the column of the lemmas is either twisted or not twisted, a character which is thus not reliable. The type specimen has naked central awns. Careful examination has revealed the presence of many "tubercles" in the upper part of these awns. These "tubercles" undoubtedly represent the points of attachment of hairs, and thus the awns at one time or other were plumose. The opinion voiced by *Henrard* that this species is an "anomalous" [*Monogr. Gen. Aristida* 1, 24 (1929)] member of the § *Schistachne* can thus no longer receive any support.

3. *A. proxima* Steud. Syn. Pl. Glum. 1. 145 (1854); Dur. et Schinz, Consp. 5. 807 (1894); Stapf in Dyer, Fl. Cap. 7. 566 (1899); Henrard Crit. Rev. 3. 468 (1928); Henrard Monogr. 1. 38 cum ic. tab. 4 (1929); Theron in Fedde, Rep. 40. 14 (1936).

Elegant, erect or ascending glaucous *perennial*. Culms simple or more rarely branched near the base which appears to be a creeping rhizome, 15–35 cm. high, densely woolly at and just below the nodes, otherwise pubescent, terete or subcompressed, 2–6-noded; internodes usually shortly exserted. Sheaths striate, tight, pubescent with adpressed hairs, the sheath-nodes with a ring or tuft of long white hairs, densely tomentose or woolly; ligules a ciliate rim; auricles densely bearded, the hairs united into a ring at the junction of the blade and the sheath; blades convolute, filiform, rigid and subpungent, glaucous, adpressedly pubescent in lines or becoming glabrous beneath, more or less scabrous-hirtellous on the upper surface, curved, gradually narrowed but not setaceously pointed, up to 10 cm. long, but usually much shorter. Panicle narrow, but rather loose, up to 15 cm. long, but usually shorter, well- or shortly-exserted or sheathed by the uppermost leaf at the base; peduncle pubescent or hairy, angular or subterete; axis of panicle subterete and grooved, somewhat contorted, adpressedly hairy, the axils densely woolly; branches binate, erect, simple or the lower branched above the middle, naked in lower part, up to 5 cm. long, few-flowered, usually only 2–5-spiculate, pubescent; pedicels erect or more or less curved, up to 8 mm. long or sometimes as long as the glumes, subclavate, densely woolly towards their tips. Spikelets yellowish and pallid. Glumes unequal, glabrous and smooth, 3-nerved, the lateral nerves shorter than the midnerve and anastomosing with it; the lower 6.5–10 mm. long, the upper 8–11.5 mm. long, both acuminate and mucronate from a slightly bifid apex, both scaberulous only on the keel above. Lemma glabrous, lanceolate-oblong, rounded at the base, abruptly narrowed into the 1.5–2 mm. long callus, body of lemma including the callus 5.25–7.0 mm. long; callus very acute and narrow, long-pointed, densely hairy; articulation of the lemma about 3.5–5 mm. from the base of callus. Awns deciduous with upper part of the lemma, subequal or usually the central awn longer, plumose all along, the lateral from 5.5–9.0 mm. long, the central awn 6.0–11.5 mm., tips not exserted, feathery part very obtuse in outline. Pale broader than long, truncate, nerveless. Lodicules very obtuse. Anthers 4 mm. long.

CAPE PROVINCE.

Lady Grey distr.—Between Kraai River and Wittebergen, Zeyher 194 (B, K, P, V, Z). Aliwal North distr.—Aliwal North, XII. 1892, Flanagan 1657 (A, BH, N, K); Sister Stephanie 212 (A, BH, D, K, N).

TYPE SPECIMEN.

Zeyher 194 is deposited in Herb. Steudel, Museum National d' Histoire Naturelle, Paris.

4. *A. namaquensis* (Nees) Trin. et Rupr. Spec. Gram. Stip. 174 (1842); Walp. Ann. Bot. 3. 750 (1852); Steud. Syn. Pl. Glum. 1. 145 (1854); Dur. et Schinz, Consp. 5.805 (1894); Hack. in Bull. Herb. Boiss. 4 Append. iii. 19 (1896); Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915); Dinter in Fedde, Rep. 15. 342 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 403 (1925) pro parte; Henrard Crit. Rev. 2. 369 (1927); Henrard Monogr. 1. 39 cum ic. tab. 3 (1929); Range in Fedde, Rep. 33. 8 (1933) pro parte.

A. dregeana Trin. et Rupr. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte, non Trin. et Rupr. *A. fruticans* Burchell, Travels 1. 492 (1822) nomen tantum. *A. lutescens* Trin. et Rupr. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915), non Trin. et Rupr. *A. namaquensis* Trin. ex Steud. Nomencl. ed. 2. 1. 131 (1842); Stapf in Dyer, Fl. Cap. 7. 566 (1899). *A. namaquensis* (Nees) Trin. et Rupr. var. *vagans* (Nees) Walp. Ann. Bot. 3. 750 (1852). *A. pungens* Desf. sec. Hack. in Bull. Herb. Boiss. 4 Append. III. 19 (1896); sec. Garabedian in Ann. S. Afr. Mus. 16. II. 404 (1925), omnes non Desf. *Arthratherum namaquense* Nees, Fl. Afr. Austr. 1. 185 (1841); Presl. Bot. Bemerk. 121 (1844); Linnæa 20. 253 (1847).

Suffrutescent with a long creeping rhizome, stoloniferous, innovation-buds covered with densely imbricate scale-like sheaths, the latter striate and glabrous except for the

woolly lower margins, and bearing reduced deciduous spinelike blades. *Culms* fascicled, ascending or prostrate, woody below, simple or usually with fascicles of erect branches from the lower or the middle nodes, at times very long and reaching a height of 2 meters (*Bryant*), glabrous and smooth. *Sheaths* very tight, firm, pallid, glabrous, striate or smooth, more rarely more or less hairy, longer or slightly shorter than the internodes; *ligules* and auricles minutely ciliate only; collar smooth; *blades* setaceous or subulate, convolute, the lower very short, very rigid and pungent, the upper longer, up to 25 cm. long, glaucous, glabrous, smooth on the lower surface, hispidulous on the upper surface. *Panicle* more or less exserted, narrow, linear, more or less contracted but rather loose, up to 30 cm. long or usually shorter; rachis straight or subflexuous, nearly smooth, branches solitary, nearly sessile, erect or suberect, bipartite nearly from the base, or the branchlets fascicled, the lower ones up to 7.5 cm. long, scabrous and filiform like the branchlets, lateral spikelets with branches much shorter than the glumes. *Spikelets* yellowish, pallid, erect. *Glumes* rather firm, unequal, lanceolate to linear-lanceolate, acuminate, tips minutely truncate or slightly bifid, 3-nerved, glabrous, involute, the lower 8–13 mm. long, the upper 9.5–15 mm. long. *Lemma* subcylindric, glabrous, produced into a straight or somewhat twisted short beak, the body articulated 2.5–5 mm. below the branching-point of the awns, total length of lemma and column 8–11 mm; *callus* conical 1.5–2 mm. long, acute and pointed, hairy. *Awns* somewhat unequal and variable in length; the central from 11–25 mm. long, the lateral from 8–18 mm. long, all the awns plumose to the very tips, the central subobtuse and the lateral subacute in outline, the side bristles finer than the central awn and scantily adpressedly plumose at the base, more densely so above. *Pale* broad, about 1.5 mm. long, nerveless. *Lodicules* 1 mm. long, few-nerved. *Anthers* 4.5 mm. long.

SOUTH-WEST AFRICA.

Omuvaruma river, XII. 1938, *Volk* 403 (D); below Ababes, Tsondab River, XII. 1915, *Pearson* 9155 (K, S); Haikamchab, I. 1907, *Galpin et Pearson* 7426 (BH, K, N, P, S); Awas mountains, I. 1916, *Pearson* 9646 (S); between Choaberib and Gurumanes, I. 1916, *Pearson* 9416 (K); Rehoboth, XII. 1890, *Fleck* 21a (Z); between Zendinggrab and Kub, III. 1905, *Von Trotha* 22 (B); Orab, *Dinter* 2027 (B, W); Gründoorn, VI. 1931, *Oertendahl* 334b (K, N); Khamis, Riverbed of Konkip, *Schultze* 471 (B); Beersheba, I. 1931, *Sordahl* 44 (EM, W); Kunguibgebirge, *Range* 1062 (B); Lüderitzbucht, *Schäfer* 377 (B); Rotkuppe Station, II. 1909, *Pearson* 4189 (A, D, K, S); 18 KM west of Aus, II. 1909, *Pearson* 4203 (BH, K); Aus, *Schenck* 171 (Z); West of Aus, II. 1909, *Pearson* 4206 (K) et 4208 (K) et 4217 (A, K); Buchholzbrunn, riverbed, II. 1909, *Pearson* 3644 (K) et 3645 (BH, K); Sandverhaar, II. 1909, *Pearson* 3710 (K, Z) et 3713 (BH, D, K, N) et 4343 (BH, K, N); Sandverhaar, I. 1910, *Schäfer* 284 (B); Inachab, XII. 1897, *Dinter* 1108 (Z); Great Karasberg, XII. 1912, *Pearson* 8078 (B, K) et I. 1913, *Pearson* 8497 (BH, BM, K, S, Z); Holog, I. 1916, *Pearson* 9714 (B, K, S) et 9745 (BH, K, S); Kanus, I. 1910, *Range* 899 (B); Khanibes, Horos, X. 1907, *Hartmann* 14 (B); Gabis, I. 1909, *Pearson* 4324 (K); 20 KM north of Raman's Drift, I. 1909, *Pearson* 4532 (K, S); Warmbad, 1888, *Wandres* 28 (Z); without precise locality: *Wyley* s.n. (V); *Dinter* 6413 (G); *Range* 748 (B) et 96 (B).

CAPE PROVINCE.

Little Namaqualand distr.: Between Arris Drift and Arnisfontein, X. 1926, *Pillans* 5322 (K); Lekkersing, IX. 1935, *Taylor* 1083 (N); Eenriet, I. 1909, *Pearson* 3082 (K); South of Brakfontein, X. 1926, *Pillans* 5565 (BH); Aggenys, I. 1909, *Pearson* 2947 (K, N); between Arkoep and Mesklip, XII. 1910, *Pillans* 5898 (BM, K, N, S); Kamabies, XII. 1908, *Pearson* 3953 (BH, K); Kamiesberg, *Zeyher* 74 (B, G, V, W, Z); Alewynsfontein, XII. 1908, *Pearson* 3335 (K); between Plaatsklip and Bitterfontein, I. 1908, *Pearson* 3298 (A, D, K, S). Calvinia distr.: At Kamos, Komseep, Springbokkuil and Lospers Plaats, *Zeyher* 1814 (A, BH, BM, G, K, N, P, S, V, Z); Brakrivier, XII. 1908, *Pearson* 3901 (K); Doornriver, XII. 1908, *Pearson* 3883 (BM, N, T); near Schurkraal, XII. 1908, *Pearson*

3080 (BM, K); between Grouwater and Klipplaat, XII. 1908, *Pearson* 3282 (A, BM, K, S); Schurkraal, XII. 1908, *Pearson* 4999 (A, K, N). Van Rhynsdorp distr.: Between Kamiesberg and Nieuwfontein, *Drège* (2545) (B, BM, G, K, N, W). Clanwilliam distr.: Between Builshoek and Doorn River, XI. 1910, *Pearson* 5400 (K); Olifants River valley, XII. 1936, *Adamson* 1556 (N). Ceres distr.: Papekuil, XI. 1908, *Pearson* 3991 (A, BH, BM, K, N, S). Sutherland distr.: Roggeveld, Korhaan's Kloof, *Rehmann* 3187 (B, Z). Laingsburg distr.: At Matjesfontein, *Rehmann* 2910 (BM, K, V, Z). Prince Albert distr.: Fraserburg Road, I. 1903, *Marloth* 3056 (N); by the Gamka River, *Mundt et Maire* s.n. (K). Jansenville distr.: Jansenville, *Joseph* 8639 (N); Klipplaatrivier, *Drège* 3924 (B, G, P). Graaff-Reinet distr.: Near Riviertjie, III. 1869, *Bolus* 1981 (BH, K, Z). Murraysburg distr.: Murraysburg, VII. 1878, *Tyson* 558 (D) et XII. 1878, *Tyson* 258 (BH). Middelburg distr.: Grootfontein, IV. 1911, *Pillans* 1854 (K). Fraserburg distr.: Williston, XI. 1921, *Foley* 189 (N) et II. 1926, *Smith* 2457 (N). Carnarvon distr.: Nieuweveld, between Brakrivier and Uitvlugt, *Drège* (B, G, O, P, S, V). Prieska distr.: Prieska, III. 1931, *Bryant* 604 (B, K, W) et II. 1932, *Bryant* 650 (K, N) et *Bryant* 4147 (Mc). Hay distr.: Griquatown, XII. 1811, *Burchell* 1885 (G, K, P) et XII. 1894, *Marloth* 2093 (N, St); Krom Aar, III. 1921, *Wilman* 2457 (K, Mc); Black Ridge, III. 1934, *Wilman* 3059 (BH, Mc); Niekerks Hoop, X. 1936, *Hafstrom* 1335 (K, Mc). Gordonia distr.: Upington, IV. 1923, *Borcherds* H. 21456 (N) et V. 1923, *Borcherds* H. 21495 (K) et H. 21455 (W); do., VII. 1925, *Barnard* 36143 (S); Witkop, X. 1937, *Webb* 17 (N); Zwart Puts, X. 1911 *Wilman* s.n. (K). Without precise locality: *Ecklon et Zeyher* (A, K, N); *Mundt* s.n., (B); *Pappe* s.n. (BM); *Burke et Zeyher* (O); *Buchanan* s.n. (S).

TYPE SPECIMEN.

The type is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Bamboo Aristida. Bamboo grass. Hay grass. Heidegras. Hooigras. Stechgras. Steekgras. Steekriet. Stækkweek.

ECONOMIC NOTES.

This species is reported to be of value as a sandstay and thus may prove useful in combating erosion. Although the foliage is very coarse and prickly, *Pearson* states that it is "much eaten by stock" whereas *Pillans* states that it "does not provide grazing". It is furthermore occasionally used for thatching.

5. **A. Schlechteri** *Henrard* Crit. Rev. **3**. 541 (1928); *Henrard* Monogr. **1**. 40 et 51 cum ic. tab. I (1929).

A hybrid between *A. capensis* Thunb. and *A. ciliata* Desf. var. *capensis* Trin. et Rupr. and agreeing in vegetative characters with the former. Caespitose perennial. Culms up to 40 cm. high, but sometimes much shorter, 2-noded. Internodes exerted, terete, somewhat striate, glabrous; nodes ciliate with spreading white hairs. Leaf-sheaths tight, striate, glabrous. Ligule a ciliate rim; auricles bearded, collar glabrous. Leaves mostly basal, rather short, up to 14 cm. long, but usually about 6 cm. long, flexuous and curved, subrigid, setaceous, convolute, striate and glabrous below, hairy above. Panicle exerted, strictly erect, few-flowered; branches erect or ascending, scaberulous or smooth; pedicels slightly scabrous, spikelets lanceolate. Glumes firm and chartaceous, 3-nerved, yellowish, purple-flushed at the base, subequal to unequal, acute or subobtusely with minutely ciliate tips; the lower 11-13.5 mm. long; the upper 13-16 mm. long. Articulation of the lemma 7-7.5 mm. from the base of the callus. Lemma smooth. Callus very acute, hairy, about 2-2.25 mm. long. Column of awns slightly to strongly twisted, about 7-9 mm. long, glabrous. Central awn 3.5-4 cm. long, feathery all along to the very tip, obtuse in outline; lateral awns 1.8-2.6 cm. long, naked or sparingly plumose, often one of these plumose and the other naked, tips long-exserted, rather fine.

CAPE PROVINCE.

Little Namaqualand distr. : Windhoek, VII., 1896, *Schlechter* 8338 (A, B, BH, G, K, N, P, T, V, W, Z).

REMARKS.

Henrard states the position of the articulation to be variable, but I have made many measurements and found this variation negligible. The articulation is situated 7-7.5 mm. from the end of the callus. It is moreover the length of the column of the lemma which shows some variation (7-9 mm.), and this is probably due to the discrepancies which Henrard mentions in regard to the position of the articulation. The length of the column of the lemma is usually fairly variable even in spikelets of one and the same panicle. See also *A. subacaulis* where the length of the column is extremely variable.

6. *A. ciliata* Desf. var. *capensis* Trin. et Rupr. × *A.* ?

The number cited below consists of two sheets which undoubtedly represents a hybrid.

The plants superficially resemble *A. ciliata* Desf. var. *capensis* Trin. et Rupr. as the nodes are strongly ciliate with reflexed or spreading white hairs, the glumes are subequal, obtuse or truncate, and minutely ciliate at their apices, and they are furthermore slightly discoloured (purple?) at the base. The lemmas however disagree with the aforementioned species as the callus shows a great deal of variation in its degree of hairiness. It shows all intermediates from being densely bearded to being perfectly glabrous. The body of the lemma may show the presence of an articulation as in typical members of § *Schistachne*. The majority of lemmas however show no signs of an articulation and in this respect they agree with members placed in § *Chaetaria*. All three awns of the lemma are plumose and acute in outline. The awns are fairly rigid and have almost naked exerted tips, and in this respect are not unlike those of *A. capensis* Thunb. There are, however, no other characters which would suggest a relationship with the last-mentioned species. Owing to the plumose awns this hybrid bears some resemblance to *A. sericans* Hack. but differs from the latter in a number of important characters, viz. bearded nodes, obtuse and glabrous glumes, etc. To suggest *A. sericans* Hack. as the other parent is unwarranted since the former appears to be restricted to the High Veld area of the Transvaal and therefore almost certainly does not occur in the dry arid regions of the Kenhardt District.

CAPE PROVINCE.

Kenhardt distr. : Loog Kolk, X. 1928, *Pole Evans* 43 (N).

7. *A. ciliata* Desf. var. *capensis* Trin. et Rupr. Spec. Gram. Stip. 164 (1842); Walp. Ann. Bot. 3. 748 (1852); Dur. et Schinz, Consp. 5. 802 (1894); Dinter in Fedde, Rep. 15. 341 (1918); Henrard Crit. Rev. 1. 93 (1926); Henrard Monogr. 1. 43 cum ic. tab. 2 (1929).

A. ciliata Desf. sec. Kunth, Enum. 1. 195 (1833); Steud. Syn. Pl. Glum. 1. 143 (1854) pro parte; Dur. et Schinz, Consp. 5. 802 (1894) pro parte; Hack, in Bull. Herb. Boiss. 4. Append. III. 17 (1896); Stapf in Dyer, Fl. Cap. 7. 563 (1899) pro parte; F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915) pro parte; Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925); Range in Fedde, Rep. 33. 8 (1933) pro parte, omnes non Desf.

A. centrifuga Burchell, Travels 1. 266 (1822) nomen tantum. *A. obtusa* Del. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915) pro parte, non Del. *A. piligera* Burchell ex Schult. Mant. 2. 478 (1824); Kunth, Enum. 1. 197 (1833). *A. pubigena* Burchell, Travels 1. 288 (1822). *Arthratherum ciliatum* Nees in Linnaea 7. 289 (1832). *Arthratherum Schimperii* Nees, Fl. Afr. Austr. 178 (1841); Presl, Bot. Bemerk. 121 (1844).

Perennial, compactly caespitose, branched from near the base. Innovations forming dense tufts. Culms up to 85 cm. high but usually much shorter, densely tufted, fascicled, erect or somewhat geniculately ascending from a well-developed rootstock, simple, 2-3-noded; internodes terete, nearly smooth, with a viscous ring below the nodes, slightly

striate, somewhat swollen near the nodes, exserted; *nodes long-bearded with spreading hairs, the hairs often deciduous in old culms.* Lower leaf-sheaths crowded at the base, very broad, pallid or whitish, firm and persistent, striate, glabrous or more or less woolly along the margins; upper leaf-sheaths tight, shorter than the internodes, striate, glabrous or slightly pubescent; *ligule* a short ciliate rim, auricles shortly ciliate, those of the innovations conspicuously bearded; collar glabrous; *blades* striate, glabrous and smooth beneath, minutely hairy or hirtellous on the upper surface, convolute throughout, coarsely setaceous to pungent (when short) more or less recurved, variable in length, up to 25 cm. long but usually very much shorter. *Panicle* exserted, up to 30 cm. long, narrow but open and sometimes very loose, usually contracted and erect; axis terete or subcompressed, at times striate, glabrous; branches filiform, erect or sub-erect, solitary or usually 2-3-nate, up to about 8 cm. long exclusive of the awns, often branched from near the base; pedicels glabrous, shorter to longer than the glumes, clavate at the apex. *Spikelets* linear-oblong, pale or straw-coloured, often suffused with purple at the base. *Glumes* subequal, linear-oblong, 3-nerved, glabrous, obtuse or subacute, very firm, emarginate and usually minutely ciliolate at the apex; the lower from 8.5-11 mm. long, the upper 9-12 mm. long. *Lemma* tubulous, glabrous, smooth, gradually narrowed into a slender, twisted column of a somewhat variable length, articulated 5-7 mm. from the base of the callus, 10.5-14 mm. long up to the branching-point of the awn; *callus* long-hairy, very acute, from 1.5-2.5 mm. long; central awn 4-5 cm. long, naked in lower quarter, feathery part obtuse in outline, with a short naked or minutely plumose exserted tip; lateral awns very fine, usually sub-erect, 1.5-2.5 cm. long, sometimes slightly but inconspicuously plumose in their upper part. *Anthers* 5-5.5 mm. long.

SOUTH WEST AFRICA.

Witvley, III. 1911, *Dinter* 1972 (B); Walfishbay, *Nachtigal* 7 (B); Salzbrunn, IV. 1913, *Engler* 6560 (B); between Dabaigabis and Gründoorn, II. 1909, *Pearson* 3159 (BM, S); between Ausis and Khuias, III. 1885, *Schenck* 218 (N, V, Z); Kunguiberge, *Range* 1064 (B); Haalenberg, IV. 1929, *Dinter* 6302 (B, BH); Keetmanshoop, 1897, *Seidel* 1 (B); Mount Brukkaros, IV. 1927, *Sordahl* 38 pro parte (B, BM, W); Angra Pequena, I. 1907, *Galpin et Pearson* 7522 pro parte (N); Angra Pequena, VII. 1925, *Moss* 11516 (W) et 11517 (K, WR); do., X. 1884, *Schenck* la (Z); do., 1884, *Schinz* 668 (Z) et 669 (Z); do., IV. 1886, *Marloth* 1158 (B) et 4742 (N); Rotkuppe, II. 1909, *Pearson* 4183 (K); Garub, X. 1910, *Marloth* 5001 (N, St); do., X. 1907, *Range* 522 (B); prope Aus, 1885, *Schinz* 667 (Z, V); Kubub, II. 1907, *Range* 222 (B); Kuibis, *Range* 890 (B); do., I. 1909, *Range* 654 (B); Buchholzbrunn, II. 1909, *Pearson* 3638 (BH); Sandverhaar, II. 1909, *Pearson* 4663 pro parte (BH); Inachab, XII. 1897, *Dinter* 1104 (B, Z); Klein Karas, IV. 1931, *Örtendahl* 120 (B, K, N); do., IX. 1923, *Dinter* 5000 pro parte (N); Holoog, I. 1916, *Pearson* 9811 (K); Anibebene, 1895, *Schinz* 326 (Z); Klinghardtgebirge, VIII. 1913, *Schäfer* 548 (B) et 513 (B); Great Karasberg, 1918, *Blank* 63 (B); do., Kraaikluft, I. 1913, *Pearson* 8496 (N); near Sendlingsdrift, *Range* 1556 (B); 25 Km. north of Warmbad, II. 1909, *Pearson* 4301 (BH, N); north of Ganus, II. 1909, *Pearson* 4495 (K, T); Viols Drift, IX. 1931, *Pillans* 6395 (BH); without precise locality: Namib, *Boss* TM. 36281 (T) et *Morgenstern* 31 (B, W); Walfishbay-Otyitambi, *Lüderitz* 34 (B); *Range* 1423 (B).

CAPE PROVINCE.

Little Namaqualand distr.: Near mouth of Orange River, *Drège* 2548 (B, BM, G, K, N, O, P, S, V); Groot Derm, X. 1926, *Pillans* 5230 (BH); between Arris Drift and Anisfontein, X. 1926, *Pillans* 5247 (BH); near Bethany Drift, XII. 1910, *Pearson* 6952 (K); Richtersveld, IX. 1925, *Marloth* 12414 (N); do., VIII. 1925, *Marloth* 12309 (N); near Oograbies, I. 1909, *Pearson* 3564 (A, K, T); between Wolftoon and Henkriesfontein, I. 1909, *Pearson* 3107 (A); Goodhouse, IX. 1930, *Henrici* 2221 (N); Henkries, XI. 1897, *Schlechter* 10 (B, BH, BM, G, K, N, P, T, W); Lekkersing, IX. 1936, *Taylor* 1096 (N); Buffelrivier, IX. 1897, *Schlechter* 11257 (A, B, BH, BM, G, K, N, P, V, W, Z); Kamiesberg, *Zeyher* 74 (V). Calvinia distr.: between Losper's Plaats and Springbokkuil, *Zeyher* 1812

(A, BH, G, K, N, P, S, Z); between Plaatsklip and Bitterfontein, XII. 1908, *Pearson* 3293 (K, N); south of Klipplaat, XII. 1908, *Pearson* 3395 (BM, N, S); between Pappekuil and Stompiesfontein, XII. 1908, *Pearson* 4967 (A, BM). Clanwilliam distr.: Klaver, III. 1926, *Smith* 2600 (N); Ceres distr.: Gansfontein, XII. 1908, *Pearson* 3983 (BH, K). Beaufort West distr.: Between Dweka and Zwartbulletje, *Drège* (B, G, P, S). Fraserburg distr.: Between Patryfontein and Great Brakriver, IX. 1811, *Burchell* 1521 (K). Prince Albert distr.: Prince Albert, XII. 1906, *Bolus* 12432 (B, BH, BM, K, N); Prince Albert Road, V. 1920, *Pillans* 7060 (BH); Jakalsfontein, *Burke* 22 (K); Gamka River, *Mundt (et Maire)* (B, G, K). Murraysburg distr.: Murraysburg, *Tyson* 280 (BH). Uitenhage distr.: Uitenhage ?, *Prior* s.n. (K, S, V). Somerset East distr.: Somerset, *Bowker* s.n. (K). Middelburg distr.: Grootfontein, IV. 1911, *Pillans* 1855 (K). Victoria West distr.: Victoria West, *Schweitzer* s.n. (A). Prieska distr.: Between Modderfontein and Keikamp-poort, *Burchell* 1612-4 (K); Prieska, III. 1931, *Bryant* 607 (B, K, W); do., VIII. 1918, *Pole Evans* H. 18800 (N). Kimberley distr.: Kudusberg, VI. 1936, *Wilman* 3532 (K, Mc). Hay distr.: Niekerk's Hoop, X. 1936, *Hafstrom* 1332 (Mc); Griquatown, anno 1928, *Conradie* 1 (St). Mafeking distr.: Mafeking, IV. 1929, *Pole Evans* 2404 (N). Gordonia distr.: Upington, VIII. 1912, *McDonald* H. 8132 (K, N, T); do., IV. 1923, *Borchers* H. 21455 (K, N); Springboksvlei, XI. 1936, *Webb* 22 (N); Narougas, VII. 1925, *Barnard* 36145 (S). Without precise locality: *Pappe* s.n. (BM); *Zeyher* 1809 (BM); *Wyley* s.n. (V); *Marloth* 3718 (K, N) et 3727 (N).

ORANGE FREE STATE.

Bloemfontein distr.: Near Bloemfontein, IV. 1928, *Pole Evans* 2190 (N).

TYPE SPECIMEN.

Drège from Dweka and Zwartbulletje is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Bushman Grass. Dwa-gras. Groot Boesmangras. Grosses Toagras. Habugras. Kortbeen Twaa. Langbeen Twaa. Ochsengras. Tall Bushman Grass. Toagras.

ECONOMIC NOTES.

This species is considered a very good stock food, it is eagerly grazed by both sheep and cattle. It is said to be very drought-resistant, persists many months without rain and flowers readily after a minimum of rain.

7A. *A. ciliata* Desf. var. *villosa* Hack. in Bull. Herb. Boiss. 4 Append. III. 18 (1896); Stapf in Dyer, Fl. Cap. 7. 564 (1899); Dinter in Fedde, Rep. 15. 341 (1918); Henrard Crit. Rev. 1. 95 (1926); Henrard Monogr. 1. 42 (1929); Theron in Fedde, Rep. 40. 10 (1936).

A. ciliata Desf. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915) pro parte; Range in Fedde, Rep. 33. 8 (1933) pro parte, non Desf. *A. prodigiosa* Welw. sec. Garabedian in Ann. S. Afr. Mus. 16. II. 404 (1925) pro parte, non Welw.

This variety may be readily recognised by the possession of densely lanate or villous leaf-sheaths and leaf-blades. It appears to occur only in the very arid regions of South West Africa.

SOUTH WEST AFRICA.

Olukonda, XII. 1885, *Schinz* 649 (Z); Haikamchab, I. 1907, *Galpin et Pearson* 7413 (K, N, S); Marienthal-Orab, III. 1911, *Dinter* 2013 (B); Bei Lüderitzbucht, IX. 1913, *Range* 1883 (B); Angra Pequena, 1884, *Schinz* 663 (Z); do., I. 1907, *Galpin et Pearson* 7522 pro parte (K, S); Klinghardtgebirge, VIII. 1913, *Schäfer* 546 (B); Schakalskuppe, II. 1909, *Pearson* 4800 (K); between Aos and the Orange River, III. 1885, *Schenck* 327 (N, V, Z); Buntfeldschuh, IX. 1922, *Dinter* 3922 (B, N); North of Warmbad, II. 1909, *Pearson* 4301 (D, K).

TYPE SPECIMEN.

Schenck 327 both in the Botanisches Museum, Zürich and in the Naturhistorisches Museum, Wien.

ECONOMIC NOTES.

This variety is considered a good fodder grass for cattle and horses.

7b. *A. ciliata* Desf. var. *pectinata* Henr. Crit. Rev. **1**. 95 (1926); Henrard Monogr. **1**. 42 (1929); Theron in Fedde, Rep. **40**. 10 (1936).

This variety may be distinguished by the glumes both of which are always markedly ciliate with spreading hyaline hairs.

SOUTH WEST AFRICA.

Windhuk, 1906, *Bohr* 13 (B); Zwartbankberge (Kalkberge), IV. 1886, *Stapff* 9 [B (typus !), Z]; Aus, *Lewis* H. 19007 (N); Karubeam (Karabeam Mts. ?), VII. 1931, *Pillans* 6562 (BH).

CAPE PROVINCE.

Little Namaqualand distr.: Near Orange River mouth, VII. 1926, *Pillans* 5610 pro parte (BH, K); Clanwilliam distr.: Zoutrivier, VII. 1896, *Schlechter* 8138 (A, B, BH); Herbert distr.: Read's Drift, III. 1937, *Acock* 4321 (Mc).

TYPE SPECIMEN.

Stapff 9 is deposited in the Botanisches Museum, Berlin—Dahlem.

COMMON NAMES.

Common Groot Boesmangras. Pferdegras.

ECONOMIC NOTE.

Stapff states it to be a meagre foddergrass after rain.

7c. *A. ciliata* Desf. var. *tricholaena* Hack. in Bull. Herb. Boiss. **4** Append. III. 18 (1896); Stapf in Dyer, Fl. Cap. **7**. 564 (1899); Dinter in Fedde, Rep. **15**. 341 (1918); Henrard Crit. Rev. **1**. 95 (1926); Henrard Monogr. **1**. 42 (1929); Range in Fedde, Rep. **33** 8 (1933).

A. ciliata Desf. sec. F. Bolus in Ann. S. Afr. Mus. **9**. IV. 232 (1915); Stapf in Dyer Fl. Cap. **7**. 563 (1899); Range in Fedde, Rep. **33**. 8 (1933) omnes pro parte non Desf.

This variety may be distinguished by the upper glume which is always markedly ciliate with spreading hyaline hairs. It is often found growing side by side with *A. ciliata* Desf. var. *capensis* Trin. et Rupr., the prevalent variety of this species in South Africa.

SOUTH WEST AFRICA.

Rössingberge, XI. 1938, *Volk* 23 (D); Ababis, IV. 1913, *Engler* 6134 (K); near Welwitsch, III. 1909, *Pearson* 4472 (BH, K); Windhuk, 1906, *Bohr* 13 (B); Haikamchab, I. 1907, *Galpin et Pearson* 7413 (BH, K, N, P); do., 7412 (V); between Achterfontein and Gelwater, XII. 1912, *Pearson* 9235 (K); Lüderitzbucht, I. 1907, *Range* 204 (B); Haalenberg, IV. 1929, *Dinter* 6302 (D, K, St); Angra Pequena, XI. 1884, *Schenck* 26 (N); do., 1894, *Schinz* 672 (BH, K, Z); near Tsirub, VII. 1885, *Schenck* 10, [V, (typus !), Z]; Klinghardtgebirge, VIII. 1913, *Schäfer* 529 (B); Tsirub, *Range* 1132 (B); Great Karasberg, I. 1913, *Pearson* 8496 (BH, BM, K); Sendlingsdrift, VII. 1912, *Range* 1564 (B); 25 Km north of Warmbad, II. 1909, *Pearson* 4293 (K).

CAPE PROVINCE.

Little Namaqualand distr.: Doornpoort, X. 1926, *Pillans* 5455 (BH); between Witbank and Orange River, X. 1926, *Pillans* 5131 (BH); Henkries, XI. 1897, *Schlechter*

10 pro parte (A). Prince Albert distr.: Swarts, V. 1920, *Pillans* 7059 (B₁H). Prieska distr.: Prieska, IV. 1935, *Bryant* 607 (K, Mc). Gordonia distr.: Upington, *Pole Evans* 2175 (N). Mafeking distr.: Mafeking, IV. 1929, *Pole Evans* 2404 (K).

ORANGE FREE STATE.

Fauresmith distr.: Jagersfontein, IV. 1920, *Van der Walt* H. 19805 (N, W) et *van Breda* 31 (N).

TYPE SPECIMEN.

Schenck 10 is deposited in the Naturhistorisches Museum, Wien. A duplicate is deposited in the Botanisches Museum, Zürich.

COMMON NAMES.

Beesgras. Groot Twaagras. Tall Bushman Grass.

ECONOMIC NOTES.

This variety is considered to be a good foddergrass.

8. **A. Schaeferi** *Mez* in Fedde, Rep. **17**. 152 (1921); Garabedian in Ann. S. Afr. Mus. **16**. 404 (1925); Henrard Crit. Rev. **3**. 535 (1928); Henrard Monogr. **1**. 41 cum. ic. tab. 2 (1929); Theron in Fedde, Rep. **40**. 11 (1936).

A. ciliata Desf. var. sec. F. Bolus in Ann. S. Afr. Mus. **9**. IV. 232 (1915). *A. prodigiosa* Welw. sec. Hack. in Bull. Herb. Boiss. **4**. Append. III. 19 (1896); Garabedian in Ann. S. Afr. Mus. **16**. II. 404 (1925) pro parte; Dinter in Fedde, Rep. **15**. 342 (1918); omnes non Welw.

Perennial, compactly caespitose, branched from the base. Innovations forming rather short and dense tufts. *Culms* up to 65 cm. high but usually much smaller, densely tufted, fascicled, erect or somewhat geniculately ascending from a robust almost suffrutescent rootstock, simple, 2–3-noded; internodes terete, smooth, slightly striate, swollen and often viscous just below the nodes, usually exserted; *nodes perfectly smooth and glabrous*. Lower *leaf-sheaths* short, densely lanate, striate, at length becoming glabrous and shiny, with well-developed hyaline margins; the upper shorter than or as long as the internodes, scabrous or shortly pubescent especially along the margins, striate; *ligule* a short hairy rim; auricles pubescent or very shortly ciliate, collar glabrous; *blades* striate, nearly glabrous beneath, densely shortly villous-pubescent on the upper surface, terminating in a pungent apex; those of innovations 1–2 cm., or up to 8 cm. long, recurved, firm subulate; those of the culm leaves up to 12 cm. long. *Panicle* exserted, or at first sheathed by the uppermost leaf, up to 26 cm. long, somewhat contracted but loose; axis terete or sub-compressed, striate or grooved upwards, almost smooth; branches filiform, erect or sub-erect, solitary or 2–3-nate, up to 8 cm. long exclusive of the awns, often branched from near the base; pedicels nearly glabrous, at times almost as long as the glumes, swollen towards the apex (clavate). *Spikelets* straw-coloured, usually flushed with purple near the base. *Glumes* about equal, boat-shaped, 3-nerved, glabrous or sometimes rigidly ciliate, very firm, both 8.5–12.5 mm. long. *Lemma* tubulous, glabrous, smooth, 9–10.5 mm. long, articulated 6–6.5 mm. from the base of the callus; *callus* long-hairy, acute from 1.75–2 mm. long; central awn 4–4.5 cm. long, naked in lower third, plumose above nearly to the tip, the latter short, naked and exserted, the feathery part subacute in outline; lateral awns naked, from 1.3–2.2 cm. long. *Anthers* 5.5–6.0 mm. long.

SOUTH WEST AFRICA.

Lower Swakop, IV. 1886, *Marloth* 1203 pro parte (N); Rössingberge, XI. 1938, *Volk* 19 (D) et 26 (D); Tsauchab, II. 1909, *Pearson* 4949 (K); Lüderitzbucht (Angra Pequena), I. 1907, *Galpin et Pearson* 7583 (K); do., XI. 1908, *Marloth* 4667 (K) et IV. 1909, *Marloth* 4742 pro parte (N); do., *Schinz* 664 (Z) et *Schinz* s.n. (V); do., *Peyer* s.n. (Z); do., IV. 1929, *Dinter* in Hb. Stell. 10790 (St); Pomona, VI. 1929, *Dinter* 6421 (B, B₁H, D, G, K, St); do., X. 1913, *Schäfer* 549 (B, N).

TYPE SPECIMEN.

Schäfer 549 is deposited in the Botanisches Museum, Berlin-Dahlem.

REMARKS.

This species superficially resembles *A. ciliata* Desf. var. *capensis* Trin. et Rupr. but can be readily recognised by the beardless nodes and the firm subulate leaf-blades.

8a. **A. Schaeferi** Mez var. **biseriata** Henrard Monogr. 1. 41 (1929); Henrard Crit. Rev. Suppl. 739 (1933).

In general appearance this variety resembles the species but may readily be distinguished by having shorter glumes, of which the upper (gluma II) is dorsally rigidly ciliate with long hyaline hairs.

SOUTH WEST AFRICA.

Welwitsch, I. 1907, *Galpin et Pearson* 7590 (N, K, S, V).

TYPE SPECIMEN.

The type specimen is deposited in the Naturhistorisches Museum, Wien.

REMARKS.

This variety is only known so far from the type gathering. It is apparently not at all a common plant.

9. **A. Dinteri** Hack. in Bull. Herb. Boiss. Ser. II. 1. 767 (1901); Dinter in Fedde, Rep. 15. 341 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925); Henrard Crit. Rev. 1. 143 (1926); Henrard Monogr. 1. 45 cum ic. tab. 4 (1929); Theron in Fedde, Rep. 40. 8 (1936).

A. coma-ardeae Mez in Fedde, Rep. 17. 152 (1921); Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925); Henrard Crit. Rev. 1. 106 (1926). *Aristida* sp. nearest *A. plumosa* Linn. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 235 (1915).

Densely caespitose erect glaucous *perennial* with intravaginal innovation shoots. *Culms* erect, often somewhat geniculate at the nodes, elegant, up to 40 cm. high, simple, 2-4-noded, the glabrous nodes equally distributed; internodes terete, scarcely striate, slightly thickened and grooved below the nodes and with depressed crateriform glands (which are more readily visible on old culms), smooth or scaberulous. *Sheaths* of the lower blades more or less reduced, 1-3 cm. long, rather thin, sometimes papery, densely striate, scabrous, pallid with broad hyaline margins; the upper tight, terete, scaberulous or scabrous especially along the margins, striate, at times slightly keeled, shorter than the internodes; *ligule* a ciliate rim; auricles densely ciliate and more or less bearded or the long hairs wanting; collar glabrous; *blades* erect or very laxly curled, linear not very rigid, setaceously convolute throughout, about 1 mm. wide when expanded, acuminate, about 12-15 cm. long, very scabrous on both surfaces and hirtellous on the upper surface, terminating in a setaceous point. *Panicle* erect, linear, rather narrow, but very lax and interrupted at the base, up to 20 cm. long including the spikelets and awns, just exerted or more or less sheathed by the uppermost leaf; axis terete and nearly smooth below, like the lower branches usually with depressed crateriform glands, upwards more or less angular and scabrous, striate; branches solitary or binate, scaberulous or nearly smooth, up to 10 mm. long, each bearing 1-3 erect adpressed spikelets on secondary branchlets (pedicels); pedicels very short, nearly sessile or up to 3 mm. long, always shorter than the glumes, scabrous, laterally grooved and slightly thickened. *Spikelets* strictly erect, whitish, glumes linear-lanceolate, about equal or slightly unequal, the lower 12-15 mm. long, 3-nerved or sub-5-nerved, acute, shortly awned, more or less hairy with soft spreading hairs, the upper glume 12-16 mm. long, narrower than the lower, 3- or 5-nerved, acute or with an inrolled subobtuse apex, less hairy than the lower glume. *Lemma* glabrous, linear-tubular, body of the lemma

from base of callus up to the branching-point of the awn 16–18 mm. long, the articulation 5–5.5 mm. from the base of the callus, the body gradually narrowed into a smooth distinctly twisted column about 4 mm. long; *callus* 1.5 mm. long, very acute; central awn spreading, from 5.5–7.0 cm. long, naked in the lower quarter part, densely plumose above, with a shortly excurrent naked tip, the feathery part acute to sub-acute in outline; lateral awns very delicate and thin, suberect, naked, from 14–18 mm. long. *Anthers* 5.5–6.0 mm. long.

SOUTH WEST AFRICA.

Haigamkhab, I. 1904, *Pearson* 503 (K); do., I. 1907, *Galpin et Pearson* 7434 (K, N) et 7436 (K, N, S); Khan River, III. 1900, *Dinter* 1485 (N, Z); Welwitsch, I. 1907, *Galpin et Pearson* 7416 (B, K, N, S) et 7419 (B, K, N, S); do., III. 1909, *Pearson* 4416 (BH, K) et 4418 (BH, K).

TYPE SPECIMEN.

Dinter 1485 is deposited in the Botanisches Museum, Zürich.

10. **A. prodigiosa** *Welw.* in Trans. Linn. Soc. **27**. 80 cum tab. 25 (1869); Dur. et Schinz, *Consp.* **5**. 807 (1894); *Welw. Cat. Afr. Pl.* **2**. I. 205 (1899) pro parte; *Henrard Crit. Rev.* **2**. 464 (1927); *Henrard Monogr.* **1**. 44 cum ic. tab. 3 (1929).

Perennial, densely caespitose. *Culms* up to 50 cm. high, erect, simple, 2–4-noded; nodes constricted, glabrous; internodes terete and somewhat striate. *Leaf-sheaths* glaucous, glabrous or puberulous; *ligule* a ciliate rim, the auricles bearded, collar glabrous; *blades* up to 10 cm. long, curved or suberect, convolute, sulcate-striate, puberulous on both surfaces. *Panicle* erect, rather loose, linear-oblong in outline, up to 30 cm. long; axis compressed or angulate, glabrous; branches usually solitary, branched from near the base. *Spikelets* pale, yellow or greenish, purple at the base. *Glumes* subequal, keeled and acute, hairy all over, or glabrous at the margins and the apex, the hairs very soft and spreading; the lower 7 mm., the upper 8 mm. long. *Lemma* including callus and column up to branching-point of the awn 6–7 mm. long; *callus* very acute, densely hairy, about 2 mm. long; central awn naked at the base, up to 2 cm. long, scantily feathery at the tip; lateral awns naked, spreading, \pm 1 cm. long.

ANGOLA.

Cabo negro, IX. 1859, *Welwitsch* 2000a (K, N); Mossamedes, IV. 1909, *Pearson* 2276 (K, N).

TYPE SPECIMEN.

Welwitsch 2000a is deposited in the British Museum (Natural History), London.

REMARKS.

Although this species has so far not been found to occur in South West Africa, it is within the bounds of likelihood that it does actually grow in the extreme north-western coastal part of that region, which from a botanical point of view is as yet almost unexplored.

- 10a. **A. prodigiosa** *Welw. var. calva* *Henrard Crit. Rev.* **3**. 467 (1928); *Henrard Monogr.* **1**. 44 (1929);

A. prodigiosa *Welw. Cat. Afr. Pl.* **2**. I. 205 (1899) pro parte.

The variety resembles the species very closely but may be easily distinguished by possessing glabrous glumes. The same general remarks with regard to the species apply to this variety.

ANGOLA.

Near Mossamedes, IV. 1909, *Pearson* 2247 (K); between Mossamedes and R. Coroca, IV. 1909, *Pearson* 2248 (K); along Mossamedes railway, IV. 1909, *Pearson* 2881 (K).

TYPE SPECIMEN.

Pearson 2881 is deposited in The Herbarium, Royal Bot. Gardens, Kew.

11. *A. capensis* Thunb. (sensu lato).

Perennial, compactly caespitose, glabrous. *Culms* simple, very rarely branched from the base, erect, up to 75 cm. high, wiry, smooth or scaberulous, 1-2-noded. *Leaf-sheaths* firm, glabrous, scaberulous or with a few scattered hairs, striate, shorter than the internodes; *ligule* a ciliate membrane; auricles glabrous or bearded; collar glabrous; *blades* filiform, convolute, up to 40 cm. long, at times overtopping the panicle, firm, at times flexuous, lower surface smooth, upper surface scaberulous to hispid. *Panicle* erect or more or less nodding, contracted, loose or effuse, somewhat secund, up to 30 cm. or more long; branches solitary, often branched from the base, branchlets ultimately capillary or filiform. Pedicels clavate. *Spikelets* erect or nodding, pale brown to purple. *Glumes* glabrous or hairy, unequal to subequal, linear-lanceolate; the lower 10-19 mm. long, the upper 11-20 mm. long. *Lemma* including the callus 5-8.5 mm. long, tubulous, dorsally smooth or pustulate; *callus* very acute, densely hairy, about 2.5 mm. long; column 1-14 mm. long, glabrous or hairy, usually twisted, shorter than or exceeding the glumes; awns unequal, the central 16-40 mm. long, the lateral 13-35 mm. long.

The above description has been drawn up so as to include the material enumerated under the following varieties. The salient points characterising each variety are enumerated separately under each of these varieties.

11a. *A. capensis* Thunb. var. *genuina* Henrard Crit. Rev. 1. 77 (1926); Henrard Monogr. 1. 50 cum ic. tab. 6 (1929).

A. capensis Thunb. Prodr. 19 (1794); Kunth Enum. 1. 95 (1833). *Chaetaria capensis* (Thunb.) Beauv. Agrostogr. 30 (1812); Roem. et Schult. Syst. Veg. 2. 395 (1817).

This variety may be distinguished by the glabrous column of the awns which is usually shorter than the glumes; at times however it exceeds the glumes by 1-2 mm. The feathers of the awns are white or canescent.

CAPE PROVINCE.

Malmesbury distr.: Darling, IX. 1905, *Bolus* 12910 (BH, N). Worcester distr.: Hex River Valley, X. 1881, *Tyson* 610 (A, K).

TYPE SPECIMEN.

Specimen β of *Thunberg* in Herb. Thunberg, Upsala, Sweden.

11b. *A. capensis* Thunb. var. *macropus* (Nees) Trin. et Rupr. Spec. Gram. Stip. 179 (1842); Walp. Ann. Bot. 3. 751 (1852); Dur. et Schinz, Consp. 5. 801 (1894); Stapf in Dyer, Fl. Cap. 7. 565 (1899); F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915); Henrard Crit. Rev. 1. 78 (1926); Henrard Monogr. 1. 50 cum ic. tab. 7 (1929); Theron in Fedde, Rep. 40. 16 (1936).

A. capensis Thunb. var. *fulviberbis* Trin. et Rupr. Spec. Gram. Stip. 179 (1842); Walp. Ann. Bot. 3. 751 (1852); Dur. et Schinz, Consp. 5. 801 (1894); Henrard Crit. Rev. 1. 78 (1926). *A. capensis* Thunb. var. *Zeyheri* Trin. et Rupr. sec. Stapf in Dyer, Fl. Cap. 7. 565 (1899) pro parte, excl. syn., non Trin. et Rupr. *Arthrurherum capense* Nees var. *macropus* Nees, Fl. Afr. Austr. 176 (1841).

In this variety the column of the awns is glabrous and usually much exceeds the glumes. The feathers of the awns are bright yellow.

CAPE PROVINCE.

Little Namaqualand distr.: Kamiesberg, *Drège* 2544 (B); do., IX. 1911, *Pearson* 6499 (BH, K); Hondeklip Bay, X. 1924, *Pillans* 18266 (BH); between Goedemanskraal and Kaus, *Drège* (N); between Kuil and Modderfontein, *Drège* (G, S). Van Rhynsdorp distr.: near Ebenezer, *Drège* (B, K, P); Van Rhynsdorp, XI. 1923, *Rood* 789 (N); do., IX. 1900, *Diels* 527 (B). Clanwilliam distr.: Karreebergen, VII. 1896, *Schlechter* 8213 (A, B, BH, BM, G, K, N, P, T, V, W, Z); Haasdrift, IX. 1925, *Levyys* 1278 (U); without exact locality, *Leipoldt* 336 (S); *Drège* (B, O); *Morris* BH. 21792 (BH); *Thunberg* (BM).

TYPE SPECIMEN.

Several sheets (leg. *Drège*, et *Ecklon*) together constituting the type are deposited in the Botanisches Museum, Berlin-Dahlem.

REMARKS.

Thunberg's gathering in the British Museum consists of a specimen in which the spikelets show the presence of a well-exserted naked column. Furthermore the awns are yellow-plumose. This sheet may thus not be considered a duplicate of the type of *A. capensis* var. *genuina* Henrard.

11c. ***A. capensis* Thunb. var. Dieterleniana** H. G. Schweickerdt in Kew Bull. 1939. p. 653. a typo glumis subaequalibus extra pubescentibusque valde distincta.

The softly hairy glumes readily distinguish this variety from any of the others.

BASUTOLAND.

Leribe distr.: Maluti Mountains, *Staples* 146 (N). Quthing distr.: Leloaleng, I. 1916, *Dieterlen* 1205 (K, N, P).

ORANGE FREE STATE.

Ladybrand distr.: Westminster, III. 1934, *Celliers* 11 (K, N).

TYPE SPECIMEN.

Celliers 11 is deposited in the National Herbarium, Pretoria.

ECONOMIC NOTES.

This variety is reported to be unpalatable.

REMARKS.

This variety superficially bears great resemblance to *A. sericans* Hack. with which species it might easily be confused. The lemma of the latter however is not articulated and it is thus that one may readily distinguish between these two plants.

11d. ***A. capensis* Thunb. var. barbata** Stapf in Dyer, Fl. Cap. 7. 565 (1899); Henrard Crit. Rev. 1. 77 (1926); Henrard Monogr. 1. 50 cum ic. tab. 6 (1929); Theron in Fedde, Rep. 40. 16 (1936).

This variety is characterised by possessing a hairy column of the awns, furthermore by well developed leaves which usually overtop the panicle.

CAPE PROVINCE.

Uitenhage distr.: Near mouth of Zwartkops Rivier, *Zeyher* 4501 (B, K, N, P, V); between Kouga and Zwartkops Rivier, *Zeyher* 4501 (A, K, S, St, Z). Port Elizabeth distr.: Humewood, XI. 1907, *Rosenbrock* 671 (B); Schoenmakerskop, III. 1910, *Paterson* 989 (A); do., XI. 1907, *Rosenbrock* 627 (B); near Port Elizabeth, *Ecklon et Zeyher* 502 (BH, BM, K, O, S, V, Z); do., V. 1896, *Kemsley* 317 (A). Alexandria distr.: VIII. 1912, *Burt Davy* 14196 (N). Bathurst distr.: Port Alfred, *Hutton* 11 (A) et 11a (A, B, BH,

D, N, S, T, Z); do., X. 1916, *Tyson* BH 14877 (D, K, N, T); do., XI. 1922, *Britten* 2994 (A); do., VII. 1914, *Salisbury* 109 (WR, Z). East London distr.: East London, IV. 1903, *Galpin* 6557 (A, BH). Kentani distr.: Kei-mouth, V. 1893, *Flanagan* 1782 (BH, N, S); Gogwana River mouth, *Pegler* 265 (A, BH, N, Z). Without precise locality: *Pappe* s.n. (BM).

TYPE SPECIMEN.

The syn-types are all deposited in The Herbarium, Royal Bot. Gardens, Kew.

REMARKS.

This variety appears to have a well-defined geographic distribution, being restricted (or almost so) to the coastal areas of the Eastern Cape.

11e. *A. capensis* Thunb. var. *canescens* Trin. et Rupr. Spec. Gram. Stip. 178 (1842); Walp. Ann. Bot. 3. 751 (1852); Dur. et Schinz, Consp. 5. 801 (1894); Henrard Crit. Rev. 1. 77 (1926); Henrard Monogr. 1. 51 cum ic. tab. 6 (1929).

A. capensis Thunb. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915). *A. capensis* Thunb. var. *Zeyheri* (Nees) Walp. Ann. Bot. 3. 751 (1852); Dur. et Schinz, Consp. 5. 801 (1894); Stapf in Dyer, Fl. Cap. 7. 565 (1899); Henrard Crit. Rev. 1. 79 (1926); Henrard Monogr. 1. 51 cum ic. tab. 7 (1929). *A. Zeyheri* (Nees) Steud. Nomencl. Bot. ed. 2. 1. 132 (1841); Henrard Crit. Rev. 3. 686 (1928). *Arthratherum Zeyheri* Nees, Fl. Afr. Austr. 177 (1841).

This variety is distinguished by the hairy column up to 12 mm. long, glabrous glumes, and a panicle which is not overtopped by the leaves.

CAPE PROVINCE.

Clanwilliam distr.: Kardouw Krantz, XI. 1910, *Pearson* 5304 (BH, K); Malmesbury distr.: Moorreesburg, XI. 1885, *Bachmann* 870 (B, V, Z); Darling, VIII. 1883, *Bachmann* 597 (B, Z); Malmesbury, VIII. 1883, *Bachmann* 873 (B). Tulbagh distr.: Tulbagh, *Ecklon* (B); Tulbaghklouf, *Ecklon et Zeyher* 71 (77 ?) (A, N, V); Witzenberg, *Zeyher* (B). Worcester distr.: Worcester, *Rehmann* 2583 (K, Z) et 2669 (B, K, Z) et 2670 (B, V); Winterhoek, *Drège* (B); Worcester, *Zeyher* 77 (B, G); do., II. 1935, *Breda* 3 (N). Paarl distr.: Paarlberg, IV. 1830, *Drège* 8103 (B); Bain's Kloof, XI. 1896, *Schlechter* 9105 (A, B, BM, G, K, N, P, V, W, WR, Z). Hercules Pillar, VIII. 1931, *Levyms* 3175 (U). Cape distr.: Cape Town, *Burchell* 890 (K); do., VII. 1929, *Hitchcock* 24086 (W); do., XII. 1810, *Burchell* 272 (K); do., XII. 1881, *Tyson* 2392 (A); Rondebosch, II. 1816, *Bergius* 209 (B); Constantia, *Ecklon et Zeyher* 85 (G, N, V); do., XII. 1896, *Wolley Dod* 2235 (BM); Claremont, III. 1892, *Schlechter* 557 (B, P, Z); Wynberg, *Zeyher* 4502 (S) et *Zeyher* s.n. (A, S); Table Mountain, *Ecklon* 977 (K, O) et *Hitchcock* 24083 (K, N, W); Doornhoogte, *Ecklon* 72 (B, S); Camps Bay, III. 1936, *Adamson* 812 (U); Simons Bay, XII. 1852, *Milne* 255 (K) et *McGillivray* 391 (K); Eerste Rivier, XI. 1838, *Krauss* s.n. (V). Stellenbosch distr.: Somerset West, X. 1929, *Sandwith* 153 (K); Stellenbosch, *Duthie* 1646 (Sreg) et 1646a (Sreg). Caledon distr.: Houwhoek, II. 1896, *Schlechter* 7366 (A, B, BH, G, K, S, W, Z); Genadendal, XII. 1896, *Schlechter* 9843 (A, B, BH, G, K, N, P, T, W, Z); do., I. 1885, *Bolus* 7432 (B, K). Riverzondereinde, XI. 1828, *Drège* 8104 (B). Riversdale distr.: Riversdale, *Rust* 362 (B) et 363 (B) et 490 (B); do., II. 1893, *Schlechter* 2173 (B, Z); do., *Muir* 2133 (W). Uitenhage distr.: Uitenhage, *Bowie* s.n. (K); Port Elizabeth distr.: Humewood, V. 1914, *Patterson* 1095 (A). Without precise locality: *Bergius* (K); *Belanger* 153 (G); *Sieber* 129 (G); *Harvey* 298 (BM, K) et 324 (BM, K).

TYPE SPECIMEN.

Bergius s.n. is deposited in the Trinius Herbarium, Leningrad.

REMARKS.

The sheets enumerated under this variety by no means form a homogeneous unit. There is a great deal of variation in the length of the glumes and column of the awns.

There appears to be a gradual transition from *var. Zeyheri* to *var. canescens* and I have not been successful in distinguishing clearly between the two "varieties". For this reason a broader conception of the variety has been taken, and *var. Zeyheri* has been sunk in synonymy.

The specimens enumerated here are the more common form of the species and appear to be centred around the Cape Peninsula or in the coastal areas south-east from there.

12. **A. damarensis** Mez in Fedde, Rep. **17**. 152 (1921); Garabedian in Ann. S. Afr. Mus. **16**. II. 401 (1925); Henrard Crit. Rev. **1**. 130 (1926); Henrard Monogr. **1**. 53 cum ic. tab. 8 (1929); Theron in Fedde, Rep. **40**. 14 (1936).

Perennial, laxly caespitose, robust, up to 1.2 metres high, branched from near the base. Innovations intravaginal. *Culms* simple, erect, 2 mm. in diam. at the base, 3-4-noded; nodes equally distributed, slightly constricted; internodes terete, glabrous and smooth, minutely striate, exserted. Lower *leaf-sheaths* distichous and flabellate, gaping, yellow, striate, glabrous, rounded on the back, up to 6 cm. long, margins hyaline sometimes hairy; the upper leaf-sheaths much longer, up to 15 cm. long, tight, terete, striate, glabrous, minutely pubescent along the margins, scaberulous between the nerves, shorter than the internodes; *ligule* a minutely but densely ciliolate rim; auricles thickened, pubescent, those of the innovations long-bearded; *blades* of the culm-leaves very firm, almost junciform, the lower fairly short (\pm 8 cm. long), the upper up to 40 cm. long, narrowly convolute, glaucous, glabrous, striate, scaberulous along the furrows beneath, upper surface scabrous, up to 3 mm. wide, narrowed into a pungent tip; blades of the innovations shorter, the margins more conspicuously pubescent above. *Panicle* sheathed at the base by the uppermost leaf, about 45 cm. long, rather narrow, contracted but not very dense or spike-like; axis subterete, deeply striate (grooved), glabrous, angular upwards; branches solitary to 3-nate, the longer ones 6-8 cm., 10-12-flowered, naked at the base, erect and adpressed, scaberulous; pedicels subclavate, shorter or slightly longer than the glumes. *Spikelets* erect, pallid or yellow. *Glumes* with an inverse position, almost glabrous, scabrous or minutely pilose towards the apex and margins; the lower 3-5-nerved, abruptly narrowed into the short mucro, 12-17 mm. long; the upper 3-nerved, the keel scabrous upwards, 12-14 mm. long, tip subacute or truncate with a short mucro. *Lemma* glabrous, including the callus about 5-6.5 mm. long; *callus* rather blunt, 1 mm. long, hairy; column of awns 5-7 mm. long; central awn densely long-plumose, obtuse in outline, without an exserted tip, 15-22 mm. long; lateral awns plumose, 9-15 mm. long. *Anthers* 5-6.5 mm. long.

SOUTH WEST AFRICA.

Khan-Schlucht, II. 1936, *Boss* TM. 35640 et NH. 21076 (K, N, T); Haigamkhab, I. 1907, *Galpin et Pearson* 7577 (B, K, N, S); about 30 miles from Swakopmund, XII. 1929, *Moss* 17837 (N, WR).

TYPE SPECIMEN.

Galpin et Pearson 7577 is deposited in the Botanisches Museum, Berlin-Dahlem.

13. **A. sabulicola** Pilger in Engl. Bot. Jahrb. **40**. 81 (1908); F. Bolus in Ann. S. Afr. Mus. **9**. IV. 235 (1915); Dinter in Fedde, Rep. **15**. 342 (1918); Garabedian in Ann. S. Afr. Mus. **16**. II. 404 (1925); Henrard Crit. Rev. **3**. 526 (1928); Henrard Monogr. **1**. 53 cum. ic. tab. 11 (1929); Range in Fedde, Rep. **33**. 9 (1933); Theron in Fedde, Rep. **40**. 17 (1936).

Perennial, very robust, tall and stiff, up to 2 metres high, from a much-branched vigorous rhizome. Subterranean branches developing in all directions, with scale-like leaves and fibrous roots at the nodes. *Culms* rigid, strictly erect, glabrous, fasciculately branched, with the branches erect; internodes included or exserted, glabrous or somewhat viscose just below or above the nodes (at the mouth of the leaf-sheaths?), sometimes with minute depressed cateriform glands?; nodes glabrous. *Leaf-sheaths* long, longer or shorter than

the internodes, tight, striate, glabrous, often with minute gland-like depressions between the nerves, the lower merely short scales; *ligule* a shortly ciliolate rim; auricles pubescent or almost glabrous; collar glabrous; *blades* very rigid, thick, stiffly erect, 25–40 cm. long, often much longer, involute or complicate, junciform, very acute and pungent, terete, smooth on lower surface, hirtellous or scabrous on the upper surface, many-nerved, the margins not thickened (when flattened out) up to 5 mm. broad at the base. *Panicle* shorter than the blades, narrow, densely spiciform, 10–30 cm. long, about 1–2 cm. broad at the base; branches short, divided and spikelet-bearing nearly from the base; the lower branches up to 5 cm. long, adpressed and more or less naked at the base. *Spikelets* densely congested, yellowish. *Glumes* quite smooth, slightly unequal, subobtuse or acute; the lower 3-nerved, 8–11 mm. long; the upper 1-nerved, 9–12 mm. long. *Lemma* punctulate or smooth, including the callus 4.75–6 mm. long; *callus* pungent, very acute, curved, about 1.5 mm. long, densely bearded, especially above; column very short, 1–1.5 mm. long. Awns subequal, densely plumose to the tips, 5.5–10 mm. long, acutish in outline, the central usually somewhat longer than the lateral; branching point of awns produced into 2 thin, hairy appendages, bearing a pencil of hairs at the subobtuse tips. *Caryopsis* 4 mm. long, 1 mm. broad, spindle-shaped, anteriorly compressed; scutellum about one-third as long as the fruit.

SOUTH WEST AFRICA.

Rotkop, II. 1929, *Dinter* 6009 (B, BH, D, G, K, St); north of Rotkuppe Station, II. 1909, *Pearson* 4185 (BH, K); Haris, I. 1907, *Range* 174 (B) et 179 (B); Kuisebthal, IV. 1886, *Stapf* 10 et 11 (B); in the Kuiseb River at Walfishbay, VII. 1888, *Gürich* 122 (B); Rooibank near Walfishbay, *Schultze* 379 (B); Schwarzbank along Kuiseb River, VII. 1888, *Gürich* 119 (B); Anichab, II. 1907, *Range* 209 (B, K); Anichab, III. 1907, *Peyer* 248 (*Schäfer* 248) (B, N, V); Lüderitzbucht, *Peyer* s.n. (Z); Gun-Anichab, *Peyer* s.n. (Z); Lüderitzbucht, IV. 1907, *Marloth* 4741 (K); do., IV. 1907, *Range* 209a (B, N); Garub, *Schäfer* 1269 (B).

TYPE SPECIMEN.

The syn-types are deposited in the Botanisches Museum, Berlin-Dahlem. They are *Schultze* 379, *Gürich* 119 et 122.

ECONOMIC NOTES.

Used by the natives for plaiting mats. These are used to cover their huts. The mats easily imbibe moisture and thus become impervious to rain.

14. **A. Marlothii** Hack. in Engl. Bot. Jahrb. **11**. 400 (1889); Dur. et Schinz, Consp. **5**. 804 (1894); Hack. in Bull. Herb. Boiss. **4** Append. III. 19 (1896); Stapf in Dyer, Fl. Cap. **7**. 567 (1899); Henrard Crit. Rev. **2**. 334 (1927); Henrard Monogr. **1**. 82 cum ic. tab. 21 (1929); Theron in Fedde, Rep. **40**. 19 (1936).

A. lutescens Steud. var. *Marlothii* Stapf in Dyer, Fl. Cap. **7**. 567 (1899); Dinter in Fedde, Rep. **15**. 342 (1918); Garabedian in Ann. S. Afr. Mus. **16**. II. 403 (1925). *A. lutescens* Steud. sec. Hack. in Bull. Herb. Boiss. **4**. Append. III. 18 (1896) pro parte; Dinter in Fedde, Rep. **15**. 342 (1918) non Steud. *A. lutescens* Trin. et Rupr. sec. Engler in Engl. Bot. Jahrb. **19**. 129 (1894). *A. namaquensis* (Nees) Trin. et Rupr. sec. Garabedian in Ann. S. Afr. Mus. **16**. II. 403 (1925); Range in Fedde, Rep. **33**. 8 (1933) pro parte, non (Nees) Trin. et Rupr.

Perennial, strictly erect, almost suffrutescent, with a thick rhizome. Innovations intravaginal, densely sheathed at the base by firm, reduced mucronate (blades!) scales. *Culms* erect (or somewhat ascending), simple, terete, glabrous, many-noded; internodes all included, or usually the upper 1 or 2 exerted, grooved or somewhat angular just below the nodes, glabrous; nodes bearded with conspicuous white hairs. *Leaves* congested at the base of the culms, glaucous; sheaths tight, terete, the lower longer and the upper usually shorter than the internodes, somewhat striate, glabrous; *ligule* a short ciliate rim; auricles glabrous or minutely ciliate; collar glabrous; *blades* linear, acuminate, pungent,

3-7.5 cm. long, very rigid, spreading, often somewhat recurved, convolute and junciform, 1.5 mm. in diameter, glabrous and somewhat grooved beneath, puberulous on the upper surface, prominently equally 5-7-nerved. *Panicle* effuse, pyramidal, up to 25 cm. long, very lax and open; axis glabrous, angular and somewhat grooved upwards; branches filiform, glabrous, with distinct pencils of hairs in their axils, lower branches semi-whorled or subfasciated, often solitary, the longer branchlet in each branch 5-6-flowered, the others 2-3-flowered; pedicels glabrous, filiform, slightly thickened upwards, often flexuous or curved, as long as or longer than the glumes. *Spikelets* linear-lanceolate, yellowish or greenish. *Glumes* lanceolate, acuminate, shortly awned, glabrous, 3-nerved; the lower 10-12 mm. long, slightly scaberulous or hirtellous on the keel above; the upper from 12-14 mm. long, scaberulous upwards on the keel. *Lemma* linear-oblong, including the callus 6-8 mm. long; callus oblique, densely hairy, very acute, 2 mm. long; awns somewhat unequal, all plumose; column very short, about 0.5-1.5 mm. long, not twisted; central awn up to 20 mm. long, feathery to the very tip, obtuse in outline; lateral awns apparently naked, but seen under a strong lens distinctly plumose, or conspicuously so, from 12-15 mm. long. *Anthers* 4.5-5.5 mm. long.

SOUTH WEST AFRICA.

Near Haris, I. 1907, *Range* 181 (B); Sandfontein near Walfisbay, IV. 1886, *Marloth* 1176 (A, B, BH, K, S); Walfisbay, IV. 1905, *Schultze* 380 (B); Scheppmannsdorf, *Stapff* 13 (B); Schwarzbank along Kuiseb River, VII. 1888, *Cürich* 117 (B); Tsaukaib, XI. 1909, *Marloth* 4665 (K, N); Aus-Namib, X. 1910, *Marloth* 5002 (N); 50 Km. west of Kuibis, I. 1913, *Range* 1830 (B); Garub, III. 1908, *Kolonialamt* s.n. (B).

TYPE SPECIMEN.

Marloth 1176 is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Goa-gras. Stechgras. Löwengras.

ECONOMIC NOTES.

A good but scanty foddergrass as long as the shoots are green.

15. **A. lutescens** (Nees) Trin. et Rupr. Spec. Gram. Stip. 173 (1842); Walp. Ann. Bot. 3. 750 (1852); Steud. Syn. Pl. Glum. 1. 145 (1854); Dur. et Schinz, consp. 5. 804 (1894); Hack. in Bull. Herb. Boiss. 4 Append. III. 18 (1896) pro parte; Stapf in Dyer, Fl. Cap. 7. 567 (1899) excl. syn. pro parte; Garabedian in Ann. S. Afr. Mus. 16. II. 403 (1925); Henrard Crit. Rev. 2. 316 (1927); Henrard Monogr. 1. 84 cum ic. tab. 22 (1929); Range in Fedde, Rep. 33. 9 (1933); Theron in Fedde, Rep. 40. 18 (1936).

Arthratherum lutescens Nees, Fl. Afr. Austr. 179 (1841); Presl, Bot. Bemerck. 121 (1844).

Perennial, with a creeping rhizome, covered like the base of the culms and the innovation-buds with scale-like pallid sheaths, usually much-branched. *Culms* erect, slender, fascicled, terete, glabrous and smooth, many-noded, up to 70 cm. long; internodes glabrous, terete, the upper usually exerted; nodes glabrous. Lowermost *leaf-sheaths* pallid, striate, glabrous or more or less hairy, with much-reduced blades; leaf-sheaths of the culms tight, glabrous, somewhat striate, the upper usually somewhat shorter than the internodes; *ligule* a ciliolate short rim; auricles minutely pubescent; collar glabrous; *blades* subulate, convolute and pungent, up to 12 cm. long but usually shorter, rigid, curved, spreading, glabrous and smooth beneath, puberulous and hirtellous on the upper surface. *Panicle* ovate or pyramidal, very lax and open, in depauperated specimens somewhat contracted, erect, up to 25 cm. long; rhachis smooth; branches 2-3-nate or solitary and divided nearly from the base, remotely and sparsely branched, filiform, flexuous and smooth, the axils swollen and glabrous, lower branches up to 8 cm. long, few-flowered. Pedicels smooth, curved or flexuous, rather

long, those of the lateral spikelets shorter or more rarely as long as the glumes. *Spikelets* scattered, often nodding, light green or yellowish. *Glumes* lanceolate, unequal, gradually narrowed, not awned, with an obtuse, truncate or toothed apex, glabrous, 3-nerved, the lateral nerves not or scarcely anastomosing; the lower 9–11 mm. long; the upper 11.5–14 mm. long. *Lemma* subcylindric, rounded at the base, suddenly narrowed into the callus, including the latter 6–7 mm. long; *callus* 2–2.5 mm. long, shortly hairy, very acute; column of awns 2–5 mm. long, twisted; central awn up to 2.7 cm. long, scantily hairy at the base, densely plumose to the very tip, the feathery part acutish in outline; lateral awns 9–23 mm. long, very fine, apparently glabrous but scantily and adpressedly ciliate.

SOUTH WEST AFRICA.

Omuramba and Omatoke, VI. 1911, *Seiner* 700 (50) (B); Scheppmannsdorf, 1885, *Stapff* s.n. (Z); Rheinpfalz, VI. 1929, *Dinter* 6413 (B, BH, D, K, N, S, St); Klinghardtgebirge, IX. 1922, *Dinter* 3944 (BH, N); do., VIII. 1913, *Schäfer* 530 (B); Obib, VIII. 1908, *Range* 589 (B).

CAPE PROVINCE.

Little Namaqualand distr.: At the mouth of the Orange River, X. 1830, *Drège* (727) (B, BM, G, K, N, O, P, S, V); Groot Derm, X. 1926, *Pillans* 5274 (BH, K); between Arris Drift and Anisfontein, X. 1926, *Pillans* 5245 (BH, N); Zilverfontein, *Drège* 2040 (B).

TYPE SPECIMEN.

Drège 2040 is deposited in the Botanisches Museum, Berlin-Dahlem.

16. *A. subacaulis* (Nees) Steud. Nomencl. Bot. ed. 2. 1. 132 (1842); Trin. et Rupr. Spec. Gram. Stip. 171 (1842); Walp. Ann. Bot. 3. 750 (1852); Steud. Syn. Pl. Glum. 1. 144 (1854); Dur. et Schinz, Consp. 5. 809 (1894); Hack. in Bull. Herb. Boiss. 4. Append. III. 19 (1896) pro parte; Stapf in Dyer, Fl. Cap. 7. 568 (1899) pro parte; Dinter in Fedde, Rep. 15. 343 (1918) pro parte; Garabedian in Ann. S. Afr. Mus. 16. II. 405 (1925) pro parte; Henrard Crit. Rev. 3. 601 (1928); Henrard Monogr. 1. 71 cum ic. tab. 18 (1929); Range in Fedde, Rep. 33. 10 (1933); Theron in Fedde, Rep. 40. 29 (1936).

Arthratherum subacaulis Nees, Fl. Afr. Austr. 180 (1841).

Annual, in small compact tufts, including the culms and awns up to 10.0 cm. high, but usually very much smaller. *Culms* minutely hairy, sheathed all along. *Sheaths* loose, the lowermost bladeless and resembling striate membranous scales, the upper markedly striate, scabrid above and with broad membranous margins; *ligule* a small ciliate rim, auricles bearded, collar smooth; *blades* fairly short, setaceously convolute, up to 3 cm. long, about 1 mm. wide when expanded, strongly striate, asperulous on both surfaces, acute, sub-rigid, more or less curved. *Panicle* few-flowered, much reduced, contracted, almost hidden by the radical leaves, usually somewhat sheathed by the uppermost leaf and sub-exserted; rachis and branches hispidulous; pedicels short, hispidulous or more or less pilose at the clavate tip. *Spikelets* whitish, erect. *Glumes* linear-lanceolate, acuminate, both 3-nerved, membranous, lateral nerves about half the length of the midrib, the latter slightly scabrous towards the apex; the lower 10–13 mm. long; the upper 8–10 mm. long. *Lemma* including the callus 3–4 mm. long, lanceolate-ovate, smooth and glabrous; *callus* very acute, about \pm 1 mm. long, long-hairy; length of column of awn extremely variable (even in one and the same plant), 1–13 mm. long (spikelets near the base of the panicle have shorter columns than those situated nearer the apex), twisted; central awn plumose, slightly hairy at the base, scaberulous in lower part, plumose above the middle to the very tip, up to 4.3 cm. long; lateral awns very fine, up to 1.8 cm. long. *Anthers* 4 mm. long.

SOUTH WEST AFRICA

Spitzkopje, I. 1937, *Boss* TM. 36368 (N, T); Richthofen, IV. 1913, *Engler* 6072 (B, K); Swakopmund, V. 1937, *Boss* TM. 36316 et 36317 (T); Arandis, I. 1937, *Boss* TM. 36395

pro parte (N, T); Welwitsch, I. 1907, *Galpin et Pearson* 7466 (BH, K, N, P, S); Walfishbay, *Nachtigal* 6 (B); Haalenberg, IV. 1929, *Dinter* 6301 (B, BH, D, G, K, N, S, St); Lüderitzbucht (Angra Pequena), X. 1884, *Schinz* 666 pro parte (Z); do. *Schinz* s.n. (V); do., XI. 1884, *Schenck* 32 (N); Klinghardtgebirge, VIII. 1913, *Schäfer* 528 (B); Namib, *Range* 1131 (B, W).

CAPE PROVINCE.

Little Namaqualand distr.: Near the mouth of the Orange River, X. 1926, *Pillans* 5607 (BH, K, N); Verleptpram, IX. 1830, *Drège* (2541) (B, BM, G, K, N, O, P, S, V); Richtersveld, near Arris Drift, IX. 1925, *Marloth* 12394 (N, St) et VIII. 1925, *Marloth* 12394a (N); do., VII. 1925, *Meyer* in Hb. Stell. 9056 (St).

TYPE SPECIMEN.

Drège from Verleptpram is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAME.

Muis-gras.

REMARKS.

The length of the column of the awn varies considerably, even in one and the same gathering. In *Dinter* 4104 it may be 4–13 mm., in *Dinter* 6301 from 5–10·5 mm., whereas in *Schenck* 32 it is only about 1 mm. long. In this species the length of the column is thus hardly of any taxonomic value.

17. **A. Hermannii** Mez in Fedde, Rep. **17**. 153 (1921); Garabedian in Ann. S. Afr. Mus **16**. II. 402 (1925); Henrard Crit. Rev. **2**. 225 (1927); Henrard Monogr. **1**. 73 cum ic tab. 18 (1929); Theron in Fedde, Rep. **40**. 31 (1936).

A. Hermannii Mez var. *hereroensis* Henrard Crit. Rev. **2**. 226 (1927); Henrard Monogr. **1**. 73 (1929). *A. subcaulis* (Nees) Steud. sec. Stapf in Dyer, Fl. Cap. **7**. 568 (1899); Hack. in Bull. Herb. Boiss. **4**. Append. III. 19 (1896); Dinter in Fedde, Rep. **15**. 343 (1918); omnes pro parte, non (Nees) Steud.

Annual, laxly caespitose, up to 15 cm. high including the awns. Sterile innovations absent. *Culms* geniculately-ascending, 2–4-noded. Internodes subterete or angular, striate, densely but minutely pubescent, exserted, the upper included. Lower *leaf-sheaths* densely aggregated, loose, white and papery, about 1 cm. long, keeled, densely striate and hirtellous, especially on the nerves, margins shortly pilose or ciliolate, broad and hyaline; upper leaf-sheaths much longer, up to 5 cm. long, very broad, inflated, loosely enveloping the internodes or part of the inflorescence, margins less ciliate, hyaline, striate and minutely scaberulous; *ligule* a ciliolate rim; auricles bearded; collar constricted; *blades* of all the leaves much reduced; the lower spirally curved and twisted, scabrous-hirtellous on both surfaces, 1–2 cm. long, about 1 mm. wide at the base or somewhat broader, apex subobtusate; the upper curved or straight and scarcely 1·5 cm. long, convolute, much narrower than the sheaths. *Panicle* scarcely exserted, partly sheathed by the uppermost sheath, ovate-oblong, dense, up to 8 cm. long including the awns; axis striate, subterete, scabrous-hirtellous; branches short, solitary, divided nearly from the base; branchlets fascicled, short; pedicels scabrous, axils pubescent, thickened towards the apex, shorter than the glumes. *Spikelets* pallid. *Glumes* narrowly lanceolate, acute, shortly awned 3-nerved, almost hyaline; the lower 9–11·5 mm. long, densely but minutely scaberulous on the outer surface; the upper 8–10 mm. long, glabrous at the base but minutely scaberulous towards the apex. *Lemma* punctulate-scabrous under a strong lens, including the callus 3·5–4 mm. long, linear-tubulous with a somewhat oblique articulation, apex minutely bi-lobed; *callus* acute, densely hairy, about 1–1·25 mm. long; column of awns very scabrous, twisted, pubescent at and below the branching point, extremely variable in length, from 1–10·5 mm. long even on the same specimens; central awn scabrous in the lower third, plumose above, the tip sometimes slightly exserted but more usually not acute to subobtusate in outline, 2–4·0 cm. long; lateral awns naked, very fine, 1–1·5 cm. long. *Anthers* ± 2 mm. long.

ANGOLA.

Between Mossamedes and R. Coroca, IV. 1909, *Pearson* 2265 (K, N, P, Z); Mossamedes, behind the town, IV. 1909, *Pearson* 2286 (K, N).

SOUTH WEST AFRICA.

Arandis, I. 1937, *Boss* TM. 36395 pro parte (T); between Swakopmund and Walfishbay, *Boss* TM. 36439 (N, T); Lüderitzbucht (Angra Pequena), X. 1884, *Schinz* 665 et 666 (Z); do., XI. 1884, *Schenck* 32 (N, Z); do., *Schenck* s.n. (V); do., XI. 1889, *Hermann* 42 (B); Pomona, V. 1929, *Dinter* 6344 (BH, N) et *Dinter* 6396 (B, BH, D, G, K, N, S, St); Hereroland, *Nels* s.n. (V).

TYPE SPECIMEN.

Hermann 42 is deposited in the Botanisches Museum, Berlin-Dahlem.

REMARKS.

In this species the column of the awn is extremely variable as to its length. *Dinter* 6344 has spikelets in which the column is only 1 mm. long, whereas in *Pearson* 2265 the column varies from 3–10.5 mm. in length.

18. **A. geminifolia** (*Nees*) *Trin. et Rupr.* Spec. Gram. Stip. 169 (1842); Walp. Ann. Bot. 3. 749 (1852); Steud. Syn. Pl. Glum. 1. 144 (1854) [sphalm. geminiflora]; Dur. et Schinz, Consp. 5. 803 (1894); Stapf in Dyer, Fl. Cap. 7. 570 (1899); Dinter in Fedde, Rep. 15. 341 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 402 (1925) pro parte; Henrard Crit. Rev. 1. 194 (1926); Henrard Monogr. 1. 66 cum ic. tab. 16 (1929); Range in Fedde, Rep. 33. 8 (1933); Theron in Fedde, Rep. 40. 26 (1936) [sphalm. geminiflora].

Stipagrostis geminifolia Nees, Fl. Afr. Austr. 173 (1841); Presl, Bot. Bemerk. 121 (1844).

Perennial, densely caespitose, branched from the base, almost suffrutescent, up to 25 cm. high including the awns. *Culms* erect or ascending, slender, glabrous or hairy below the panicle, rather few-noded, simple, terete, striate; internodes very unequal, markedly striate; the lower short, sheathed, included; the following long exserted, up to 12 cm. long; the next short to very short, 5–20 mm. long, enclosed or exserted; the last slightly longer or equalling the former in length and usually shortly exserted, often geniculate. Innovations intravaginal with a similar alternation of short and long internodes; nodes bearded or becoming glabrous with age. *Leaves* crowded near the base, the uppermost again approximate, sometimes subopposite; sheaths short, striate with much reduced leaf-blades, the lower tight and parched, glabrous, with woolly or ciliate margins, the upper less tight and almost spathe-like, sometimes slightly hirsute with tubercle-based hairs; *ligule* a ciliolate rim; auricles bearded; collar glabrous; blades short, almost rudimentary, subulate, involute, subpungent, 3–10 mm. long, rarely longer, very rigid and divaricately spreading, striate and glabrous below, pubescent on the upper surface. *Panicle* sub-erect or somewhat nodding, very short, spike-like and often secund, including the awns up to 4 cm. long and 2.5 cm. broad; rachis glabrous or hairy; branched from near the base; branches hairy; pedicels hairy, very short, almost sessile. *Spikelets* crowded and congested yellowish-brown and tinged with purple. *Glumes* unequal, linear-lanceolate, acuminate, long-awned, the tips of both convolute and slightly bifid, but the setulae inconspicuous; the lower 8–12 mm. long, hirsute all over, manifestly 3-nerved; the upper 10–12 mm. long, narrower, more or less glabrous at the base, hirsute above, 1–3-nerved. *Lemma* including the callus 4–6 mm. long, linear-oblong, smooth, pale or purplish, minutely bilobed; *callus* about 1.5 mm. long, very acute, densely hairy; column of awn 1–2 mm. long, slightly twisted; central awn spreading, 18–30 mm. long, plumose, lower part shortly hairy, upper part long feathery to the very tip, obtuse in outline; lateral awns naked, up to 15 mm. long. *Pale* emarginate, 2-nerved, 1 mm. long. *Anthers* 3–4 mm. long.

SOUTH WEST AFRICA.

Namib, Kuos, IX. 1913, *Range* 1874 (B); Haalenberg, X. 1922, *Dinter* 4099 (B, BH, N, Z); Lüderitzbucht, VII. 1922, *Dinter* 3829 (BH, N); Pomona, V. 1927, *Dinter* 6365 (B, BH, D, G, K, N, S, St); Zwischen Prinzenbucht und Bogenfels, IX. 1912, *Schäfer* 587 (B); near Bogenfels, VIII. 1911, *Marloth* 12987 (N); Buntfeldschuh, VII. 1913, *Schäfer* 524 (B); Obib, VIII. 1908, *Range* 586 (B); without precise locality, *Kuhn* s.n. (B).

CAPE PROVINCE.

Little Namaqualand distr.: At the mouth of the Orange River, *Drège* (B, BM, G, N, O, S); between Kaus, Natvoet and Doornpoort, *Drège* (B, P, V); near Orange River mouth, X. 1926, *Pillans* 5606 (BH, K, N); Richtersveld, IX. 1925, *Marloth* 12415 (N, St).

TYPE SPECIMEN.

Drège 2561 is deposited in the Botanisches Museum, Berlin-Dahlem.

19. *A. fastigiata* Hack. *apud* Schinz in Bull. Herb. Boiss. Ser. II. 1. 768 (1901); *Dinter* in Fedde, Rep. 15. 341 (1918); Henrard Crit. Rev. 1. 175 (1926); Henrard Monogr. 1. 67 cum ic. tab. 15 (1929); Theron in Fedde, Rep. 40. 27 (1936).

A. geminifolia (Nees) Trin. et Rupr. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915); Garabedian in Ann. S. Afr. Mus. 16. II. 402 (1925) omnes pro parte, non (Nees) Trin. et Rupr.

Perennial, fairly densely caespitose, with a much-branched thick rhizome. *Culms* arising in fascicles at intervals from the rhizome, elegant, erect or somewhat geniculately ascending, 4-5-noded, up to 35 cm. high, sheathed all along, simple, terete; internodes more or less equal in length, exserted, only slightly striate, laterally sulcate, somewhat scaberulous; nodes annular, densely bearded with long spreading white hairs. *Leaf-sheaths* (except the lowermost) much shorter than the internodes, terete, tight, striate, only slightly scabrous, with ciliate margins; *ligule* a shortly ciliate rim; auricles densely divaricately bearded; collar glabrous; blades linear-lanceolate, acute, gradually narrowed into a setaceous point, more or less curved, flat at the base and 2-3 mm. wide, convolute upwards, up to 12 cm. long, but usually much shorter, many-nerved, margins not thickened, scaberulous beneath, pubescent or densely hirtellous on the upper surface. *Panicle* well-exserted, more rarely sheathed by the uppermost leaf, slightly nodding or erect, more or less obovate, dense, few to many-flowered, subsecund and subfastigiate, including the awns up to 8 cm. long; axis striate, scaberulous; branches scabrous, solitary, scarcely 5 mm. long, bearded in the axils; pedicels very short, hairy. *Spikelets* congested, greenish-white, often darker (brown) at the base. *Glumes* unequal, 3-nerved, hairy all over, the tips more or less glabrescent; the lower 10-14 mm. long, acute; the upper 14-18 mm. long, acuminate, with a minutely bifid apex and inrolled tips. *Lemma* oblong, smooth, bilobed at the apex, 5-5.5 mm. long including the callus; *callus* 1.5-2 mm. long, densely hairy, very acute; central awn 3-3.5 cm. long, feathery all over, obtuse in outline; lateral awns naked, 1-2 cm. long. *Anthers* 5 mm. long.

SOUTH WEST AFRICA.

Namib, VI. 1936, *Boss* TM. 36148 (K, N, T); 12 km. west of Sandverhaar, II. 1909, *Pearson* 4600 (A, BH, BM, D, K, N, S); Inachab, XI. 1898, *Dinter* 1102 (B, N, V, W, Z); between Kalkfontein and Nakob, I. 1916, *Pearson* 9709 (BH, K, S).

TYPE SPECIMEN.

Dinter 1102 is deposited in the Botanisches Museum, Zürich.

REMARKS.

This species is closely related to *A. geminifolia* but is characterised by having the internodes more uniform in length and well-developed leaf-blades. In *A. geminifolia* the upper two leaf-sheaths are approximate and leaf-blades are almost totally wanting; the spikelets are more robust and larger than in *A. fastigiata*.

20. **A. hirtigluma** Steud. ex Trin. et Rupr. Spec. Gram. Stip. 171 (1842); Steud. Nomencl. Bot. ed. 2. 131 (1841) nomen tantum; Hack. in Bull. Herb. Boiss. 4. Append. III. 18 (1896); Henrard Monogr. 1. 68 cum ic. tab. 15 (1929).

Arthratherum ciliatum Nees, Fl. Afr. Austr. 182 (1841) excl. syn.

Delicate annual, caespitose. Culms up to 40 cm. long, 2-4-noded, glabrous; internodes terete and striate, usually scaberulous; nodes glabrous. Leaf-sheaths shorter than the internodes, striate, scabrous, somewhat compressed; ligule shortly ciliate; auricles long-bearded; collar glabrous; blades 6-15 cm. long, setaceous, convolute, scaberulous on the lower surface, upper surface somewhat hairy, especially towards the ligule. Spikelets pale, hirtellous. Glumes unequal to subequal; the lower up to 6 mm. long, ciliate dorsally; the upper up to 10 mm. long, dorsally ciliate. Lemma including the callus up to 4 mm. long or slightly longer, tuberculate; callus long and sharp, somewhat oblique; column of awns up to 10 mm. long, hairy or glabrous; central awn very long (up to 5-7 cm.), feathery with a naked excurrent tip; lateral awns about 1-1.5 cm. long.

ANGOLA.

Loanda, Gossweiler 4943 (K, N).

SOUTH WEST AFRICA.

Rehoboth, VI. 1889, Fleck 802 (V, Z). Bethanie, IV. 1933, Van Son TM. 31827 (T); Usakos, XII. 1938, Volk 150 (D).

TYPE SPECIMEN.

Schimper 165 is deposited in the Botanisches Museum, Berlin-Dahlem.

21. **A. gracilior** Pilger in Engl. Bot. Jahrb. 40. 80 (1907); Dinter in Fedde, Rep. 15. 341 (1918); Henrard Crit. Rev. 1. 208 (1926); Henrard Monogr. 1. 69 cum ic. tab. 15 (1929).

A. hirtigluma Steud. var. *patula* Hack. in Denkschr. Kais. Akad. Wiss. Wien, Math.—Naturw. Kl. 78. 401 (1906). *A. hochstetteriana* Beck ex Hack. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte, non Beck. *A. uniplumis* Licht. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte, non Licht.

Perennial, erect, caespitose. Culms up to 100 cm. high including the panicle, frequently much smaller, 4-5-noded, at times branched upwards. Internodes terete, striate, glabrous but scaberulous along the nerves, exserted; nodes glabrous, somewhat swollen. Leaf-sheaths shorter than the internodes, tight or somewhat lax upwards, subcompressed, striate and asperulous; ligule a short ciliate rim; auricles erect or more or less flexuous or curved, narrow, convolute, filiform, acuminate, asperulous and grooved below, upper surface scaberulous to hirtellous, up to 20 cm. long or more. Panicle lax, ovate in outline, up to 30 cm. long and 20 cm. wide; axis terete, angular and asperulous upwards; branches thin, elongate, solitary, often divided from near the base, scabrous; pedicels capillary, much thickened towards the apex. Spikelets pale yellow to green or purple-brown. Glumes unequal, subacute, more or less shortly awned, hirtellous; the lower 9-11 mm. long; the upper 10-13 mm. long. Lemma including the callus about 3.5 mm. long, becoming very dark at maturity, tuberculate-asperulous upwards; callus 0.5-0.75 mm. long, curved, acute, densely bearded; column of awns 7-11 mm. long, hairy upwards; central awn up to 5.5 cm. long, plumose except for the naked tip; lateral awns up to 25 mm. long. Anthers 4-5 mm. long.

SOUTH WEST AFRICA.

Onolongo, Barnard 42 (S); Klein Namutoni, I. 1919, Breyer TM. 20614 (T); between Klein Otavi and Okorosawe, III. 1926, Barnard (S); Grootfontein, IV. 1916, Waibel 100 (B); do., I. 1936, Boss TM. 35691 (T); Otavi, I. 1936, Von Malzahn TM. 35560 (T); Outjo, V. 1933, ter Horst TM. 31843 (T); Waterberg, I. 1937, Boss TM. 36456 (T); Omaruru,

XII. 1935, *Boss* TM. 35670 (T); Okahandja, II. 1928, *Bradfield* 268 pro parte (T); Granitbank bei Ebony, V. 1936, *Boss* TM. 36191 (T, K); Welwitsch, Khan River basin, III. 1909, *Pearson* 4468 (K); Walfishbay, IX. 1925, *de Wildeman* (K); Mount Brukkaros, III. 1931, *Sordahl* 26 (W); Sandverhaar, II. 1909, *Pearson* 4673 (K); between Keetmanshoop and Seeheim, II. 1909, *Pearson* 4673 (BH, K); Tsurub, V. 1936, *Boss* TM. 36229 (T); Klein Karas, IV. 1931; *Oertendahl* 140 (N); Karas Mountains, *Boss* TM. 36126 (T); without precise locality, *Empire Exhibition* 29 (K, W); Bumbo, im Walde, IV. 1903, *Fritzsche* 16 (B, G, N, V); Hairabib, IV. 1939, *Volk* 485 (D); Ossa, III. 1939, *Volk* 1531 (D).

BECHUANALAND PROTECTORATE.

Makarikari Lake, IV. 1931, *Pole Evans* 3274 et 3284 (K, N); Francistown, V. 1929, *Gordon* 146 (N); between Francistown and Shashi, IV. 1931, *Pole Evans* 3224 (K, N),

CAPE PROVINCE.

Little Namaqualand, Koa Vallei, Aggeneys, I. 1909, *Pearson* 4953 (K).

TYPE SPECIMEN.

Fritzsche 16 is deposited in the Botanisches Museum, Berlin-Dahlem.

ECONOMIC NOTE.

Collectors from South West Africa state that this species is a good fodder for stock.

21a. **A. gracilior** *Pilger* var. *intermedia* *mihl*,

a typo columna apice penicillata et arista media basin versus nuda differt.

SOUTH WEST AFRICA.

Keetmanshoop, IV. 1931, *Oertendahl* 158 (K, N); Damaraland, I. 1907, *Galpin et Pearson* 7402 (K, N).

TYPE SPECIMEN.

Galpin et Pearson 7402 is deposited in the Herbarium, Royal Bot. Gardens, Kew.

The facies of this variety is identical with that of the species but may be distinguished by the penicillate branching point of the awn (as in *A. uniplumis* Licht.) and the naked column.

21b. **A. gracilior** *Pilger* var. *Pearsonii* *Henrard* Crit. Rev. 3. 695 (1938); *Henrard Monogr.* 1. 69 (1929).

ANGOLA.

Between Mossamedes and R. Coroca, IV. 1909, *Pearson* 2249 (K, N); about 100 km. from Mossamedes, IV. 1909, *Pearson* 2395 (K); Cautas on Mossamedes Railway, IV. 1909, *Pearson* 2361 (K).

SOUTH WEST AFRICA.

Grootfontein, II. 1933, *Schoenfelder* 70 (K, N); Narebis, *Barnard* SAM. 16479-80 (K, S); Spitzkopje, I. 1937, *Boss* TM. 36357 (T) et 36371 (T) et 36374 (T); Arandis, I. 1937, *Boss* TM. 36396 (T).

TYPE SPECIMEN.

Pearson 2249 is deposited in The Herbarium, Royal Bot. Gardens, Kew.

The facies of this variety resembles that of the species but may be recognised by the naked column and the absence of a pencil of hairs at the branching-point of the awns.

22. *A. obtusa* Del. Fl. Aegypt. 31 tab. 13 fig. 3 (1813); Trin. Spec. Gram. Stip. 167 (1842); Walp. Ann. Bot. 3. 749 (1852) excl. syn. pro parte; Steud. Syn. Pl. Glum. 1. 144 (1854); Dur. et Schinz, Consp. 5. 805 (1894); Stapf in Dyer, Fl. Cap. 7. 567 (1899) excl. syn. pro parte; F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915) pro parte; Marloth, Fl. S. Africa 4. 22 tab. 7 fig. A 1-4 (1915); Dinter in Fedde, Rep. 15. 342 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 403 (1925) pro parte; Henrard Crit. Rev. 2. 387 (1927); Henrard Monogr. 1. 72 cum ic. tab. 17 (1929); Range in Fedde, Rep. 33. 9 (1933).
- A. brevifolia* Steud. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte, non Steud. *A. ciliata* Desf. sec. Stapf in Dyer, Fl. Cap. 7. 564 (1899) pro parte, non Desf. *A. Dregeana* (Nees) Trin. et Rupr. sec. Hack. in Bull. Herb. Boiss. 4. Append. III. 18 (1896); Stapf in Dyer, Fl. Cap. 7. 570 (1899); Dinter in Fedde, Rep. 15. 341 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925) omnes pro parte, non (Nees) Trin. et Rupr. *A. uniplumis* Licht. sec. Hack. in Bull. Herb. Boiss. 4. Append. III. 19 (1896) pro parte, non Licht. *A. sp.* sec. Bolus in Ann. S. Afr. Mus. 9. IV. 235 (1915). *Arthratherum obtusum* (Del.) Nees, Fl. Afr. Austr. 179 (1841); Presl, Bot. Bemerk. 121 (1844). *Stipagrostis capensis* Nees in Linnaea 7. 291 (1832); Kunth Enum. 1. 197 (1833); Nees, Fl. Afr. Austr. 171 (1841). *Stipagrostis obtusa* Nees in Linnaea 7. 293 (1832); Kunth Enum. 1. 198 (1833).

Perennial, compactly caespitose. Innovations numerous. *Culms* from a few centimetres up to 50 cm. high, very slender, 1-noded, glabrous, smooth, erect or geniculate at the nodes; internodes exserted. Lower *leaf-sheaths* short, firm and persistent, glabrous or woolly near the margin, with more or less reduced blades; the upper much shorter than the internode, tight, striate, often somewhat compressed, with hyaline margins, some times lightly villous; *ligule* a short ciliolate rim; auricles densely and often very long-bearded; collar smooth; blades very variable with regard to length, 1.5-20 cm. long, setaceous, convolute, rigid or subrigid, curved or flexuous, glaucous, striate, glabrous or lightly villous or scaberulous beneath, minutely villous or hirtellous on the upper surface, scarcely 0.5 mm. wide when expanded, terminating in a callus-like obtuse tip. *Panicle* very narrow, erect, contracted, but rather loose and interrupted at the base, 2.5-20 cm. long; axis terete or striate, glabrous or scaberulous upwards; branches solitary, bipartite nearly from the base, filiform, erect or somewhat spreading; branchlets scaberulous, axils glabrous; lateral pedicels short, always shorter than the glumes. *Spikelets* yellow, often flushed with purple at the base. *Glumes* sub-equal, *scaberulous dorsally with numerous rows of fine protuberances*; the lower lanceolate, obtuse, 3-nerved, scabrous on the keel, usually exceeding the upper glume in length, 8.5-12 mm. long; the upper narrowly-lanceolate, subacute, 1-3-nerved, smooth on the keel, 8-11 mm. long. *Lemma* oblong, about 3 mm. long including the callus, smooth; *callus* nearly 1 mm. long, acute, densely hairy; column of awns variable in length, 4-10 mm. long, straight or twisted; central awn scaberulous in lower half, densely plumose in upper part up to the very tip, about 2-3.2 cm. long; lateral awns naked, very fine, divaricate, 0.75-1.75 cm. long. *Pale* nerveless, broad, \pm 1 mm. long. *Anthers* 4-5 mm. long.

SOUTH WEST AFRICA.

Spitzkopje, I. 1937, *Boss* TM. 36376 (T); Arandis, I. 1937, *Boss* TM. 36397 (T); Welwitsch, I. 1907, *Galpin et Pearson* 7415 (BH, K, N, P, S); Haigamkhab, I. 1907, *Galpin et Pearson* 7424 (K, N, S); Usakos, anno 1938, *Volk* 73 (D); Rössingberge, XI. 1938, *Volk* 23a (D); Witvley, *Range* 1422 (B); between Choaberib and Gurumanas, I. 1916, *Pearson* 9598 (BH, K, S); Kwartel, IV. 1911, *Dinter* 2166 et 2171 (B); Narib, IV. 1913, *Engler* 6533 (B); Tsumis, III. 1905, *Von Trotha* 15b (B); Sendlingsgrab, I. 1908, *Hartmann* 17a (B); Gamkanas, III. 1911, *Dinter* 2001 (B); Lidfontein, III. 1911, *Dinter* 1999 (B); Bullspporter Fläche, *Dinter* 2137 (B, W); between Gamis and Bull's Mouth Pass, XII. 1915, *Pearson* 8939 (K, S); Chamisfläche, IX. 1905, *Schultze* 414 (B); Gelwater, X. 1907, *Hartmann* 17 (B); between Achterfontein and Gelwater, XII. 1915, *Pearson* 9229 (K); 20 km. south of Gründoorn, II. 1909, *Pearson* 3158 (K); between Ausis and Khuias, III. 1885, *Schenck* 219 (Z); Haalenberg, IV. 1929, *Dinter* 6303 (B, BH, K, St); Keetmanshoop, *Seidel* 2 (B); Lüderitzbucht (Angra Pequena), *Marloth* 5084b (N); do., VII. 1925, *Moss* 11516 pro parte (WR); Garub, I. 1910, *Dinter* 1056 (B); do., *Range* 523 (B); do., II.

1909, *Pearson* 4197 (K, S); Aus, III. 1885, *Schinz* 659 (B, K, Z); do., *Peyer* 26 (Z); do., *Marloth* 5084 (N, St); near Kubib, I. 1916, *Pearson* 9472 [an 9492 ?] (K, S) et 9476 (K); Kubub, *Range* 234 (B); Schakalskuppe, *Range* 1780 (B); do., II. 1909, *Pearson* 4804 (BH, K, N) et 4778 (A, BM, K, S); Buchholzbrunn, II. 1909, *Pearson* 3639 (K, Mc); Feldschuhhorn, IV. 1909, *Schäfer* 105 (B); Sandverhaar, II. 1909, *Pearson* 4663 (K); do., *Pearson* 4676 (D, K, N); do., *Pearson* 4688 (A, K); Kaukausib, *Range* 1133 et 1897 (B); Inachab, XII. 1897, *Dinter* 1109 (B, V, Z); Klein Karas, IV. 1931, *Oertendahl* 119 (N); do., VII. 1931, *Oertendahl* 563 (B); do., IX. 1923, *Dinter* 4952 (B, BH, G, K, Mc, N, S, Z); Pomona, *Marloth* 6595 (N); Holoog, I. 1916, *Pearson* 9725 (BH, K, S); Kraaikluft, XII. 1912, *Pearson* 8494 (A, BH, BM, K, N, S); Klinghardtgebirge, VIII. 1913, *Schäfer* 542-545 et 547 [omnes B]; Witpütz, *Range* 587 et 713 (B); Narudas Süd, XII. 1912, *Pearson* 8146 (BH, K); Ganus, II. 1909, *Pearson* 4504 (K); Aiais-plateau, V. 1919, *Waibel* 203 (B); Gabis, I. 1909, *Pearson* 4322 (K, N); 25 km. north of Warmbad, II. 1909, *Pearson* 4292 (K, W, Z); Dabaigabis, I. 1909, *Pearson* 4382 (D, K, N); Hohenfels, *Pfeil* 184 (B); near Raman's Drift, I. 1909, *Pearson* 4009 (A, BH, BM, K, N, S); do., *Pearson* 4053 (A, BH, K, S); north of Viols Drift, IX. 1931, *Pillans* 6396 (BH); without precise locality: Hereroland, *Lüderitz* 64 et 68 (B, Z); Namib, *Morgenstern* s.n. (B).

CAPE PROVINCE.

Little Namaqualand distr.: South of Orange River mouth, IX. 1926, *Pillans* 5707 (BH, K); south of Viols Drift, III. 1935, *Thorne* SAM. 51590 (S); Richtersveld, VIII. 1925, *Marloth* 12223 (N); between Holgat River and Orange River, *Drège* 2542 (B, K, N, S); Goodhouse, IX. 1930, *Henrici* 2195 (N); Lekkersing, IX. 1935, *Taylor* 1095 (N); Steinkopf, V. 1926, *Krapohl* H. 21862 (B, N) et *Marloth* 11222 (N) et *Marloth* 3719 (N); Kraaiwater, II. 1898, *Schlechter* 64 (A, B, BH, G, K, N, P, T, V, W, Z); Windhoek, VII. 1896, *Schlechter* 8343 (A, B, BH, BM, G, K, N, P, T, V, W, Z); Koeris Camp, X. 1928, *Pole Evans* 2238 (N); between Klipfontein and Abbevlakte, *Bolus* 9468 (BH); Buffelsriver, IX. 1897, *Schlechter* 11254 (A, B, BH, BM, G, K, N, P, T, V, W, Z); near Kamabies, XII. 1908, *Pearson* 3777 (K); near Bitterfontein, XII. 1908, *Pearson* 3866 (K); Ius, IX. 1897, *Schlechter* 11405 (A, B, BH, BM, G, K, N, P, Z); south of Daunabis, XII. 1910, *Pearson* 6006 (A, K, S); Alewysfontein, XII. 1908, *Pearson* 3334 (BM). Van Rhynsdorp distr.: Bitterfontein, XII. 1908, *Pearson* 3406 (N, T). Calvinia distr.: Between Lospers Plaats and Springbokkuil River, *Zeyher* 1815 (A, B, BH, BM, G, K, P, S, V, Z); Brakrivier, XII. 1908, *Pearson* 3902 (BH, K); between Pappekuul and Stompiesfontein, XII. 1908, *Pearson* 4965 (K). Ceres distr.: Rietpoort, *Rehmann* 3266 (Z); Gansfontein, XII. 1908, *Pearson* 3987 (K). Sutherland distr.: Tanqua Karroo, IX. 1935, *Levy's* 5087 (U). Laingsburg distr.: Ngaap Kop, IX. 1926, *Compton* 3140 (BH). Prince Albert distr.: Prince Albert Road, I. 1903, *Marloth* 3055 (N); do., V. 1920, *Pillans* BH. 21798 (BH); Boterkraal, XI. 1905, *Bolus* 12431 (A, B, BH, BM, K, N); Beaufort West distr.: Nieuweveld, Bokpoort, *Drège* (B, G, K, N, P, S, V). Murraysburg distr.: Murraysburg, VIII. 1879, *Tyson* 526 (D). Graaff-Reinet distr.: Graaff-Reinet, IV. 1911, *Pillans* 1812 (K). Victoria West distr.: Victoria West, XI. 1923, *Marloth* 3075 (N). Carnarvon distr.: Carnarvon, IX. 1925, *Gill* 215 (St); Karreebergen Poort, IX. 1811, *Burchell* 1556 (G, K). Fraserburg distr.: Williston, XI. 1921, *Foley* 188 (N); between Patrysfontein and Great Brak River, *Burchell* 1520 (K, P); between Great Riet River and Stinkfontein, VIII. 1811, *Burchell* 1392 (G, K, N, P); Fraserburg, II. 1930, *Nel* in Hb. Stell. 15842 (St). Kenhardt distr.: Loog Kolk, X. 1928, *Pole Evans* 2237 (N); Louisvale, II. 1930, *Mennell* s.n. (W). Prieska distr.: Prieska, III. 1931, Bryant 608 (B, K, V, W); Redlands Siding, IV. 1913, *Crews* GH. 9071 (N). Philipstown distr.: Potfontein, III. 1933, *Schweickerdt* 1205 (N). Herbert distr.: Honeyestkloof, III. 1920, *Wilman* K. 2 (B, K); do., V. 1921, *Wilman* 2153 (Mc) do., XI. 1929, *Phillips* 3466 (K, N, W). Kimberley distr.: Modderriver Station, II. 1904 *Kuntze* s.n. (K); Riverton, IV. 1928, *Wilman* 2923 (Mc); Kimberley, *Rehmann* 3469 (Z) et *Tuck* s.n. (K, S). Hay distr.: Niekerk's Hoop, X. 1936, *Hafstrom* 1150 (Mc); Griquatown, II. 1937, *Wilman* s.n. (K, Mc). Gordonia distr.: Upington, IX. 1919, *Shantz* 184 (K, W); Brak River, VII. 1925, *Barnard* SAM. 36144 (S). Kuruman distr.: Kuruman,

III. 1928, *Pole Evans* 2089 (N). Vryburg distr.: Armadillo Creek, V. 1912, *Burt Davy* 13862 (N). Mafeking distr.: Inkruij, IV. 1929, *Pole Evans* 2422 (K, N); Kameelboom Camp, IV. 1929, *Pole Evans* 2405 (K, N).

ORANGE FREE STATE.

Fauresmith distr.: Jagersfontein, VI. 1927, *Smith* 4114 (K); Fauresmith, I. 1925, *Pole Evans* 1572 (N); Luckhoff, I. 1917, *Pole Evans* H. 135711 (N). Bloemfontein distr.: Pont 948 (Z); without precise locality: Olifantsfontein, *Rehmann* 3525 (B, K, V, Z).

TYPE SPECIMEN.

The type is deposited in the Institut de Botanique, University of Montpellier, France.

COMMON NAMES.

Beesgras. Bushman Grass. Fyne Twaagras. Gemsbokgras. Klein Twaagras. Klip Toagras. Small Bushman grass. Toagras(s). Twaagras.

ECONOMIC NOTES.

Many collectors report that this species is a good fodder for all kinds of stock and in some parts of South West Africa is one of the most important pasture grasses. It is very tough and lasts well (persists).

23. *A. brevifolia* (Nees) Steud. Nomencl. Bot. ed. 2. 130 (1842); Trin et Rupr. Spec. Gram; Stip. 170 (1842); Walp. Ann. Bot. 3. 749 (1852); Steud. Syn. Pl. Glum. 1. 144 (1854); Hack. in Bull. Herb. Boiss. 4. Append. III. 17 (1896); Stapf in Dyer, Fl. Cap. 7. 570 (1899); F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte; Dinter in Fedde, Rep. 15. 341 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925); Henrard Crit. Rev. 1. 58 (1926); Henrard Monogr. 1. 74 cum ic. tab. 17 (1929); Range in Fedde, Rep. 33. 8 (1933); Theron in Fedde, Rep. 40. 12 (1936).

A. geminifolia Trin. et Rupr. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 234 (1915) pro parte, non Trin. et Rupr. *A. obtusa* Del. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 233 (1915) pro parte, non Del. *Arthratherum brevifolium* Nees, Fl. Austr. 183 (1841).

Perennial, suffrutescent, with a much-branched woody rootstock. *Culms* up to 100 cm. high, but usually much shorter, many-noded, erect or ascending, terete, striate, slender, minutely puberulous and covered with many glands; lower internodes short, more or less aggregated, the upper gradually longer and exserted; nodes with an evanescent flake of wool. *Leaf-sheaths* tight; the lower longer or slightly shorter than the internodes, terete, striate, gland-dotted, covered with evanescent wool at the mouth and along the margins, those of the short cylindrical innovations very broad and with rudimentary spiny blades; the upper sheaths much longer, shorter than the internodes, glandular or becoming more or less glabrescent; *ligule* a short ciliate rim; auricles bearded with a flake of wool; collar a more or less pubescent villous line, eventually becoming glabrous; *blades* densely striate, convolute or flat, subpungent, subrigid to very rigid, spreading, glaucous, asperulous beneath, glandular hispidulous or pubescent on the upper surface, up to 12 cm. long but usually much shorter, up to 3 mm. broad. Inflorescence exserted; peduncle terete, striate, puberulous and glandular. *Panicle* contracted, linear, somewhat spike-like but loose and interrupted at the base, up to 20 cm. long including the awns but usually much shorter; rhachis striate, angular, glabrous, here and there dotted with glands; branches short, divided from the base, usually few-flowered, smooth; pedicels shorter or longer than the glumes. *Spikelets* green or yellowish, often tinged with purple. *Glumes* lanceolate, acuminate, minutely truncate, glabrous or puberulous or ciliate near the margins and glandular, unequal; the lower 8–11 (15) mm. long; the upper 11·5–15 (17) mm. long, 3–5-nerved. *Lemma* linear-oblong, smooth, with an obtusely slightly bilobed tip, including the callus 5·5–7 mm. long; *callus* very acute, pungent, up to 2–2·5 mm. long, long-hairy; column twisted, 4–9 mm. long; central awn glabrous or scantily plumose at the base, densely plumose above to the very tip, obtuse in outline, 2·3–4·0 cm. long; lateral awns naked, 1·0–1·8 cm. long. *Anthers* up to 7 mm. long.

SOUTH WEST AFRICA.

Between Keetmanshoop and Seeheim, II. 1909, *Pearson* 4590 (B, BM, BH, K, N); Klein Karas, IX. 1923, *Dinter* 4970 (BH, G, Mc, N, S, St, Z); Klein Karas to Aiais, VII. 1931, *Vertendahl* 575 (K, N); between Fish River and Orange River, XII. 1911, *Range* 1233 (B); Aiais-plateau, V. 1919, *Waibel* 202 (B); between Sjambok River and Aussenkehr, IX. 1931, *Pillans* 6469 (BH); between Modder Drift and Sjambok River, IX. 1931, *Pillans* 6444 (BH); 25 km. north of Warmbad, II. 1909, *Pearson* 4287 (K, WR, Z); 30 km. north of Raman's Drift, I. 1909, *Pearson* 4051 (BH, K, S) et 4010 (A, BH, D, K) et 4535 (K); without precise locality, *Fleck* 290a (V, Z).

CAPE PROVINCE.

Little Namaqualand distr.: Goodhouse, Orange River, IX. 1930, *Henrici* 2152 (N); between Dabainoris and Abbases, I. 1909, *Pearson* 3011 (K, D); Wortel, I. 1909, *Pearson* 3601 (A, BM, K, N, T, S) et 3626 (K) et 3632 (K, N) et 3634 (BM, N); 10 miles north-east of Bitterfontein, XII. 1908, *Pearson* 3405 (A, BM, BH, K, N, S); Silverfontein near Ookiep, X. 1830, *Drège* [2040] (B, G, K, N, O, P, V); near Springbok, XII. 1936, *Adamson* 1538 (K); Buffel Rivier, IX. 1897, *Schlechter* 11255 (A, B, BH, BM, G, K, N, P, T, V, W, Z); near Tweefontein, XII. 1908, *Pearson* 3781 (K); between Klipplaat and Bitterfontein, XII. 1908, *Pearson* 3869 (K); Zabies, XII. 1897, *Schlechter* 47 (A, BH, BM, G, K, N, P, T, V, W, Z); Kamiesberg to mouth of the Orange River, *Zeyher* 73 (A, B, G, K, N, S, Z).
Calvinia distr.: Between Lospers Plaats and Springbokkuil River, *Zeyher* 1813 (A, B, BH, BM, G, K, N, P, St, Z).
Prince Albert distr.: Between Dwyka River and Zwartbulletje, *Drège* (BM, G, K, N, O, P, S, V).
Without precise locality: Prom. bon. Spei, 1862, *Pappe* (BM).

TYPE SPECIMEN.

Drège (lectotype!) is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Bosjes-gras. Twa-gras. T'waagras.

ECONOMIC NOTES.

Drège states that "die Körner dieses Grases werden als Grütze von den Hottentotten sehr geschätzt."

REMARKS.

Pearson 4590 appears to be a large-flowered form of this species. The glumes are fairly large (I = 15 mm., II = 17 mm.) and pubescent towards the margins: the lemma and central awn are longer than in most other specimens seen. In general characters however this gathering agrees well with *A. brevifolia*.

24. **A. uniplumis** Licht. in *Roem. et Schult.*, Syst. Veg. **2**. 401 (1817); Trin. Gram. Unifl. et Sesquifl. 180 (1824); Trin. in Mem. Acad. Imp. Sc. Petersb. **6**. I. 89 (1829); Kunth, Enum. **1**. 195 (1833); Trin. et Rupr. Spec. Gram. Stip. 172 (1842); Walp. Ann. Bot. **3**. 750 (1852); Steud. Syn. Pl. Glum. **1**. 144 (1854); Hack. in Engl. Bot. Jahrb. **11**. 400 (1889); Dur. et Schinz, Consp. **5**. 809 (1894); Hack. in Bull. Herb. Boiss. **4**. Append. III. 19 (1896) pro parte; Stapf in Dyer, Fl. Cap. **7**. 569 (1899) pro parte; F. Bolus in Ann. S. Afr. Mus. **9**. IV. 234 (1915) pro parte; Dinter in Fedde, Rep. **15**. 343 (1918); Garabedian in Ann. S. Afr. Mus. **16**. II. 405 (1925) pro parte; Henrard Crit. Rev. **3**. 643 (1928); Henrard Monogr. **1**. 77 cum ic. tab. 19 (1929); Range in Fedde, Rep. **33**. 10 (1933); Obermeijer, Schweickerdt et Verdoorn in Bothalia, **3**. II. 227 (1937).
A. uniplumis Licht. var. *Neesii* Walp. sec. Garabedian in Ann. S. Afr. Mus. **16**. II. 406 (1925), non Walp. *Arthratherum uniplume* Nees, Fl. Afr. Austr. 181 (1841).

Perennial, densely caespitose. Culms including the inflorescence up to 75 cm. high or more, erect, 3-4-noded, simple or branched upwards; internodes striate and terete,

smooth or scaberulous; nodes glabrous. *Leaf-sheaths* reduced to leafless scales, or the upper tight, terete, striate, smooth or scaberulous upwards, shorter than the internodes; ligule a ciliate rim; auricles densely bearded; collar glabrous; *blades* setaceous, convolute, curved or flexuous, up to 10 cm. long, glabrous and striate on the lower surface, scaberulous on the upper surface with usually a few long hairs towards the ligule. *Panicle* long-exserted, fairly compact to diffuse; axis terete in lower part, angular and scaberulous upwards; branches spreading or suberect, usually solitary but branched near the base, almost smooth; pedicels capillary, often sinuate, scaberulous, much thickened upwards. *Spikelets* pale yellow to purplish or purplish-brown. *Glumes* glabrous or with scattered marginal hairs, almost papery, unequal; the lower 8-9 mm. long; the upper 9-11 mm. long. *Lemma* cylindrical, including the callus about 4 mm. long, smooth, slightly tuberculate upwards; *callus* about 1 mm. long, acute, densely bearded; column of awns about 5 mm. long, densely penicillate at the apex, otherwise glabrous; central awn up to 2.5 cm. long, naked in its lower part, densely plumose upwards; lateral awns up to 12 mm. long, very fine.

SOUTH WEST AFRICA.

Hoarusib River, west of Klein Otavi, III. 1926, *Barnard* SAM. 33278 (S); Ombombo to Kaoko Otavi, II. 1926, *Barnard* SAM. 33310 (S); Omaheke, IV. 1913, *Dinter* 2883 (B); Andoni, *Barnard* 812 (S) et 817 (S); Otjitambi, *Schlettwein* 42a (B); Grootfontein, *Bail* 7 (B); Otjituo, II. 1906, *Seiner* 21 [671] (B, W); Otjiwarongo, III. 1928, *Bradfield* 268 pro parte (N); Ozondjache, XII. 1938, *Volk* 542 (D); Usakos, IV. 1939, *Volk* 74 (D); Fockshof, IV. 1938, *Volk* A. 158 (D); between Okatambeke and Owinauanau, IV. 1911, *Seiner* 443 (B); Okatambeke, II. 1911, *Seiner* 168 (B); Omaruru, VI. 1916, *Waibel* 122 (B); Ameib, II. 1885, *Belck* 53 (B, Z); Okahandja, XII. 1910, *Dinter* 1638 (B) et 1530 (B) et *Grossarth* 40 (B) et *Bertling* 5 (B); between Windhuk and Karibib, III. 1910, *Mücke* 66 (N); Ababes, XII. 1915, *Pearson* 9174 (K, S) et 9182 (K); between Kubas and Ababes, IV. 1913, *Engler* 6133 (B, K); Otjimbingue, V. 1886, *Marloth* 1330 (A, O); Windhuk, III. 1905, *Trotha* 116 (B) et *Bohr* 14 (B) et I. 1916, *Pearson* 9628 (K, S); Awas Mountains, I. 1916, *Pearson* 9649 (BH, K, S); 100 km. east of Walfishbay, *Wyley* s.n. (V); Rehoboth to Aub, IV. 1911, *Dinter* 2221 (B); between Nauchas and Areb, I. 1916, *Pearson* 9023 (BH, K, S, WR); Areb, III. 1908, *Hartmann* 10c (B); Sendlingsgrab, I. 1908, *Hartmann* 10b et 10d (B); Oas, *Polizeistation* 31 (B); between Gamis and Bull's Mouth Pass, *Pearson* 8940 (K); Gamis, XII. 1915, *Pearson* 8973 (K); Zeskameelboom, *Dinter* 2066 (B); between Voigtsgrund and Breckhorn, XII. 1915, *Pearson* 9350 (BH, K, S); between Voigtsgrund and Ganaams, XII. 1915, *Pearson* 9364 (K) et 9390 (K); Gründoorn, II. 1909, *Pearson* 4555 (A, D, K, N, S, Z); Awasab, *Hartmann* 10a (B); Horas, *Hartmann* 10 (B); Mount Brukkaros, II. 1931, *Sordahl* 15 (B, W) et IV. 1931, *Sordahl* 43 (B, W); Kunyas, V. 1907, *Range* 354 (B); between Ausis and Khuias, *Schenck* s.n. (V); Byzondermaid, I. 1885, *Schinz* 660 (Z); Kunub, IV. 1911, *Range* 1015 (B); between Gellap and Great Fish River, XII. 1915, *Pearson* 9285 (K); Garinai, *Eichler* 35 (B); Lüderitzbucht (Angra Pequena), *Schinz* 662 (Z) et VII. 1903, *Schultze* 46 (B); Kuibis, V. 1909, *Range* 656 (B); Buchholzbrunn, II. 1909, *Pearson* 3655 (BH, K); Sandverhaar, *Pearson* 3704 (N) et 4620 (K) et 4603 (K); Seeheim to Kalkfontein, II. 1909, *Schäfer* 58 (B); Inachab, XI. 1897, *Dinter* 1089 (Z); Wasserfall, I. 1913, *Pearson* 8606 (BH, N); Little Karas Mountains, I. 1916, *Pearson* 9724 (BH, K, S); Sabiesis, II. 1909, *Pearson* 4117 (BH, D, K, N, S); Great Karas Mountains, I. 1913, *Pearson* 8499 (BH, D, G, K, W) et 8500 (BH, K, S) et *Blank* 61 (B); Naossonabis, XI. 1909, *Range* 802 (B); Dabaigabis, I. 1909, *Pearson* 4381 (A, K, N, S); Warmbad, I. 1909, *Pearson* 4027 (K, S, T).

BECHUANALAND PROTECTORATE.

Makarikari Lake, IV. 1931, *Pole Evans* 3283 (B, K, N); Artesia, IV. 1931, *Pole Evans* 3167 (K, N) et 3172 (N); Pitsani, IV. 1929, *Pole Evans* 2344 (K, N); Kutje, V. 1928, *Nobbs* 60 (U); Letlaking, V. 1928, *Nobbs* 23 (U); Kaotwe, IV. 1930, *van Son* TM. 28608 (T); between Malopo and Kaotwe, V. 1928, *Nobbs* 74 (U); Kauke, III. 1930, *van Son* TM 28610 (T); between Sekuma and Kooa, I. 1905, *Schultze* 342b (B).

CAPE PROVINCE.

Gordonia distr.: Upington, VII. 1925, *Barnard* SAM. 36146 (S); do., VIII. 1923, *Borchers* H. 21524 (N); near Spitzkop, IV. 1928, *Pole Evans* 2178 (N). Kenhardt distr.: Aughrabies Falls, IV. 1936, *Leipoldt* BH. 21754 (BH). Hay distr.: Eitalersfontein, *Rehmann* 3346 (B, K, Z); Griquatown, anno 1928, *Conradie* 4 (St); near Griquatown, III. 1920, *Pole Evans* 26 (K). Herbert distr.: Witkoplaagte, IV. 1937, *Wilman* 4198 (B, K, N, V, Z). Kimberley distr.: Modderrivier, II. 1894, *Kuntze* s.n. (B); Kenilworth, IX. 1901, *Galpin* 6319 (N); Riverton, IV. 1914, *Wilman* 690 (Mc). Barkly West distr.: Barkly West, II. 1921, *Wilman* 2142 (Mc). Kuruman distr.: Kuruman, III. 1928, *Pole Evans* 2062 (N) et 2094 (N, W); do., *Dedman* in Hb. Stell. 10052 (St); without precise locality: *Lichtenstein* 50 (60 ?), C. b. Sp., (B); L. Bushmanland, *Marloth* 3721 (N).

ORANGE FREE STATE.

Boshof distr.: Smitskraal, IV. 1911, *Burt Davy* 10123 (N); Kroonstad distr.: Bothaville, I. 1933, *Goossens* 1172 (B, N).

TRANSVAAL PROVINCE.

Pretoria distr.: Between Elandsrivier and Klippan, *Rehmann* 5113 (B, K). Lydenburg distr.: Near Lydenburg, *Atherstone* s.n. (A, K, S). Waterberg distr.: Warmbaths, II. 1936, *Irvine* 41 (N). Zoutpansberg distr.: Zoutpan, IV. 1934, *Schweickerdt et Verdoorn* 630 (B, N); Messina, *Pole Evans* 1906 (N).

TYPE SPECIMEN.

Lichtenstein 50 (60 ?) is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Blinkaar. Bushman grass. Buschmanngras. Langbeen Twaas. Large Bushman grass. Silwergras. Soetgras. T'waagras.

ECONOMIC NOTES.

This species constitutes one of the main fodder-grasses of the Namib where it remains green only for a very short period; it is also eaten in the dried state by stock and game. In the Griqualand West area it is also considered an excellent fodder and as it does not produce stools, it may be cut and stored as hay or silage. In the pre-flowering and flowering stage this grass is sweet, but gradually becomes less so after frost and winter rain. In the wilted condition this species has been found to contain prussic acid.

24a. **A. uniplumis** Licht. var. *Neesii* Trin. et Rupr. Gram. Stip. 173 (1842); Walp. Ann. Bot. 3. 750 (1852); Dur. et Schinz, Consp. 5. 809 (1894); Dinter in Fedde, Rep. 15. 343 (1918); Henrard Crit. Rev. 3. 646 (1928); Henrard Monogr. 1. 77 (1929).

A. uniplumis Licht. sec. Stapf in Dyer, Fl. Cap. 7. 569 (1899) pro parte; Stent in Bothalia 1. IV. 278 (1924), non Licht.

The facies of this variety greatly resembles that of the species. The glumes however are longer and the lemma is somewhat larger than in the species. Furthermore the central awn is fairly robust, usually dark in colour and plumose to the base, the column however is glabrous.

CAPE PROVINCE.

Colesberg distr.: Near Colesberg, *Drège* 901 (B). Kimberley distr.: Rietpan, III. 1917, *Potgieter* TM. 19179 (T); Warrenton, IV. 1917, *Pole Evans* H. 11623 (K); Warrenton, II. 1926, *Smith* 2347a (N). Barkly West distr.: Driefontein, XII. 1936, *Acocks* 1468 (Mc). Hay distr.: Near Postmasburg, VI. 1929, *Uys* G. 3 (N). Vryburg distr.: Vryburg, III. 1920, *Stent* H. 21515 et H. 21449 (N); do., II. 1923, *Rodger* BH. 21801 (BH, Mc); do., II. 1916, *Viljoen* H. 12044 (K); Armoedsvlakte, IV. 1912, *Sharpe* H. 7473 (N); do., III.

1924, *Henrici* 89 (N); do., XII. 1920, *Mogg* in Hb. Stell. 12543 (St). Mafeking distr.: Mafeking, IV. 1929, *Pole Evans* 2426 (K, N) et 2441 (K, N) et IV. 1929, *Pole Evans* 2397 (K, N, W). Kuruman distr.: Witdraai, III. 1917, *Pole Evans* 2096 (N).

BECHUANALAND PROTECTORATE.

Nkate, IV. 1931, *Pole Evans* 3297 (K) et 3298 (N) et 3302 (K); Metsematluko, IV. 1928, *Nobbs* 25 (U); Mochudi, I. 1914, *Rogers* 6315 (BH, K, N, T); do., IV. 1914, *Harbor* BH. 21800 (BH).

ORANGE FREE STATE.

Bloemfontein distr.: Bloemfontein, *Rehmann* 3722 (B, BM, K, Z); Glen, IV. 1926, *School of Agriculture* NH. 3446 (N). Hoopstad distr.: Wesselsbron, I. 1933, *Goossens* 1248 (B, N); Hoopstad, III. 1909, *Potts* 1149 (GU). Kroonstad distr.: Bothaville, IV. 1931, *Boshoff* 2 (N). Boshoff distr.: Bethel-Pella, IV. 1931, *Wolff* 12 (N). Between Kimberley and Bloemfontein, *Buchanan* 291 (K, S).

TRANSVAAL PROVINCE.

Bloemhof distr.: Christiana, III. 1912, *Burt Davy* 12975 (N); Smitskraal, IV. 1911, *Burt Davy* 10123 pro parte (N); Schweizer Reneke, II. 1904, *Burt Davy* 1627 (N). Wolmaransstad distr.: Wolmaransstad, IV. 1931, *Liebenberg* 2437 (N, W); Maquassi, II. 1918, *Rogers* 20654 (G, Z). Zoutpansberg distr.: Messina, X. 1929, *Turner* 23 (N); do., II. 1919, *Rogers* 22545 (T, Z).

TYPE SPECIMEN.

Drège from Colesberg deposited in the Botanisches Museum, Berlin-Dahlem? Perhaps there is a specimen in the Trinius Herbarium, Leningrad which should be regarded as the type. I have not seen this sheet.

24b. **A. uniplumis** *Licht. var. Pearsonii* *Henr.* Crit. Rev. **3.** 647 (1928); *Henrard Monogr.* **1.** 77 (1929).

A. Dregeana Trin. et Rupr. sec. Dinter in Fedde, Rep. **15.** 341 (1918) pro parte, non Trin. et Rupr. *A. uniplumis* Licht. sec. Hack. in Bull. Herb. Boiss. **4.** Append. III. 19 (1896); Stapf in Dyer, Fl. Cap. **7.** 569 (1899); Garabedian in Ann. S. Afr. Mus. **16.** II. 405 (1925) omnes pro parte, non Licht.

This variety greatly resembles the species but may be recognised by the column of the awns which is plumose in its upper part (at times so almost from the base). The central awn is not as rigid and bristlelike as in the *var. Neesii*, furthermore the latter has larger glumes.

ANGOLA.

Between Gambos and Cabama, V. 1909, *Pearson* 2487 (K).

SOUTH WEST AFRICA.

Ondongo, *Barnard* SAM. 32241 (S); Grootfontein, II. 1933, *Schoenfelder* 98 (K, N); Omatope, II. 1886, *Schinz* 659 (V, Z); Blockfontein, V. 1939, *Volk* 1694 (D); Otjiwarongo, XII. 1938, *Volk* 394 (D); Otjiputo, II. 1939, *Volk* 1230 (D); Otjimbingue, *Marloth* 1330 (B, V); Gobabis, II. 1906, *Kupper* 60 (B); without precise locality, *Wembley Exhibition* 29 (B, BH, S).

BECHUANALAND PROTECTORATE.

Makarikari Lake, IV. 1931, *Pole Evans* 3287 (K, N). Mochudi, I. 1914, *Rogers* 6596 (A, K, T, Z).

CAPE PROVINCE.

Kimberley distr.: Kimberley, *Rehmann* 3470 (K, Z).

ORANGE FREE STATE.

Without precise locality, *Buchanan* 69 (D, K, S).

TYPE SPECIMEN.

Pearson 2487 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

25. **A. gonatostachys** *Pilger* in Engl. Bot. Jahrb. **48**. 343 (1912); *Dinter* in Fedde, Rep. **15**. 341 (1918); *Garabedian* in Ann. S. Afr. Mus. **16**. II. 402 (1925); *Henrard* Crit. Rev. **1**. 205 (1926); *Henrard* Monogr. **1**. 81 cum ic. tab. 20 (1929); *Range* in Fedde, Rep. **33**. 8 (1933); *Theron* in Fedde, Rep. **40**. 30 (1936) [sphalm. *gonostachys*].

Perennial, densely caespitose, tufts 2-3.5 cm. high. *Culms* up to 10 cm. long, exerted beyond the small tussocks, somewhat geniculate, 1-noded; lower internode exerted, 5-6 cm. long, slender, terete, thickened upwards towards the node; upper node hairy. *Lower leaf-sheaths* reduced to yellowish broad scales, sulcate-striate, glabrous or scantily woolly along the margins, the upper sheath partly embracing the inflorescence, scaberulous and leafless; *ligule* a ciliate rim; auricles densely long-bearded; blades up to 2 cm. long, involute, obtuse, striate and sulcate, scaberulous on the lower surface, with fairly long hairs arising dorsally between the longitudinal ridges, upper surface hirtellous, curved, glaucous. Peduncle very short. *Panicle* almost sessile, sheathed by the uppermost sheath, 3-4 cm. long, spike-like; axis striate and pubescent; lower branches binate, the upper solitary. Pedicels clavate and hairy near the apex. *Spikelets* pallid, somewhat secund. *Glumes* subequal, 7-9 mm. long, lanceolate, acuminate, the lower distinctly scaberulous. *Lemma* including the callus about 4 mm. long; *callus* 1 mm. or somewhat longer, acute, shortly bearded, but long-bearded at the base of the lemma; column of awns up to 4 mm. long; central awn about 1 cm. long, glabrous at the base, densely plumose in its upper part up to the tip; lateral awns about 7 mm. long.

SOUTH WEST AFRICA.

Rotekuppe, I. 1907, *Range* 188 (B); do., I. 1910, *Dinter* 1022 (B); Guos, Küstenwüste, IX. 1911, *Range* 1177 (B, N).

TYPE SPECIMEN.

The Syn-types are deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAME.

Kleines Buschmanngras.

26. **A. lanipes** *Mez* in Fedde, Rep. **17**. 153 (1921); *Garabedian* in Ann. S. Afr. Mus. **16**. II. 403 (1925); *Henrard* Crit. Rev. **2**. 285 (1927); *Henrard* Monogr. **1**. 81 (1929); *Theron* in Fedde, Rep. **40**. 30 (1936).

Perennial, densely caespitose, dwarf, including inflorescence up to 10 cm. high. *Lower leaf-sheaths* pallid, striate, dorsally glabrous but densely woolly lanate towards and on the margins with white hairs, margins of leaf-sheaths upwards hyaline, upper leaf-sheaths densely woolly all over the dorsal surface, only the stout midrib clearly visible; *ligule* a fringe of woolly hairs; *blades* about 0.5-1.0 cm. long, somewhat recurved, linear, obtuse, glabrous and striate, glaucous, apparently terete but the margins conduplicate and somewhat involute. Culm 1-noded (the lowermost node sheathed but not exerted.) Axis terete, glabrous somewhat thickened towards the node. *Sheath* arising at the upper node in the axil of which the inflorescence appears to arise, narrowly lanceolate, glaucous, glabrous, striate, with a much-reduced blade. *Inflorescence* \pm 4-flowered, a lax sub-simple panicle, with the branchlets at the base of the inflorescence bearing 1-2 spikelets. Rhachis sub-compressed, striate, flexuous, minutely scaberulous. Pedicels likewise, somewhat thickened towards the apex. *Glumes* subequal, three-nerved; the lower slightly shorter than the upper, about 9-9.5 mm. long, with minutely scaberulous lines on the outer surface not

unlike those found in *A. obtusa* Del.; the upper smooth and glabrous, margins hyaline. *Lemma* \pm 6 mm. long including the callus; *callus* acute, densely hairy, about 2 mm. long; column of awn 2.0 mm. long, twisted, glabrous. Central awn plumose towards the apex, naked and glabrous below and at the point of insertion of the lateral filiform glabrous 9 mm. long awns. *Anthers* 3 mm. long.

SOUTH WEST AFRICA.

Near Lüderitzbucht, west of Kuibis, *Range* 1822 (B).

TYPE SPECIMEN.

Range 1822 (unicum?) is deposited in the Botanisches Museum, Berlin-Dahlem.

This species is very closely related to *A. gonatostachys* Pilger and differs from it in several minor points. The facies of the two species concerned is very similar. A wider range of material of these two species may prove them to be conspecific.

27. **A. Dregeana** (Nees) Trin. et Rupr. Spec. Gram. Stip. 169 (1842); Walp. Ann. Bot. 3. 749 (1852); Steud. Syn. Pl. Glum. 1. 144 (1854); Dur. et Schinz, Consp. 5. 802 (1894); Stapf in Dyer, Fl. Cap. 7. 569 (1899) excl. syn. pro parte; Dinter in Fedde, Rep. 15. 341 (1918); Garabedian in Ann. S. Afr. Mus. 16. II. 401 (1925) pro parte; Henrard Crit. Rev. 1. 154 (1926); Henrard Monogr. 1. 83 cum ic. tab. 22 (1929); Range in Fedde, Rep. 33. 8 (1933); Theron in Fedde, Rep. 40. 20 (1936).

A. obtusa Del. sec. Hack. in Bull. Herb. Boiss. 4. Append. III. 19 (1896) non Del.; Garabedian in Ann. S. Afr. Mus. 16. II. 403 (1925) pro parte, non Del. *Stipagrostis Dregeana* Nees, Fl. Afr. Austr. 172 (1841); Presl, Bot. Bemerk. 121 (1844).

Perennial, densely caespitose, much-branched at the base. *Culms* slender, erect or geniculate ascending, simple, 1-3-noded, the lowermost node basal or almost so, up to 25 cm. high including the awns; internodes terete or somewhat compressed, smooth and glabrous, usually exerted; nodes glabrous. *Leaf-sheaths* very tight, distinctly striate, slightly scaberulous, shorter than the internodes; the lower broad, pallid, firm and persistent, much-reduced and scale-like, bearing very short blades; *ligule* a short ciliate rim; auricles pubescent; collar glabrous; blades setaceous, convolute, subacute, up to 12.5 cm. long, fairly rigid, glabrous and smooth beneath, more or less hirtellous or pubescent on the upper surface. *Panicle* erect, or somewhat nodding at the summit, lax and loose, up to 12 cm. long including the awns; rhachis smooth, grooved; branches usually binate, smooth; branchlets 1-2-flowered; the branches, branchlets and pedicels rather capillary and often flexuous. *Spikelets* yellowish and purple. *Glumes* linear-lanceolate, subacuminate, subequal, 3-nerved; the lower 11-13 mm. long, acuminate, purple towards the base, minutely scaberulous on the keel towards the apex, towards the apex often a few scattered minute hairs, in the young state dorsally often somewhat shortly hairy, hairs deciduous; the upper 11-13 mm. long, obtuse, emarginate or distinctly bifid, mucronate from the sinus, minutely scaberulous towards the apex, otherwise glabrous, purple towards the base. *Lemma* oblong-cylindric, glabrous, purplish, including the callus about 4 mm. long; *callus* acute, densely hairy, 1-1.5 mm. long; column of awns about 4 mm. long, twisted, glabrous; central awn 3-4 cm. long, feathery above the middle to the very tip, plumose region obtuse in outline; lateral awns naked or very nearly so, up to 17 mm. long. *Anthers* 5.5-6 mm. long.

SOUTH WEST AFRICA.

North of Lüderitzbucht, X. 1906, *Range* 8 (B); Lüderitzbucht (Angra Pequena), Hermann 49 (B); do., 1907, *Range* 491 (B); do., IV. 1909, Marloth 4664 (K, N); do., Galpin et Pearson 7395 (K); do., VII. 1925, Moss 11518 (K); do., Peyer 4 (Z); Pomona, V. 1929, Dinter 6344 (B, D, G, K, St); do., VI. 1929, Dinter BH. 21797 (BH); Klinghardtgebirge, VIII. 1913, Schäfer 512 (B); Buchberge, VIII. 1929, Dinter 6602 (B, BH, K, St); Hereroland, 1887, Nels 72 (Z).

CAPE PROVINCE.

Little Namaqualand distr.: Near mouth of Orange River, X. 1830, *Drège* (2543) (B, BM, G, K, N, O, P, V); Groot Derm, X. 1926, *Pillans* 5615 (BH, K, N); Witbank, X. 1926, *Pillans* 5217 (BH, N).

TYPE SPECIMEN.

Drège 2543 is deposited in the Botanisches Museum, Berlin-Dahlem.

28. *A. garubensis* *Pilger* in Engl. Bot. Jahrb. **48**. 344 (1912); Dinter in Fedde, Rep. **15**. 341 (1918); Garabedian in Ann. S. Afr. Mus. **16**. II. 402 (1925); Henrard Crit. Rev. **1**. 192 (1926); Henrard Monogr. **1**. 80 cum ic. tab. 21 (1929); Range in Fedde, Rep. **33**. 8 (1933); Theron in Fedde, Rep. **40**. 8 (1936).

A. dregeana Trin. et Rupr. sec. F. Bolus in Ann. S. Afr. Mus. **9**. IV. 234 (1915) pro parte, non Trin. et Rupr.

Perennial, laxly caespitose, from a much-branched almost woody rootstock. Innovations erect or irregularly ascending, intra- or extravaginal. *Culms* erect or somewhat ascending, rather thin and elegant if compared with the robustly-branched rootsystem, terete, smooth, 2-3-noded; internodes terete, glabrous, exserted; nodes glabrous. Lower *leaf-sheaths* reduced to pale striate glabrous scales, bearing much-reduced leaf-blades; the upper tight, shorter than the internodes, glabrous and terete below, striate upwards; *ligule* a minute ciliate rim; auricles minutely pubescent or glabrous; collar glabrous; *blades* very narrow, linear, convolute, setaceous, acute and subpungent, rather rigid and curved (almost wiry), up to 12 cm. long, glabrous and striate beneath, hirtellous on the upper surface, glaucous, gradually tapering to a point. *Panicle* shortly exserted, up to 20 cm. long including the awns, somewhat depauperate, very lax and open; rhachis terete and smooth below, rather angular and scaberulous upwards; axils glabrous; lower branches solitary or 2-3-nate from the base, the upper solitary, all few-flowered and scaberulous; pedicels minutely scaberulous, subclavate, as long as or shorter than the glumes. *Spikelets* erect, pallid but purplish towards their base. *Glumes* lanceolate, glabrous; the lower up to 12 mm. long, shortly bidentate at the subobtusate apex; the upper subacute, 12.5-15 mm. long. *Lemma* smooth, including the callus about 5.5 mm. long; *callus* 1.5 mm. long, hairy, acute; column of awns 8-10 mm. long, twisted; central awn up to 40 mm. long, naked in the lower third or plumose almost to the base, plumose to the very tip, slender and acute in outline; lateral awns naked, very thin, up to 15 mm. long.

SOUTH WEST AFRICA.

Kunguibgeberge, X. 1912, *Range* 1069 (B); 18 km. west of Aus, II. 1909, *Pearson* 4213 (BH, K); Garub, X. 1907, *Range* 508 (B, BM, K, N); do., X. 1907, *Range* 536 (B).

TYPE SPECIMEN.

Range 508 and 536 are deposited in the Botanisches Museum, Berlin-Dahlem.

29. *A. sericans* *Hack. apud Schinz* in Bull. Herb. Boiss. **3**. 381 (1895); Stapf in Dyer, Fl. Cap. **7**. 563 (1899); Henrard Crit. Rev. **3**. 554 (1928); Henrard Monogr. **2**. 158 cum ic. tab. 61 (1932); Theron in Fedde, Rep. **40**. 17 (1936).

Perennial, densely caespitose. *Culms* simple, erect, terete, up to 75 cm. high, very slender, 1-noded. *Leaf-sheaths* very tight, striate, glabrous or hairy all over except in the region just above the nodes, shorter than or exceeding the internodes; *ligule* ciliate; auricles bearded; *blades* finely filiform, setaceous, strictly erect, convolute, acute, up to 30 cm. long or even almost as long as the culms, glaucous, glabrous or hairy below, glabrous or hispidulous above, 0.5-1.0 mm. wide, strongly nerved. *Panicle* erect, dense, up to 20 cm. long, the base of the panicle sheathed by a submembranous thinly villous light-brown bract, the upper branches sparingly branched; branchlets and pedicels hairy or glabrous, the latter much shorter than the glumes. *Glumes* subequal, villous, linear-lanceolate,

acuminate, 3-nerved, with sparingly hairy or hyaline tips; the lower 10–15 mm. long; the upper 12–16.5 mm. long. *Lemma* purple, smooth, slightly scaberulous towards the apex, linear-lanceolate, including the callus up to 7 mm. long, produced without an articulation into the column; *callus* about 1–1.5 mm. long, acute, densely hairy; column 2–3.5 mm. long, twisted, hairy; central awn divergent or spreading, up to 24 mm. long, densely but shortly plumose except for the scabrid apex; lateral awns resembling the central, but only up to 18 mm. long. *Pale* 2.5 mm. long, obtuse, nerveless. *Anthers* about 5 mm. long. *Stigmas* pale yellow, up to 2.5 mm. long. *Caryopsis* linear, 4 mm. long, 0.3 mm. wide, pale brown.

TRANSVAAL PROVINCE.

Standerton distr.: Standerton, *Rehmann* 6793 (B, BH, BM, K, V, Z). Vereeniging distr.: Leeuwkuil Pasture Research Station, III. 1937, *Bunting* 137 (K, N, WR); do., IX. 1937, *R. Story* in NH. 24574 (B, BM, K, N, V, W, Z); do., III. 1939, *R. Foster* in NH. 24575 (B, BM, K, N, V, W, Z).

TYPE SPECIMEN.

Rehmann 6793 is deposited in the Naturhistorisches Museum, Vienna.

REMARKS.

A very rare species apparently with a limited geographic distribution. Until the very welcome recent rediscovery of this plant by Mr. R. Story (*Bunting* 137) the author of the present paper believed this plant to have been of hybrid origin. *Rehmann* 4046 from Pretoria cited by Stapf in Dyer, Fl. Cap. 7. 563 (1899) under this species very probably does not belong here. I do not remember seeing this number and possibly the locality indicated on the sheet is incorrect, as *A. sericans* is so far only known to occur in the true Highveld area of the Transvaal.

The species bears a strong resemblance to *A. capensis* Thunb. var. *Dieterleniana* mihi with which it may readily be confused. Dissection of the spikelets however immediately reveals that the species in question belong to different sections of the genus.

30. **A. Sciurus** Stapf in Dyer, Fl. Cap. 7. 557 (1899); Stent in Bothalia 1. IV. 277 (1924); Henrard Crit. Rev. 3. 548 (1928); Henrard Monogr. 2. 164 cum ic. tab. 65 (1932).

Robust erect *perennial*, up to 140 cm. high. *Culms* arising from a short rhizome, about 4–5-noded, simple; internodes included or exerted, up to 25 cm. long but often much shorter, almost glabrous to densely adpressedly woolly just below the nodes, terete, smooth or somewhat striate towards the nodes; nodes glabrous, not very conspicuous. *Leaf-sheaths* crowded near the base, striate, glabrous or more or less fugaciously woolly, tight; *ligule* a line of very short hairs obscured by the dense aggregation of wool at the mouth of the leaf-sheath, more rarely the mouth of older leaf-sheaths almost glabrous; *blades* linear, acute, setaceously convolute, up to 60 cm. long or even longer, smooth on the lower surface, markedly striate and finely asperulous on the upper surface, about 5 mm. wide or less at the base. *Panicle* dense, contracted, at times almost spike-like, up to 45 cm. long but often shorter, erect; rhachis stout, smooth; branches fascicled, the lowest up to 20 cm. long, remotely and repeatedly branched; branchlets filiform to capillary, scaberulous. *Spikelets* pallid or tinged with purple, glabrous. *Glumes* 1-nerved, very unequal, fairly thin; the lower lanceolate oblong, acute, 5–7 mm. long, minutely scaberulous towards the apex; keel prominent and minutely scabrous; the upper linear-oblong, 11–13 mm. long, shortly mucronate from a bifid apex. *Lemma* linear, up to 12 mm. long, smooth, obscurely beaked; *callus* 1–1.5 mm. long, rounded and obtuse, densely hairy; awns subequal, the central up to 23 mm. long, the lateral up to 20 mm. long. *Pale* 1.5 mm. long. Lodicules few-nerved, about 1.5 mm. long. *Anthers* 6 mm. long, anther-cells minutely apiculate.

NATAL PROVINCE.

Estcourt distr.: Colenso, III. 1894, *Kuntze* s.n. (K, N); without precise locality, *Gerrard* 471 (BM, K, N) and *Gerrard et McKen* 161 (D, N).

TRANSVAAL PROVINCE.

Carolina distr.: Waterval Boven, II. 1904, *Burt Davy* 1449 (N); Badplaats, II. 1926, *Pole Evans* 1967 (N); between Machadodorp and Carolina, II. 1908, *Mundy* H. 4292a (N). Lydenburg distr.: Machadodorp, III. 1934, *Pole Evans* 3688 (N). Waterberg distr.: Zebediela's Kraal, *Nelson* 26 (K, N).

TYPE SPECIMEN.

Nelson 26 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

REMARKS.

The amount of wool (pubescence) on the internodes is variable. Some specimens (*Burt Davy* 1449) have almost glabrous internodes. The elongated obtuse callus and the absence of an articulation in the lemma however, provide a good means of distinguishing the species.

31. **A. bipartita** (Nees) Trin. et Rupr. Spec. Gram. Stip. 144 (1842); Walp. Ann. Bot. 3. 745 (1852); Steud. Syn. Pl. Glum. 1. 140 (1854); Dur. et Schinz, Consp. 5. 801 (1894); Medley-Wood, Natal Plants 5. IV. tab. 483 cum descr. (1908); Phillips in Ann. S. Afr. Mus. 16. 347 (1917); Stent in Bothalia 1. IV. 277 (1924); Henrard Crit. Rev. 1. 54 (1926); Henrard Monogr. 2. 194 cum ic. tab. 89 (1932).

A. aequiglumis Hack. sec. Medley-Wood, Natal Plants 2. tab. 197 cum descr. (1904), non Hack. *Chaetaria bipartita* Nees, Fl. Afr. Austr. 187 (1841).

Perennial, densely caespitose, with a short erect or oblique rhizome. *Culms* erect or ascending, including the inflorescence up to 65 cm. high, but usually much smaller, simple, terete or compressed below, glabrous or puberulous, few-noded; internodes exserted, striate; nodes glabrous. *Leaf-sheaths* shorter than the internodes, compressed, firm, striate, persistent, glabrous or minutely puberulous between the nerves, the upper lax and smooth. *Ligule* a densely ciliate rim; auricles long-bearded; collar more or less scaberulous; *blades* narrow, linear, acute, up to 20 cm. long, usually very much shorter, up to 2 mm. wide when expanded, glaucous, rigid, curved and folded, smooth or scaberulous on the lower surface, scabrous on the upper surface, strongly nerved, margin minutely scabrous. *Panicle* effuse, up to 30 cm. long (though usually much smaller), and about as broad, very lax; rachis straight or somewhat flexuous, angular, striate, very scabrous upwards; branches spreading, solitary and distant, often branched again into 2 to several branches just above the base, axils pubescent only, naked over a long distance, scanty and remotely branched upwards; branchlets filiform and straight, scabrous, with 1-3 spikelets at the tips; pedicels long, adpressed, the lateral ones usually very much shorter than the glumes, scabrous. *Spikelets* pallid to purplish in colour. *Glumes* unequal, the lower exceeding the upper in length, 1-nerved, linear-lanceolate, mucronate or shortly awned; the lower smooth with a somewhat scabrous keel upwards, up to 11 mm. long; the upper smooth, at times slightly emarginate, up to 9 mm. long. *Lemma* tubulous, not beaked, usually somewhat shorter than the glumes, about up to 8 mm. long, smooth and punctulate above only; *callus* shortly bearded; awns subequal or the central slightly longer, scabrous, 7-13 mm. long, divergent.

CAPE PROVINCE.

Somerset East distr.: Somerset East, *Bowker* 166 (K). Fort Beaufort distr.: Kac rivier, *Drège* 3878 (B, BM, G, K, N, O, P, S, V). Kingwilliamstown distr.: Kingwilliamstown, XII. 1894, *Schlechter* 6126 (A, B, BM, G, K, N, V, Z); do., *Sim* 31 (Z). East London distr.: East London, III. 1933, *Langenegger* s.n. (N). Komgha distr.: Komgha, *Flanagan* 1775 (A, BH, N). Queenstown distr.: Queenstown, *Everett* 58 (N); do., II. 1899, *Galpin* 2578 (A, K, N).

NATAL PROVINCE.

Pietermaritzburg distr. : Near Pietermaritzburg, XII. 1898, *Medley Wood* 7232 (K). Inanda distr. : Verulam, VII. 1893, *Schlechter* (A, B, BH, BM, G, K, N, V, Z). Estcourt distr. : Winterton, I. 1933, *King* 385 (N). Klip River, *Rehmann* 7102 (BM, K, N, V, Z). Without precise locality : XII. 1898, *Medley Wood* 7358 (D, K). Zululand, Mtunzini distr. : V. 1919, *Mogg* H. 20043 (N, W) and XI. 1919, *Mogg* 5921 (N).

BASUTOLAND.

Mohale's Hoek distr. : Maphutseng, I. 1916, *Dieterlen* 1208 (N, K, P, S). Leribe distr. : Leribe, II. 1877, *Buchanan* 125 (K).

ORANGE FREE STATE.

Bloemfontein distr. : Bloemfontein, *Rehmann* 3736 (B, BM, K, V, Z); Senekal distr. : Doornkop, XII. 1931, *Goossens* 930 (B, K, N, W). Bethlehem distr. : Bethlehem, I. 1932, *Goossens* 1123 (N). Kroonstad distr. : Kroonstad, *Pont* 100 (Z); do., II. 1928, *Pont* 5 (N); do., *Chennells* 86 (BH). Heilbron distr. : Maccauwei, X. 1924, *Brandmuller* 108 (N). Without precise locality : *Buchanan* 63 (BH); *Burke* 430 (K, S, Z); *Burke and Zeyher* 1810 (O, V); *Zeyher* 1810 (BM, K, N).

TRANSVAAL PROVINCE.

Vereeniging distr. : Vereeniging, XII. 1935, *Story* 11 (N). Heidelberg distr. : Uitgevalen, XII. 1909, *Burt Davy* 9125 (N). Wakkerstroom distr. : Amersfoort, III. 1917, *Burt Davy* 17349 (K, N). Johannesburg distr. : Johannesburg, *English* 21788 (BH). Pretoria distr. : Pretoria, II. 1924, *Dickson* 17 (N); do., IV. 1933, *Smith* 6553 (N); do. *Appleton* 91 (K); do., II. 1936, *Mogg* 13727 (N); do., XII. 1933, *Barrie* in Hb. Stell 19669 (St). Lydenburg distr. : Waterval Boven, IV. 1904, *Burt Davy* 1443 b (N). Middelburg distr. : Klein Olifants Rivier, XI. 1893, *Schlechter* 3820 (A, B, BM, D, G, K, N, T, V, Z). Potchefstroom distr. : Klerksdorp, III. 1932, *Moses* 9 (N).

TYPE SPECIMEN.

Drège 3878 is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Krulgras. Steekgras.

ECONOMIC NOTES.

This species is readily eaten by stock.

32. **A. scabrivalvis** *Hack.* in Bull. Herb. Boiss. Ser. 2. **6.** 708 (1906); Dinter in Fedde, Rep. **15.** 343 (1918); Stent in Bothalia **1.** IV. 277 (1924); Henrard Crit. Rev. **3.** 534 (1928); Henrard Monogr. **2.** 202 cum ic. tab. 91 (1932).

Annual, slender, erect or somewhat ascending, including the inflorescence up to 85 cm. high, often very much smaller, usually branched from or very near the base. *Culms* elegant, slender, branched from nearly all nodes, about 3-4-noded; nodes usually conspicuous, glabrous; internodes glabrous, up to 12 cm. long, exerted, more or less terete. *Leaf-sheaths* lax, the lower slipping from the culms, keeled, striate, minutely scaberulous or glabrous; *ligules* densely and shortly ciliolate; auricles densely ciliolate or glabrous; collar glabrous; *blades* linear, gradually narrowed, up to 30 cm. long and 3.5 mm. wide, often much shorter and narrower, rigid or somewhat flaccid, glabrous beneath, scaberulous and hirtellous on the upper surface, margins scabrous and thickened. *Panicles* terminal and lateral, lax and open, up to 30 cm. or more long, often very much shorter and smaller, ovate in outline. Axis smooth or very minutely scaberulous; branches filiform, straight or somewhat flexuous, scaberulous, solitary or binate, elongate, the lower sometimes more than half as long as the panicle, naked in their lower part, the spikelets more or less scattered or at times congested towards the ends of the branches; pedicels scaberulous, longer to

shorter than the glumes. *Spikelets* usually purple or purplish-brown in colour. *Glumes* linear-lanceolate, acute, prominently awned, slightly unequal to unequal, scaberulous, with a very markedly scabrous keel; the lower up to 9 mm. long, including the awn but often much shorter, awn 2.5 mm. long arising from the slightly bifid apex of the glume; the upper also up to 9 mm. long including the 1.5 mm. long awn, lateral setae well-developed. *Lemma* linear, tubular or somewhat compressed and keeled, about 7-8 mm. long, often much shorter, usually aculeolate-scabrous except near the base but always markedly scabrous on the keel, purplish to greenish in colour and usually mottled, somewhat narrowed towards the apex; *callus* \pm 0.5 mm., rounded, densely bearded; awns up to 14 mm. long, scabrous, erect or spreading, the lateral slightly shorter than the central.

SOUTH WEST AFRICA.

Otavi, II. 1925, *Dinter* 5752 (BH, G, GU, N, S, Z); Otjenga, III. 1939, *Volk* 1396b (D); Ossa, III. 1939, *Volk* 1538 (D) et 1539 (D); Otjiputo, II. 1939, *Volk* 1239 (D).

CAPE PROVINCE.

Barkly West distr.: Newlands, III. 1934, *Paton* 3158 (K, Mc); Shalen, II. 1937, *Acock* 1859 (Mc); near Spitzkop, II. 1937, *Acock* 1809 (K, Mc).

TRANSVAAL PROVINCE.

Potchefstroom distr.: Oudeplaats, IV. 1937, *Bunting* 157 (N). Vereeniging distr.: Vereeniging, I. 1915, *Burt Davy* 15175 (BH) et III. 1917, *Burt Davy* 17214 (N). Boksburg distr.: Vogelfontein, V. 1918, *Rogers* 22675 (Z). Johannesburg distr.: Frankenwald, I. 1933, *Frankenwald Herb.* 229 (WR). Pretoria distr.: Pretoria, II. 1924, *Dickson* 15 (N); do., III. 1925, *McClellan* 11 (N); do., III. 1914, *Mogg* 10432 (N); do., I. 1926, *Smith* 2264 (N); do., VI. 1912, *Theiler* 12015 (T); do., IV. 1932, *Smith* 6198 (K); do., II. 1939, *Schweickerdt* 1325 (B, K, N, W); Pienaars River, I. 1894, *Schlechter* 4217 (A, BM, G, K, N, P, T, V, Z); do., I. 1926, *Smith* 2170a (N); Saltpan, II. 1937, *Bunting* 76 (N) et 80 (N); do., III. 1937, *Bunting* 117 (N). Waterberg distr.: Warmbaths, I. 1936, *Irvine* 20 (N); Naboomspruit, I. 1919, *Galpin* 427 (N, W) et III. 1923, *Galpin* 566 (N); Potgietersrust, II. 1921, *Galpin* 8891 (K, N, W); Makapan's Poort, III. 1894, *Schlechter* 4689 (A, BH, BM, G, K, N, T, V, W, Z); Crecy, *Carver* 12 (N). Pietersburg distr.: Sand Rivier, III. 1895, *Schlechter* 6909 (A, BH, G, K, N, V, Z); Tzaneen, *Sampson* H. 4429 (N). Zoutpansberg distr.: Mara, II. 1935, *de Klerk* 10 (N).

BECHUANALAND PROTECTORATE.

Francistown, IV. 1929, *Gordon* 55 (N); Mahalapye, IV. 1931, *Pole Evans* 3205 (K, N).

TYPE SPECIMEN.

The Syn-types *Schlechter* 4217 et 4689 are deposited in the Botanisches Museum, Zürich.

33. *A. effusa* *Henrard* Crit. Rev. **1.** 155 (1926); *Henrard Monogr.* **2.** 204 cum ic. tab. 92 (1932).

A. Waibeliana *Henrard* Crit. Rev. **3.** 679 (1928); *Henrard Monogr.* **2.** 204 cum ic. tab. 92 (1932).

Annual, slender, erect, including the inflorescence up to 90 cm. high (2-3 ft. fide *Barnard*!). *Culms* elegant, branched from nearly all nodes, about 3-4-noded; nodes conspicuous, glabrous, somewhat swollen; internodes glabrous, up to 15 cm. long, exserted, more or less terete. *Leaf-sheaths* lax, the lower slipping from the stems, keeled, striate, minutely scaberulous; *ligules* densely and shortly ciliate; auricles glabrous to densely ciliate; collar smooth; *blades* linear, gradually narrowed, up to 30 cm. long and up to 3 mm. wide, glabrous or minutely scaberulous on the lower surface, more or less scaberulous and hirtellous on the upper surface, striate, margins thickened. *Panicles* terminal and lateral, very diffuse and open; the terminal 20-30 cm. long or shorter, about 15 cm. wide;

the lateral panicles usually much shorter; axis glabrous; branches solitary or binate, elongate, subcapillary, scaberulous, straight or flexuous, naked in their lower part. *Spikelets* more or less congested towards the end of the branches; pedicels long or somewhat short, scaberulous. *Glumes* about equal or slightly unequal; lower glume lanceolate, purplish, about up to 8.5 mm. long, acute or with an inconspicuous mucro, glabrous in the lower part, scaberulous towards the apex, keel very scabrous especially upwards, 1-nerved; the upper about up to 8 mm. long, purplish or not so, linear lanceolate, of a thinner and more papery texture than the lower glume, truncate or very obtuse at the apex, glabrous, 1-nerved, keel glabrous and smooth. *Lemma* narrowly linear, up to 11.5 mm. long but often very much shorter, tubulous or compressed, hardly narrowed above, pallid or brown, at times mottled, extremely scabrous on the keel upwards and more or less so over the surface in the upper two-thirds; apex of *callus* rounded, obtuse, conspicuous; awns erect straight, or somewhat spreading, scabrous; the central awn about 16 mm. long, the lateral shorter and up to 13 mm. long.

SOUTHERN ANGOLA.

Between Gambos Fort and Mission Station, V. 1909, *Pearson* 2445 (K, N).

SOUTH WEST AFRICA.

Kunene River Banks, *Barnard* 41 (N, S); Grootfontein, II. 1933, *Schoenfelder* 99 (K, N); Otjiwarongo, III. 1928, *Bradfield* 378 (N); Waterberg, V. 1928, *Bradfield* 378 (A, N); Oweipütz, V. 1886, *Marloth* 1379 (N, W); Karibib, IV. 1913, *Engler* 6162 (B); Tsumebpad, IV. 1939, *Volk* 1672 (D); Ozondjache, XII. 1938, *Volk* 538 (D); Asis, III. 1939, *Volk* 770 (D).

TYPE SPECIMEN.

Engler 6162 is deposited in the Botanisches Museum, Berlin-Dahlem.

34. **A. canescens** *Henrard* Crit. Rev. Supplem. 708 (1933); *Henrard* Monogr. 2. 210 et 309 et cum ic. tab. 95 (1932).

A. junciformis Trin. et Rupr. sec. Stent in *Bothalia* 1. IV. 277 (1924) pro parte, non Trin. et Rupr.

Perennial, densely caespitose, with several innovations. *Culms* erect, elegant, simple (very rarely branched), up to 1 m. high, about 4-noded; internodes terete, striate, glabrous or slightly scaberulous below the nodes, exserted; nodes glabrous. *Leaf-sheaths* shorter than the internodes, tight, striate, glabrous or scaberulous, the lower somewhat compressed; *ligule* a ciliolate rim; auricles pubescent, at times bearded with long hairs; collar minutely pubescent; *blades* narrow, linear, coarse, 20 cm. long or much longer, involute, flat only near the base, in robust specimens up to 2-2.5 mm. wide, glabrous or scaberulous on the lower surface, scaberulous on the upper surface, margins thickened and scabrid. *Panicle* erect, lax or contracted but often interrupted and then the spikelets congested, up to 20 cm. long; rachis striate, angular, scabrous; branches somewhat remote, binate or ternate, or solitary upwards, naked at the base over some distance or in some cases shortly peduncled and spikelets densely congested; pedicels short, scaberulous. *Spikelets* erect, pallid or yellowish-green, or tinged with purple. *Glumes* unequal, 1-nerved; the lower 5.5-8 mm. long, laterally compressed, keeled, scaberulous on the keel and minutely so on the flanks, emarginate at the apex or sometimes with a short mucro from the bilobed apex; the upper 8-11 mm. long, truncate at the apex or shortly mucronate from a subbilobed apex; smooth on flanks and keel. *Lemma* 7-11 mm. long, somewhat laterally compressed, smooth or sometimes scaberulous on the keel, narrowed upwards but not forming a column; *callus* \pm 1 mm. long, obtuse, densely or shortly bearded; awns flattened, scabrous, erect or slightly spreading, subequal, the central 9-15 mm. long, the lateral 7-13 mm. long.

CAPE PROVINCE.

Vryburg distr.: Vryburg, Armoedsvlakte, III. 1920, *Theiler* H. 20182 (N) et H. 20240 (N). Taungs distr.: Dryharts, I. 1923, *Henrici* 39 (N).

ORANGE FREE STATE.

Bloemfontein distr. : Bloemfontein, III. 1917, *Potts* 2407 (K, N, W) et 2894 (K) ; Glen, III. 1926, *Agricult. School* 3447 (N). Kroonstad distr. : Vals Rivier, II. 1929, *Pont* 149 (GU, N, Z). Heilbron distr. : Heilbron, I. 1931, *Goossens* 425a (GU, N, W) et 566 (GU, N, W). Vredefort distr. : Reitzburg, II. 1937, *Bunting* 113 (N) ; Schoemans drift, II. 1937, *Bunting* 108 (N).

TRANSVAAL PROVINCE.

Bloemhof distr. : Christiana, III. 1912, *Burt Davy* 13057 (N) ; Kameelpan, I. 1934, *Theron* 548 (N) et 550 (N). Wolmaransstad distr. : Wolmaransstad, *Cronje* 7643 (K, N). Potchefstroom distr. : Ventersdorp, III. 1931, *Pole Evans* 3143 (B, N) ; Machavie, III. 1927, *Lane* 9 et 9b et 14 et 18 (omnes N) ; Klerksdorp, IV. 1937, *Rose Innes* 964 (N) et 965 (N) ; Rhenosterfontein, IV. 1937, *Rose Innes* 966 (N). Vereeniging distr. : Leeuwkuil, *Bunting* 136 (N). Krugersdorp distr. : Hekpoort, IV. 1936, *Bunting* 44 (N) et 30 (N) et VIII. 1936, *Bunting* 47 (N). Pretoria distr. : Pretoria, II. 1933, *Phillips* 3625 (N) ; do., XII. 1933, *Barrie* in Hb. Stell. 19671 (St). Waterberg distr. : Warmbaths, II. 1921, *Stent* H. 21573 (N, W) ; do., I. 1936, *Irvine* 15 (N) ; Nylstroom, IV. 1927, *Straker* 11 (K, N) ; Naboomspruit, III. 1919, *Galpin* M. 426 (N).

TYPE SPECIMEN.

Cronje 7643 is deposited in The Herbarium, Royal Bot. Gardens, Kew.

COMMON NAMES.

Steekgras(s).

ECONOMIC NOTES.

This species is very wiry and thus unpalatable.

35. **A. monticola** *Henrard* Crit. Rev. 2. 355 (1927) ; *Henrard Monogr.* 2. 220 cum ic. tab. 101 (1932).

Perennial, usually caespitose, but sometimes assuming an almost creeping habit, rooting at the lowermost nodes. *Culms* erect or geniculately ascending, including the panicle up to 80 cm. high, many-noded, usually giving rise to branches at the nodes ; internodes elegant, terete, wiry, scarcely 1 mm. thick, glabrous, striate, exserted. *Leaf-sheaths* short or about one half the length of the internodes, terete, tight, glabrous and striate. *Ligule* a thickened shortly ciliolate rim ; auricles long-bearded ; collar glabrous ; *blades* narrow linear, flat or convolute at the base, glaucous, up to 12 cm. long and 2 mm. wide, glabrous on the lower surface, upper surface scaberulous and at times with some scattered long hairs, margins markedly thickened, acute, curved or flexuous. *Panicle* erect, lanceolate in outline, up to 14 cm. long ; rhachis scaberulous and striate ; branches usually binate, scaberulous, striate, ascending or almost adpressed ; pedicels longer or shorter than the glumes. *Spikelets* erect, dull purplish-brown. *Glumes* linear-lanceolate, 1-nerved ; the lower 6-8.5 mm. long, shortly awned, glabrous except for the scabrous keel ; the upper glabrous, 5-6 mm. long, bidentate at the apex with a very short mucro from the sinus. *Lemma* tubulous, purple, smooth, 6-6.5 mm. long, produced into a distinctly twisted short scabrous column ; *callus* very short, rounded, obtuse, long-bearded ; awns unequal, sub-erect or divergent, the central up to 18 mm. long, the lateral branches up to 13 mm. long.

NATAL PROVINCE.

Ipolela distr. : Underberg, III. 1938, *McClellan* 683 (N). Bergville distr. : Mt. Aux Sources, IV. 1919, *Mogg* 5282 (N) et H. 20634 (K, N) ; do., II. 1926, *Bayer et McClellan* 154 (K, N) et 157 (K, N). Champagne Castle, X. 1933, *Meebold* NH. 15728 (N).

TYPE SPECIMEN.

Mogg H. 20634 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

ECONOMIC NOTES.

This species has a very restricted geographic distribution. It has so far only been recorded from the Drakensberg area in Natal. The plants often form a dense tangle along the banks of streams and are also commonly met with in the more open parts of the bush along the mountain gulleys.

36. *A. junciformis* Trin. et Rupr. Spec. Gram. Stip. 143 (1842); Walp. Ann. Bot. **3**. 745 (1852); Steud. Syn. Pl. Glum. **1**. 140 (1854); Dur. et Schinz, Consp. **5**. 804 (1894); Stapf in Dyer, Fl. Cap. **7**. 556 (1899); Stent in Bothalia **1**. IV. 277 (1924) pro parte; Henrard Crit. Rev. **2**. 273 (1927); Henrard Monogr. **2**. 287 cum ic. tab. 140 (1932); Obermeijer, Schweickerdt et Verdoorn in Bothalia **3**. II. 227 (1937).

A. Adscensionis Linn. sec. Phillips in Ann. S. Afr. Mus. **16**. 346 (1917) pro parte, non Linn. *A. angustata* Stapf in Dyer, Fl. Cap. **7**. 556 (1899); Phillips in Ann. S. Afr. Mus. **16**. 346 (1917); Henrard Crit. Rev. **1**. 26 (1926). *A. Burkei* Stapf sec. Phillips in Ann. S. Afr. Mus. **16**. 347 (1917) pro parte, non Stapf. *A. Welwitschii* Rendle, Cat. Afr. Pl. Welw. **2**. I. 202 (1899); Henrard Crit. Rev. **3**. 682 (1928); Henrard Monogr. **2**. 228 cum ic. tab. 107 (1932); Theron in Fedde, Rep. **40**. 21 (1936) [*sphalm. Welwitschia*].

Perennial, loosely to densely caespitose. *Culms* fascicled, erect, simple or scantily branched, wiry, 3-4-noded, up to 60 cm. high; internodes exerted, glabrous, compressed below the nodes; nodes slightly swollen, glabrous. *Leaf-sheaths* tight, the lower often keeled, glabrous or woolly, at times slipping from the internodes; *ligule* a short ciliate rim; auricles bearded or even glabrous; collar glabrous; *blades* very narrow, gradually passing into the sheaths, subsetaceous, convolute or folded below, fairly rigid or curved or flexuous, up to 30 cm. long and 1 mm. wide, smooth on the lower surface, scaberulous to densely pubescent above. *Panicle* narrow, up to 20 cm. long and 1-3 cm. broad, erect or somewhat nodding, rhachis straight or flexuous, angular; branches solitary, up to 5 cm. long, usually scantily branched from the base; branchlets scaberulous; pedicels short or almost 0. *Spikelets* purplish to green or pallid, 7-11 mm. long, congested at the tips of the branches. *Glumes* unequal, linear-lanceolate, thin, glabrous or minutely pubescent, subacute to acute and awned; the lower 4-9 mm. long, scabrous dorsally and on the keel; the upper 8-12 mm. long, awned. *Lemma* linear, tubular, up to 9 mm. long including the column, smooth or scaberulous below the column; *callus* about 0.5 mm. long, obtuse; column of awns present and well-developed or almost 0; central awn 12-35 mm. long; lateral awns 9-28 mm. long.

SOUTH WEST AFRICA.

Otjijongombe, II. 1939, *Volk* 1175 (D); Okavango river, anno 1939, *Volk* 2146 (D).

CAPE PROVINCE.

Ceres distr.: Koudebokkeveld, Schurfdeberg, I. 1897, *Schlechter* 10184 (A, B, BH, BM, G, N, P, T, W, Z); Matroosberg, I. 1917, *Phillips* 2108 (S). Tulbagh distr.: Tulbagh, II. 1896, *Schlechter* 7509 (A, B, BH, BM, K, P, T, V, W, Z). Worcester distr.: Worcester, *Rehmann* 2582 (BM, Z) et 2587 (K, BM, Z) et 2667 (K, BM, Z). Paarl distr.: Bainskloof, II. 1897, *Schlechter* 10258 (A, B, BH, BM, G, N, P, V, W, Z); do., IV. 1915, *Bolus* 14742 (BH, Z). Stellenbosch distr.: Stellenbosch, anno 1925, *Duthie* 1658 et 1658a (Sreg); do., anno 1926, *Duthie* in Hb. Stell. 1476 (Sreg). Cape distr.: Cape Peninsula, II. 1897, *Wolley-Dod* 2387 (BH, BM) et 2388 (BH, BM); do., *Hitchcock* 24059 (K, N, W); do., *Bolus* 14703 (A, BH, K, N, T, Z) et 21785 (BH); do., VIII. 1936, *Acock* 679 (Mc); do., IV. 1936, *Adamson* 897 (U); do., III. 1922, *Pole Evans* 492 (N). Caledon distr.: Palmiet Rivier, II. 1932, *Levyms* 3841 (U); Rivierzondereinde, I. 1896, *Schlechter* 9896 (A, B, BH, BM, G, N, P, T, V, W, Z). Swellendam distr.: Grootvaderbosch, *Marloth* 3706 (B, N); Buffeljagtrivier, I. 1893, *Schlechter* 2073 (A, B, BM, G, K, P, V, Z); Zuurbraak, I. 1893, *Schlechter* 2121 (A, B, BH, BM, G, K, P, V, Z). Riversdale distr.: Riversdale, IV. 1926, *Muir* 3616 (N) et 3910 (N). George distr.: George, III. 1893, *Schlechter* 2403 (A, B, BH, BM, G, K, P, V, Z); do., VIII. 1935, *Baker* 19 (N). Humansdorp distr.: Between

Essenbosch and Two Streams, V. 1923, *Fourcade* 2543 (K, N). Uitenhage distr. : Thornhill, III. 1911, *Pillans* 1788 (K, N). Port Elizabeth distr. : Port Elizabeth, V. 1902, *Galpin* 6385 (A, N). Albany distr. : Albany, *Bowie* 23 (BM). East London distr. : Near East London, III. 1890, *Sim* 29 (Z). Kingwilliamstown distr. : Kei Road, II. 1928, *Ranger* 51 (N); *Perie*, XI. 1901, *Sim* 2835 (A, BM). Cathcart distr. : Windvogelsberg, *Baur* 1115 (A, K). Queenstown distr. : Sterkstroom, XI. 1901, *Sim* 2734 (A) et 2735 (A). Komgha distr. : Komgha, III. 1893, *Flanagan* 1777 (A, BH, N) et II. 1894, *Flanagan* 2218 (A, N). Kentani distr. : Kentani, *Pegler* 238 (A, BH, N). Engcobo distr. : Near Engcobo, I. 1896, *Flanagan* 2799 (BH, K, N). Lusikisiki distr. : Port St. Johns, IV. 1899, *Galpin* 2875 (A, K, N). Maclear distr. : Maclear, III. 1904, *Galpin* 6901 (A, B, BH, D, K, N, S); do., I. 1923, *Britten* 4542 (A) et 4607 (A). Without precise locality : *Carmichael* s.n. (BM); Pondoland, *Bachmann* 168 (B) et 169 (B) et 170 (B).

NATAL PROVINCE.

Richmond distr. : Richmond, III. 1934, *Lynes* 650a (BM). Durban distr. : Port Natal, *Drège* (B, LG, N, V); Durban, *Williamson* 34 (K); do., *Kuntze* s.n. (K); do., *Plant* 61 (BM, K, O, P, V); do., *Grant* s.n. (K); do., *Schweickerdt* 1349 et 1351-1353 (B, D, K, L, P, V, W, Z). Inanda distr. : Inanda, *Rehmann* 8251 (V, Z). Camperdown distr. : Varkkop (Vaalkop?), *Rehmann* 7665 (A, BH, BM, V, Z). Pietermaritzburg distr. : Pietermaritzburg, III. 1926, *McClellan* 198 (K, W); do., Fort Napier, *Steinbart* s.n. (B). Lions River distr. : Karkloof, IV. 1896, *Wylie* 7691 (D); Balgowan, IV. 1919, *Mogg* 3877 (N) et 3878 (N). Lidgetton, IV. 1917, *Mogg* 544 (N). Estcourt distr. : Mooi River, V. 1917, *Mogg* 126 (N) et III. 1920, *Mogg* 7249 (N); do., XII. 1928, *Mason* 4 (D, K); do., *Rehmann* 7342 (B, BM, K, Z); Giant's Castle, XII. 1914, *Symons* 279 (T). Bergville distr. : Mt. Aux Sources, IV. 1919, *Mogg* 5310 (N); do., II. 1926, *Bayer* et *McClellan* 219 (K, N). Dundee distr. : Near Dundee, *Medley Wood* 7449 (K). Newcastle distr. : Mount Prospect, *Bunting* 177 et 181 (N). Zululand : Entonjaneni distr. : Melmoth, V. 1919, *Mogg* H. 20041 (N, W). Lower Umfolozi distr. : Mtunzini, V. 1919, *Mogg* H. 20040 (N). Without precise locality : *Hutton* 327 (A, V); *Buchanan* 1 (K); *Sutherland* s.n. (K); *Plant* 11 (G); *Jenkinson* 64 (D, K).

BASUTOLAND.

Leribe distr. : Leribe, *Dieterlen* 199b (K, N, P, V, W); do., II. 1913, *Phillips* 638 (K, S) et 692 (S) et 734 (S) et 741 (S) et 790 (S) et 919 (S).

ORANGE FREE STATE.

Senekal distr. : Doornkop, XII. 1931, *Goossens* 889 (B, K, N, W); Wonderkop, XII. 1931, *Goossens* 834 (K, N) et 841 (K, N). Bethlehem distr. : Bethlehem, II. 1919, *Potts* 4517 (GU, N); do., *Richardson* s.n. (B, K, P, V, W, Z). Kroonstad distr. : Bothaville, I. 1933, *Goossens* 1179 (B, N). Heilbron distr. : Viljoensdrift, I. 1912, *Rogers* 4824 (A, K, T). Vrede distr. : Vrede, V. 1937, *Bunting* 185 (N). Without precise locality : *Buchanan* 55 (D) et 64 (D) et 67 (BH, D, K) et 289 (D, K).

TRANSVAAL PROVINCE.

Wakkerstroom distr. : Amersfoort, III. 1917, *Burt Davy* 17362 (K). Ermelo distr. : Ermelo, III. 1917, *Burt Davy* 17426 (W) et 17467 (K); do., II. 1910, *Burt Davy* 9267 (N) et 9320 (N) et I. 1904, *Burt Davy* 950 (N); do., XII. 1926, *Henrici* 1217 (N); do., I. 1936, *Norval* 102 (N); Lake Chrissie, III. 1904, *Hamilton* H. 994 (N) et IV. 1910, *Hamilton* 5913 (N). Standerton distr. : Standerton, V. 1937, *Bunting* 123 (N). Heidelberg distr. : Henley-on-Klip, II. 1922, *Stent* H. 21135 (N); Uitgevalen, XII. 1909, *Burt Davy* 9185 (N). Vereeniging distr. : Vereeniging, II. 1917, *Burt Davy* 17093 (BH, K) et III. 1917, *Burt Davy* 17206 (BH, K). Leeuwkuil, XII. 1935, *Story* 5 (N). Johannesburg distr. : Johannesburg, XI. 1902, *Rand* 1044 (BM); Frankenwald, I. 1937, *Bunting* 90 (N). Pretoria distr. : Pretoria, XII. 1917, *Burt Davy* 7494 (N); Koedoespoort, *Rehmann* 4640 (B, V); do., XI. 1915, *Mogg* 11798 (N). Zilikaatsnek, IV. 1918, *Pole Evans* H. 17587

(N); Irene, I. 1922, *Pole Evans* 359 (N). Rustenburg distr.: Holfontein, *Nelson* 79 (K). Waterberg distr.: Elandspruitbergen, XII. 1893, *Schlechter* 3998 (A, B, BH, BM, G, K, T, V, Z); Warmbaths, II. 1921, *Stent* H. 21450 (N); Naboomspruit, IV. 1924, *Galpin* H. 712 (N) et II. 1919, *Galpin* M. 423 (K, N); Pietpotgietersrust, III. 1921, *Galpin* 8889 (K); Pongola River, XII. 1919, *Burt Davy* 18264 (K). Pietersburg distr.: Houtbosch, *Rehmann* 5665 (Z) et 6567 (K, V, Z). Zoutpansberg distr.: Zoutpan, IV. 1934, *Schweickerdt et Verdoorn* 572 (N, B).

BECHUANALAND PROTECTORATE.

Kanye, III. 1937, *Bunting* 132 (N).

TYPE SPECIMEN.

Drège (Port Natal?) is deposited in the Trinius Herbarium, Leningrad.

COMMON NAMES.

Heigras. Koperdraat. Wire-grass.

ECONOMIC NOTES.

This species is tough and wiry and thus from a forage point of view, useless.

REMARKS.

The spikelets of this species show a great deal of variation. One and the same specimen (*Flanagan* 2218) shows the following ranges: Lower glume 7–9 mm., upper glume 8–12 mm., lemma 6–9 mm., central awn 12–34 mm., and lateral awns 9–28 mm. long. The length of the column likewise is extremely variable. *Galpin* 6901 shows the presence of spikelets in which the column is well-developed and exerted beyond the glumes, whereas in others of the same gathering the column is only weakly developed and thus not exerted beyond the glumes.

From the foregoing synonymy it is evident that I do not consider *A. angustata* Stapf to be specifically distinct from *A. junciformis*. The reason is that *Wolley-Dod* 2387 and *Rehmann* 2582, syn-lectotypes of *Henrard*, have culms which are distinctly compressed below the nodes, furthermore the lemmas are not always exerted beyond the shortly mucronate glumes. The most important characters of distinction thus break down.

Examination of *Rendle's* types of *A. Welwitschii* in the British Museum have also revealed the presence of culms which are compressed below the nodes. This also holds good for the *var. minor* of *Rendle*. These specimens are not distinguishable from *A. junciformis* on the character just mentioned.

Since *Henrard* considers *A. Welwitschii* to be synonymous with *A. angustata* and on which point I fully agree, I have not been able to arrive at a view other than that expressed in the synonymy cited above for this species.

37. **A. transvaalensis** *Henrard* Crit. Rev. Suppl. 742 (1933); *Henrard* Monogr. 2. 235 cum ic. tab. 111 (1932).

Densely caespitose *perennial*. Culms erect, simple below, branched from most of the nodes, more rarely simple, erect, elegant, few to many-noded, including the panicles up to 70 cm. high; internodes glaucous, striate, terete, smooth or very minutely scaberulous, exerted from the leaf sheaths, lowermost internode usually long (up to 30 cm. !); nodes inconspicuous, glabrous. *Basal leaves* pallid, slipping from the stems; lower sheaths striate, somewhat compressed or subterete, glabrous, with somewhat hyaline margins; the upper sheaths lax and slipping from the internodes or fairly tight and not slipping from the internodes; *ligule* minute and shortly ciliolate; auricles minutely bearded; collar glabrous; the basal blades soon dying off, linear, acute, recurved or flexuous, striate, lower surface glabrous, scabrous on the upper surface, convolute; the upper narrow convolute about 1 mm. wide (when opened out), setaceous, acute, flexuous or somewhat curved,

up to 15 cm. long, striate, glabrous beneath, scaberulous and with prominently thickened marginal veins above, margins minutely serrate. *Panicle* narrow, somewhat lax, up to 8 cm. long, scarcely or well-exserted; axis more or less terete or subangular, scaberulous or smooth; branches solitary, bipartite from the base, up to 2.5 cm. long, erect and adpressed, bearing spikelets to the base or shortly peduncled and with erect branchlets; pedicels scabrous. *Spikelets* congested, shortly pedicelled, pallid or dull-purplish or greenish, small, erect. *Glumes* lanceolate, unequal, 1-nerved, acute; the lower 5–9 mm. long, shortly awned, upwards scabrous on the keel; the upper 6.5–10 mm. long, minutely subtruncate at the apex and awned, glabrous on the keel. *Lemma* smooth, minutely granular upwards, tubulous, together with the column up to 11.5 mm. long, narrowed above and stipitate or with a well-developed column; *callus* very short (0.3 mm.), very obtuse, almost truncate, densely hairy; column 1–5.5 mm. long, scabrous, twisted; awns unequal, scabrous; the central divergent (almost geniculately so) and 6–13 mm. long; the lateral at times absent, more usually present and up to 8 mm. long.

NATAL PROVINCE.

Newcastle distr.: Mount Prospect, V. 1937, *Bunting* 177 (N).

TRANSVAAL PROVINCE.

Potchefstroom distr.: Klerksdorp, XI. 1937, *Bunting* 158 (N). Krugersdorp distr.: Krugersdorp, II. 1937, *Bunting* 139 (N) et 141 (N). Johannesburg distr.: Johannesburg, III. 1920, *Burt Davy* 18880 (K, N); do., V. 1915, *Burt Davy* 15255 (BH, N); do., VII. 1929, *Hitchcock* 24116 (K, N, W); do., I. 1919, *Bryant* A. 25 (N, W); do., IV. 1927, *Moss* 14258 (WR); do., I. 1922, *Moss* 6337 (WR); do., III. 1920, *Moss* 3575 (K, WR, W); Frankenwald, II. 1937, *Bunting* 95 et 97 et 164 et 188 (omnes N). Pretoria distr.: Pretoria, IX. 1905, *Engler* 2761 (B); Wonderboom, IV. 1932, *Smith* 6113 (N) et 6198 (K, N); do., II. 1933, *Phillips* 3524 (N). Koedoespoort, *Rehmann* 4620 (Z); do., II. 1939, *Schweickerdt* 1327 et 1331 et 1332 (omnes B, K, N, W); Baviaanspoort, IV. 1927, *Moss* 14259 (K, N, WR). Barberton distr.: Barberton, V. 1930, *Thorncroft* 21 (B, K, N).

BECHUANALAND PROTECTORATE.

Kanye, III. 1937, *Bunting* 132 (N).

TYPE SPECIMEN.

Moss 14259 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

ECONOMIC NOTES.

Owing to the wiry nature of the culms and the scantiness of leaf, this species most probably is unpalatable.

REMARKS.

In this species the lateral awns are not always well-developed. *Thorncroft* 21 has several inflorescences in which they are absent or merely weakly developed, so that the spikelets superficially resemble those of *Stipa parvula* Nees. The same gathering also shows inflorescences with lemmas in which the lateral awns are well-developed, thus proving that the length of the lateral awns is extremely variable. The length of the column of the awns is likewise extremely variable even in one and the same individual.

This species grows in close proximity to *A. aequiglumis* Hack. but may be distinguished from this by the comparatively more-contracted inflorescence and smaller spikelets. The branching of the culms is not a critical character since it also occurs in *A. aequiglumis* though far less frequently so. *A. transvaalensis* is very commonly met with on the northern slopes of the Magaliesberg where it grows in the crevices on quartzite and forms dense tussocks.

38. *A. aequiglumis* Hack. in Bull. Herb. Boiss. 3. 381 (1895); Stapf in Dyer, Fl. Cap. 7. 555 (1899); Henrard Crit. Rev. 1. 18 (1926); Henrard Monogr. 2. 236 cum ic. tab. 112 (1932); Theron in Fedde, Rep. 40. 21 (1936).

Perennial, densely caespitose, up to 70 cm. high, but usually much smaller. *Culms* slender, simple, erect, terete, 3-4-noded, rarely branched from the nodes; internodes glabrous, striate, exserted. *Leaf-sheaths* persistent, shorter than the internodes, striate glabrous, the lower pallid; *ligule* a minutely ciliolate rim; auricles minutely pubescent, more rarely bearded with a few long white hairs; *blades* setaceous, convolute, rather firm, recurved or flexuous, up to 15 cm. long but often much shorter, finely striate and glabrous on the lower surface, minutely pubescent and striate on the upper surface, margins scabrous. *Panicle* linear-oblong, contracted or lax and open but never spike-like, about 10 cm. long, rarely somewhat longer; rhachis filiform; branches remotely 2-3-nate or the upper solitary, erect and almost adpressed to the rhachis, the longest up to 6 cm. long, usually branched from near the middle and bearing 1-3 spikelets on short scaberulous pedicels. *Glumes* linear-lanceolate, 1-nerved; the lower rather broad at the base, 7-11 mm. long, with a prominent and scabrous or glabrous midrib, acute or shortly mucronate from a minutely 2-lobed apex, dorsally minutely scaberulous to conspicuously scabrid-hairy on the flanks, usually somewhat recurved near the apex; the upper 7-11.5 mm. long, midrib conspicuous and glabrous, scaberulous dorsally and often scabrid-hairy on the flanks, shortly mucronate from a minutely 2-lobed apex, often recurved at the apex. *Lemma* linear-convolute, including the callus and twisted scaberulous column from 8-16 mm. long, dorsally minutely scaberulous upwards; column 2-8 mm. long; awns capillary, suberect or slightly spreading, scaberulous; the central 15-30 mm. long; the lateral awns somewhat shorter, 14-28 mm., long. *Anthers* 4 mm. long, pale yellow to purple. *Stigmas* an intense purple, 2.5 mm. long.

TRANSVAAL PROVINCE.

Potchefstroom distr.: Losberg, XII. 1934, Theron 941 (T); do., IV. 1937, *Bunting* 166 (N); do., Rhenosterfontein, IV. 1937, *Bunting* 167 (N). Krugersdorp distr.: Hekpoort, V. 1936, *Bunting* 68 (N) et III. 1937, *Bunting* 610 et 148 (N); near Robinson, III. 1928, *Moss* 16501 (K, WR, W). Johannesburg distr.: Johannesburg, XII. 1908, *Leendertz* 1823 (T); do., VII. 1929, *Hitchcock* 24124 (K, N, W); do., II. 1928, *Moss* 16250 (K, N, WU); do., IV. 1911, *Pillans* 1814 (K); do., III. 1920, *Burt Davy* 18907 (K); Frankenswald, II. 1937, *Bunting* 96 (N) et 99 (N); Witwatersrand, IV. 1895, *Hutton* 883 (A). Pretoria distr.: Pretoria, *Pont* 958 (Z) et 1076 (Z); do., IV. 1930, *Mogg* 8440 (K, N); do., I. 1894, *Schlechter* 4150 (Z); Koedoespoort, *Rehmann* 4696 (B, K, N, V, Z); do., II. 1929, *Stent et Mogg* 8099 (N); do., III. 1939, *Schweickerdt* 1342-1344 (K, N, B, V, W); Saartjiesnek off Pelindaba Road, II. 1939, *Schweickerdt* 1328 et 1329 et 1330 (omnes B, K, N, W). Middelburg distr.: Wilge Rivier, I. 1894, *Schlechter* 4129 (A, BH, BM, K, N, T, V) et 4129a (Z); Balmoral, IV. 1917, *Pole Evans* H. 11638 (K). Waterberg distr.: Nylstroom, IV. 1932, *Skead* 30 (N); Naboomspruit, IV. 1924, *Galpin* M. 713 (N).

TYPE SPECIMEN.

Rehmann 4696 is deposited in the Naturhistorisches Museum, Wien.

REMARKS.

Henrard in his Monogr. 2. 236 states the lower glume to be "glabrous and smooth, minutely pubescent only at the tip". He uses this as a diagnostic character to distinguish between *A. aequiglumis* and *A. huillensis*. Careful examination of Hackel's type has shown that the lower glume is often scaberulous on both the keel and the flanks and also from the base upwards. A drawing made by Stapf of some of the type gathering in Herb. Kew. also shows the glumes to be scaberulous. In the various sheets enumerated above I have found the lower glume to be scaberulous or even shortly hairy dorsally to a greater or lesser degree. Some spikelets may be almost glabrous and smooth (*Hutton* 883) whereas in the same gathering others again are markedly hairy. It thus appears that the degree

of indumentum of the glumes is of relatively little taxonomic importance. As some specimens of *A. aequiglumis* have branched culms and this is always met with in *A. huillensis*, it is extremely doubtful whether these plants really represent distinct species.

A wide range of material from the type locality and another locality has been collected recently by the author of this paper. These specimens clearly show the range in variation of the species.

39. *A. rhiniochloa* Hochst. in Flora **38**. 200 (1855); Dur. et Schinz, Consp. **5**. 808 (1894) [sphalm. *rhinochloa*]; Dinter in Fedde, Rep. **15**. 342 (1918) [sphalm. *rhinochloa*]; Henrard Crit. Rev. **3**. 510 (1928); Henrard Monogr. **2**. 242 cum ic. tab. 115 (1932); Range in Fedde, Rep. **33**. 9 (1933).

A. rigidiseta Pilger in Engl. Bot. Jahrb. **51**. 413 (1914); Garabedian in Ann. S. Afr. Mus. **16**. II. 404 (1925); Henrard Crit. Rev. **3**. 516 (1928).

Erect *annual*, branched from the base and not infrequently from the lower and middle nodes. *Culms* usually erect, very rarely geniculately ascending, 3 to many-noded; internodes, terete, exceeding the lower leaf-sheaths, retrorsely scabrous, striate; nodes minutely pubescent. Lower *leaf-sheaths* usually slipping off the stem, compressed, keeled, striate, scabrous, the upper likewise but usually exceeding the internodes; *ligule* long-ciliate; auricles long-bearded; *blades* flat, up to 20 cm. long and 4 mm. wide, glaucous, many-nerved, very scabrous on both surfaces, acute but not pungent. *Panicle* effuse or contracted, up to 30 cm. long; axis very scabrous, striate; branches scabrous, the axils densely shortly hairy, binate, more or less peduncled with 1 or 2 few-flowered short branchlets at the base, upper branches shortly peduncled mostly solitary, bearing clustered spikelets on subsessile pedicels or some of them with well-developed pedicels. *Spikelets* coarse, pallid or purplish-brown, flushed with purple towards the base of the glumes. *Glumes* broad, very acute, shortly hairy on the back, 1-nerved, keels somewhat scabrous, awned; the lower broadly lanceolate, acuminate, including the awn up to 17 mm. long, but usually about 13 mm. long; the upper broadly-lanceolate, with two lateral teeth at the apex below the awn, up to 15 mm. long or somewhat shorter. *Lemma* including the densely hairy subobtuse callus up to 13.5 mm. long, usually somewhat shorter (11 mm.), strongly nerved, the nerves with rows of aculeolate antrorsely curved hyaline sharp hairs, keeled dorsally and deeply grooved ventrally with inrolled margins; awns very scabrous, rigid, triquetrous, almost winged at the base, erect or spreading, subequal or the central somewhat longer, 18–30 mm. long or at times up to 40 mm. long.

SOUTH WEST AFRICA.

Otjikuara-Okaharui, III. 1913, *Dinter* 3292 (B); Otavi, III. 1925, *Dinter* 5754 (BH, G, GU, N, S, Z); Omuramba und Omatako, III. 1912, *Seiner* 691 a (41 a) (B); Okahandja, *Dinter* 1551 (B); do., II. 1928, *Bradfield* 393 (N) et V. 1928, *Bradfield* 393 a (K, N), Okahandja-Otjisara, III. 1912, *Dinter* 2535 (B); Okawaka, I. 1939, *Volk* 598 (D); Otjiputo: II. 1939, *Volk* 1251 (D); Otjenga, III. 1939, *Volk* 1395 (D).

TRANSSVAAL PROVINCE.

Waterberg distr.: Crecy, *Carver* 20 (N) et 24 (N). Zoutpansberg distr.: Messina, X. 1929, *Turner* 16 (N).

BECHUANALAND PROTECTORATE.

Francistown, IV. 1929, *Gordon* 66 (N).

TYPE SPECIMEN.

The whereabouts of the actual type, *Buchinger* 1229 leg. *Schimper*, is not known, although duplicates of the type are deposited in several herbaria (B, P?).

40. *A. andoniensis* *Henrard* Crit. Rev. 3. 691 (1928); *Henrard* Monogr. 2. 243 (1932).

The habit of this interesting species is not known since it has been described from incomplete material. *Panicle* up to 28 cm. long and 2 cm. wide. *Culms* puberulous and striate below the panicle; *rhachis* puberulous, striate and angular; branches binate, erect, naked at the base for 1.5–2 cm., axils minutely pubescent; pedicels scabrous, the lateral very short, the terminal up to as long as the glumes. *Spikelets* purple. *Glumes* subequal; the lower 15–16 mm. long, dorsally pubescent, acute, shortly awned; upper glume 14 mm. long, with a 1 mm. long awn from the bifid apex. *Lemma* including the callus up to 12 mm. long, margins inrolled, furrowed ventrally, slightly keeled, glabrous and smooth, minutely scaberulous on the keel; *callus* obtuse, about 1 mm. long; awns erect, triquetrous, winged, very scabrous, up to 30 mm. long.

SOUTH WEST AFRICA.

Andoni, anno 1921, *Barnard* 814 (K, N, S).

TYPE SPECIMEN.

Barnard 814 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

REMARKS.

This species is only known from the above type gathering which consists of rather incomplete material.

41. *A. Hubbardiana* *Schweickerdt* in Notizbl. Bot. Garten u. Mus. Berlin—Dahlem. 14. nr. 122. 196 (1938).

A slender *annual*. *Culms* erect or somewhat geniculately ascending, up to 50 cm. high, not very rigid, about 7-noded, markedly branched from the nodes; internodes up to 10 cm. long, always exserted, subterete or compressed, striate and glabrous; nodes glabrous and always exserted. *Leaf-sheaths* about 2.5–3 cm. long, glabrous, striate, compressed, slightly keeled, lax, scaberulous towards the margin, always shorter than the respective internode and smooth. *Ligule* reduced to a ring of short hairs; auricles glabrous more rarely somewhat bearded. *Leaf-blades* up to 12 cm. long but often much shorter, flat or conduplicate, about 2 mm. wide, the margins minutely scaberulous and involute upwards, glabrous and striate on the lower surface, upper surface striate, minutely scaberulous and bearing a few long hairs towards the ligule. *Panicle* well-exserted, up to 6 cm. long, densely glomerate and spike-like, obovate in outline; *rhachis* striate, angular; branches very short and scaberulous. *Spikelets* densely congested, subsessile, lanceolate. *Glumes* about 7 mm. long, subequal, linear-lanceolate; the lower awned often from a bifid apex, awn and keel scaberulous, minutely scaberulous upwards towards the margin; the upper emarginate and shortly awned, keel glabrous, slightly scaberulous upwards towards the margin. *Lemma* lanceolate, up to 7 mm. long, 3-nerved, markedly scabrous in its upper two-thirds, glabrous towards the base, the margins more or less involute. *Callus* very short, rounded, densely bearded. Awns scabrous, up to 30 mm. long, the lateral often much shorter.

SOUTH WEST AFRICA.

Tsumeb, IV. 1934, *Dinter* 7600 (B); Ossa, III. 1939, *Volk* 1557 (D).

TYPE SPECIMEN.

Dinter 7600 is deposited in the Botanisches Museum, Berlin-Dahlem. This species bears a superficial resemblance to *A. hordeacea* Kunth which, however, belongs to § *Pseudochaetaria* whereas *A. Hubbardiana* mihi must be placed in § *Chaetaria* owing to the absence of an articulation in the lemma. The nearest ally to our species is *A. elliptica* (Nees) Kunth from which it differs in several minor characters. This is another of the rather remarkable cases where two closely allied species are found in South America and Western Africa, respectively!

42. *A. recta* Franchet in Bull. Soc. d'Autun 8. 365 (1896); Henrard Crit. Rev. 3. 500 (1928); Henrard Monogr. 2. 261 cum ic. tab. 125 (1932); Theron in Fedde, Rep. 40. 22 (1936).

A. atroviolacea Hack. apud Schinz in Bull. Herb. Boiss. Ser. 2. 6. 707 (1906); Henrard Crit. Rev. 1. 45 (1926). *A. Gossweileri* Pilger in Engl. Bot. Jahrb. 39. 598 (1907); Henrard Crit. Rev. 1. 206 (1926). *A. Hockii* De Wilde in Bull. Jard. Bot. Brux. 6. 39 et tab. 35 fig. 1-6 (1919); Henrard Crit. Rev. 2. 237 (1927).

Perennial, densely caespitose, erect; innovations intravaginal. *Culms* erect, exerted, elegant, 10-30 cm. high, simple, glabrous, striate, subcompressed, 1-(2)-noded; internodes included. *Leaf-sheaths* subterete, glabrous, striate; the lower somewhat lax and eventually breaking up into fibres; the upper somewhat tighter and with a submembranous margin; *ligule* a ciliolate rim; auricles bearded; collar smooth; *blades* basal, setaceous involute, about up to 20 cm. long (often much shorter) and up to 1 mm. wide, striate, smooth on the lower surface, upper surface scaberulous, subobtuse or acute, often somewhat curved or flexuous. *Panicle* ovate-lanceolate in outline, up to 8 cm. long and 4 cm. wide, lax but not very diffuse; axis filiform, smooth, scaberulous upwards, straight or more usually somewhat flexuous; branches capillary, scaberulous, flexuous, ascending, binate or 3-5-partite, naked in their lower half to one-third, the lower branches up to 3 cm. long, the upper much shorter; pedicels much longer to shorter than the glumes. *Spikelets* aggregated towards the end of the branches, brownish-purple to dark-purple. *Glumes* subequal to unequal; the lower lanceolate-ovate, shortly awned, 1-nerved, 3-keeled, scabrous along the keels, 2.5-6 mm. long; the upper linear-lanceolate, shortly awned, 1-nerved, glabrous, 5-7.5 mm. long. *Lemma* tubulous, somewhat narrowed upwards into a short column, smooth, pallid or grey in colour, scaberulous below the awns, 4-5 mm. long; *callus* about 0.25 mm. long, rounded and obtuse, shortly bearded; awns subequal, scabrous, curved or flexuous, purple.

SOUTHERN RHODESIA.

Salisbury, IX. 1919, *Eyles* 1795 (BH, N, S).

TRANSVAAL PROVINCE.

Ermelo distr.: Amsterdam, X. 1935, *Norval* 24 (N). Pretoria distr.: Premier Mine, X. 1917, *Moss* 3165 (N, WR, W).

NATAL PROVINCE.

Newcastle distr.: Newcastle, X. 1893, *Schlechter* 3414 (A, B, BH, BM, G, K, N, P, V, Z).

TYPE SPECIMEN.

Brazza 226 is deposited in the Museum d' Histoire Naturelle, Paris.

43. *A. Galpinii* Stapf in Kew Bull. 1910 p. 130; Phillips in Ann. S. Afr. Mus. 16. 347 (1917); Henrard Crit. Rev. 1. 190 (1926); Henrard Monogr. 2. 305 cum ic. tab. 148 (1932).

Perennial, densely caespitose, leafy, with many innovations. *Culms* erect, simple, up to 45 or 50 cm. high but usually somewhat smaller, very elegant, glabrous, 1-2-noded, more usually one-noded; internodes compressed, striate. *Leaf-sheaths* tight; the lower pallid or often tinged with purple, persistent, striate, glabrous; *ligule* a ciliolate rim; auricles bearded with hairs up to 4 mm. long; collar glabrous; *blades* setaceous, convolute, up to 30 cm. long, acute, somewhat rigid and flexuous, often plicate, glabrous on the lower surface, scaberulous on the upper surface. *Panicle* somewhat contracted, oblong, lax and flexuous; peduncle and axis subterete and striate, scabrous; branches distant, filiform, scaberulous, solitary, about 2-flowered; pedicels scaberulous, unequal, subcompressed and clavate at the apex. *Spikelets* yellowish-brown to purple, suberect. *Glumes* 1-nerved, unequal, lanceolate, more or less abruptly acuminate and mucronate; the lower scabrous on the keel and usually so on the back, 6-10 mm. long; the upper glabrous on the keel

but usually scabrous on the back, 9–14 mm. long. *Lemma* tubulose or lanceolate, narrowed upwards into the short beak, purplish, glabrous or minutely scaberulous dorsally upwards, 7–9 mm. long; *callus* \pm 1 mm. long, shortly and densely bearded, obtuse; awns setaceous, spreading, subequal, the central up to 25 mm. long, the lateral up to 20 mm. long.

CAPE PROVINCE.

Kingwilliamstown distr.: Keiskama Hoek, XII. 1925, *Dyer* 257 (A, N, W); do., II. 1924, *Schönland* 4459 (A); Hogs Back, I. 1920, *Ratray* 440 (A). Stutterheim distr.: Glencairn, IV. 1928, *Galpin* 2417 (A, K, N). Barkly East distr.: Ben McDhui, III. 1904, *Galpin* 6900 (A, B, D, K, N, S). Mount Currie distr.: Kokstad, IV. 1918, *Mogg* 5013 (N).

NATAL PROVINCE.

Bergville distr.: Mt. Aux Sources, II. 1926, *Bayer et McClean* 24 (K, N, W).

BASUTOLAND.

Maluti mountains, *Staples* 112 (N).

TYPE SPECIMEN.

Galpin 6900 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

ECONOMIC NOTES.

This species is considered unpalatable even in the young condition.

44. *A. curvata* (Nees) Trin. et Rupr. Spec. Gram. Stip. 133 (1842); Walp. Ann. Bot. **3**. 743 (1852); Steud. Syn. Pl. Glum. **1**. 138 (1854); Dur. et Schinz, Consp. **5**. 802 (1894); Henrard Crit. Rev. **1**. 124 (1926); Henrard Monogr. **2**. 318 cum ic. tab. 156 (1932); Range in Fedde, Rep. **33**. 8 (1933).

A. curvata (Nees) Trin. et Rupr. var. *nana* (Nees) Henrard Crit. Rev. **3**. 487 (1928); Henrard Monogr. **2**. 318 (1932); Range in Fedde, Rep. **33**. 8 (1933). *A. adscensionis* L. sec. Stapf in Dyer, Fl. Cap. **7**. 554 (1899) excl. syn. pro parte; F. Bolus in Ann. S. Afr. Mus. **9**. IV. 231 (1915) pro parte; Phillips in Ann. S. Afr. Mus. **16**. 346 (1917) pro parte; Garabedian in Ann. S. Afr. Mus. **16**. II. 400 (1925); Stent in Bothalia **1**. IV. 277 (1924), omnes non Linn. *A. adscensionis* L. var. *coerulescens* (Trin. et Rupr.) Dur. et Schinz, Consp. **5**. 799 (1894) pro parte; Hack. in Bull. Herb. Boiss. **4**. Append. III. 19 (1896); Garabedian in Ann. S. Afr. Mus. **16**. II. 400 (1925), omnes non (Trin. et Rupr.) Dur. et Schinz. *A. adscensionis* L. var. *pygmaea* (Trin. et Rupr.) Dur. et Schinz, Consp. **5**. 800 (1894). *A. adscensionis* L. var. *strictiflora* (Trin. et Rupr.) Dur. et Schinz, Consp. **5**. 800 (1894). *A. angustata* Stapf sec. Potts et Tidmarsh in Journ. S. Afr. Bot. **3**. III. 88 (1937), non Stapf. *A. caerulescens* Desf. var. *brevisetata* Hack. in Engl. Bot. Jahrb. **11**. 400 (1889); Henrard Crit. Rev. **3**. 694 (1928). *A. confusa* Trin. et Rupr. Spec. Gram. Stip. 134 (1842); Henrard Crit. **1**. 112 (1926). *A. junciformis* Trin. et Rupr. sec. Stent in Bothalia **1**. IV. 277 (1924) pro parte, non Trin. et Rupr. *A. pusilla* Trin. et Rupr. Spec. Gram. Stip. 140 (1842); Steud. Syn. Pl. Glum. **1**. 139 (1854); Presl, Bot. Bemerk. 121 (1844); Dur. et Schinz, Consp. **5**. 807 (1894); Henrard Crit. Rev. **3**. 487 (1928). *A. pygmaea* Trin. et Rupr. Spec. Gram. Stip. 133 (1842); Walp. Ann. Bot. **3**. 743 (1852); Steud. Syn. Pl. Glum. **1**. 138 (1854); Henrard Crit. Rev. **3**. 488 (1928). *A. strictiflora* Trin. et Rupr. Spec. Gram. Stip. 134 (1842); Walp. Ann. Bot. **3**. 743 (1852); Steud. Syn. Pl. Glum. **1**. 138 (1854); Henrard Crit. Rev. **3**. 600 (1928). *Chaetaria curvata* Nees, Fl. Afr. Austr. 186 (1841). *Chaetaria curvata* Nees β *minor* Nees, Fl. Afr. Austr. 187 (1841); Presl, Bot. Bemerk. 121 (1844). *Chaetaria mauritiana* (Kunth) Nees var. β *Nana* Nees, Fl. Afr. Austr. 188 (1841); Presl, Bot. Bemerk. 121 (1844).

A tufted *annual*, including the inflorescence up to 60 cm. high or even taller, at times very much smaller and dwarfed. *Culms* erect or somewhat geniculately ascending, more or less branched from the base and from the lower nodes, terete, striate, smooth, the upper nodes well-exserted. *Leaf-sheaths* more or less shorter than the internodes, tight, often slipping from the culms, compressed and keeled, smooth to scaberulous, striate, margins hyaline; *ligule* a ciliolate rim; auricles pubescent; collar glabrous; *blades* narrowly linear, tapering to a fine point, flat at the base or more usually folded throughout their length, up to 15 cm. long and 1–2 mm. wide, glabrous and striate on the lower surface, scabrous hirtellous on the upper surface, margins thickened. *Panicle* exserted, dense,

rather narrow, up to 20 cm. long, 1-2 cm. broad, more or less interrupted at the base, axis scabrous, terete below, angular upwards; branches scabrous, binate or branched almost from the base, the longer branches often peduncled, the shorter sessile; pedicels scabrous, fairly short. *Spikelets* yellowish, greenish or tinged with purple. *Glumes* unequal, linear-lanceolate to lanceolate-oblong; the lower 4-7 mm. long, emarginate and shortly mucronate at the apex, scabrous on the keel and strigose on the flanks, laterally compressed; the upper up to 8 mm. long, smooth on the keel below, scaberulous upwards, bifid and with a short apical mucro from the sinus. *Lemma* usually purple-mottled, compressed, punctulate all over, scabrous on the keel, at times scabrous on the flanks upwards, up to 10 mm. long; *callus* rounded, densely bearded, 0.5-0.75 mm. long; awns erect or spreading, scabrous, unequal; the central about 20 mm. long, the lateral about 15 mm. long.

SOUTH WEST AFRICA.

Otjinga, III. 1939, *Volk* 1396 a (D); Hollywood, II. 1939, *Volk* 1229 (D); Otjikongo, II. 1939, *Volk* 1294 (D); Asis, anno 1939, *Volk* 652 (D) et 653 (D) et 722 (D); Fockshof, anno 1939, *Volk* A. 157 (D); Ossa, III. 1939, *Volk* 1558 (D); Tsumeb, IV. 1934, *Dinter* 7444 a pro parte (G); Waterberg, V. 1928, *Bradfield* 377 (N); Spitzkopje, I. 1937, *Boss* TM. 36410 (T); Okahandja, II. 1903, *Dinter* s.n. (B, N); do., *Bertling* 14 (B); Otjimbingue, V. 1886, *Marloth* 1379 (B); Windhuk, *Bohr* 40 (B); do., III. 1910, *Mücke* 47 (N); between Mariental and Gibeon, III. 1913, *Engler* 6596 (B); Gründoorn, II. 1909, *Pearson* 3118 (K, T) et 3129 (A, BH, K, N, S) et 3160 (K); Sabiesis, II. 1909, *Pearson* 4118 (K); Kunab, IV. 1911, *Range* 1007 (B); Kuibis, V. 1909, *Range* 652 (B); Schakalskuppe, VII. 1913, *Range* 1771 (B); Sandverhaar, II. 1909, *Pearson* 4625 (BH, K) et 4674 (K, N); Akam River basin, II. 1909, *Pearson* 4745 (G, K); Chamis, IX. 1905, *Schultze* 418 (B); Seeheim, II. 1909, *Schäfer* 44 (B); Gawachab, II. 1909, *Pearson* 4332 (BM, N); Klein Karas, IV. 1931, *Oertendahl* 118 (B, K, N); Noachabeb, *Blank* 53 (B); Great Karasberg, I. 1913, *Pearson* 8493 (BH, BM, K, N, S); Ganus, II. 1909, *Pearson* 4490 (K, N); Kanuchas, IV. 1912, *Range* 1399 (B).

CAPE PROVINCE.

Little Namaqualand distr.: Between Natvoet and Orange River, *Drège* (B, BM, K, N, O, P, S); *Pella*, I. 1909, *Pearson* 3557 (K); Iaus, IX. 1897, *Schlechter* 11226 (A, B, N, W); Khamiesberg, XII. 1936, *Adamson* 1547 (N). Upington distr.: Upington, VIII. 1923, *Borchards* H. 21519 (N); Riemvastmaak, VII. 1925, *Barnard* 36147 (S); Louisvale, II. 1930, *Mennell* s.n. (W). Calvinia distr.: Springbokkuil, *Zeyher* 42 (B, S); between Losper's Plaats and Springbokkuil River, *Zeyher* 1817 (BM, G, K, V, Z). Ceres distr. Yuk Rivier, VII. 1811, *Burchell* 1266 (BM, K). Prince Albert distr.: Prince Albert, XII. 1904, *Bolus* 11670 (BH); Prince Albert Road, V. 1920, *Pillans* 21783 (BH). Victoria West distr.: Nobelsfontein, II. 1931, *Thorne* 49453 (S). Murraysburg distr.: Murraysburg, *Thorne* 10635 (A, T). Graaff-Reinet distr.: Graaff-Reinet, Sunday River, *Drège* (B, BM, G, K, N, O, P); Graaff-Reinet, III. 1868, *Bolus* 678 (A, BH, BM, K, V). Somerset East distr.: Somerset East, *McOwan* s.n. (S. 17873); Klein Visch Rivier, *McOwan* s.n. (S. 19379); Uitenhage distr.: Uitenhage, *Zeyher* 103.4 (A, G, K, V, Z); Steenbokvlakte north of Winterhoeksberg, *Ecklon et Zeyher* (B, N, S). Queenstown distr.: *Everett* 39 (N). Barkly East distr.: Barkly East, II. 1934, *Greyenstein* 8 (N). Albert distr.: Burghersdorp, *Cooper* 778 (D, K, Z); do., *Cooper* 1364 (BM, D, G, K, N, V, Z). Middelburg distr.: Middelburg, IV. 1922, *Gill* 44 (A, N, W); Rosmead Junction, III. 1911, *Pillans* 1804 (K). Philipstown distr.: Potfontein, III. 1933, *Schweickerdt* 1187 (N). Britstown distr.: Britstown, III. 1917, *Wilman* (B. 15149); 21 miles west of De Aar, X. 1928, *Pole Evans* 2230 (N). Prieska distr.: Prieska, IV. 1931, *Bryant* 606 (B, K, W); Spitzkop, III. 1920, *Bryant* K. 28 (N, W); Stofbakkies, III. 1934, *Wilman* 3131 (K, Mc). Herbert distr.: Campbell Kloof, II. 1937, *Wilman* s.n. (K); St. Clair, III. 1898, *Orpen* 254 (A, N); Honeynestkloof, III. 1920, *Wilman* s.n. (K); do., XI. 1929, *Phillips* 3469 (K, N) et 3468 (W). Kimberley distr.: Kimberley, II. 1913, *Wilman* 687 (Mc); do., VII. 1929, *Hitchcock* 24097 (K, W); Warrenton, IV. 1904, *Adams* 197 (T, V, Z); do., III. 1920, *Adams* s.n. (N). Mauritzfontein,

I. 1934, *Pocock* s.n. (U). Hay distr.: Wittewater, II. 1812, *Burchell* 2006 (G, K) et 2083 (A, B, K, P, V); Vaalwater, III. 1921, *Wilman* 1428 (K, Mc); Postmasburg, I. 1925, *Wilman* s.n. (U); near Griquatown, II. 1937, *Wilman* s.n. (K). Taungs distr.: Taungs, *Squire* H. 118 (N). Vryburg distr.: Vryburg, IV. 1912, *Sharpe* H. 7475 (N); do., III. 1920, *Theiler* H. 20239 (N); do., III. 1921, *Mogg* in Hb. Stell. 12541 (St). Without precise locality: *Carmichael* 51 (BM); *Burke et Zeyher* 1817 (O, P).

NATAL PROVINCE.

Estcourt distr.: Colenso, *Rehmann* 7182 (Z).

BASUTOLAND.

Leribe distr.: Leribe, *Dieterlen* 199 b (D, K, P pro parte, S); do., *Buchanan* 231 (S); Quthing distr.: Leloaleng, I. 1916, *Dieterlen* 1190 (N, P).

ORANGE FREE STATE.

Jacobsdal distr.: Jacobsdal, *Schweickerdt* 1151 (N). Fauresmith distr.: Fauresmith, XII. 1927, *Smith* 5178 (K) et I. 1928, *Smith* 5571 (K, N); Luckhoff, III. 1917, *Pole Evans* H. 11603 (N). Bloemfontein distr.: Bloemfontein, III. 1933, *Tidmarsh* 4931 (K) et 4933 (GU) et 4935 (GU). Senekal distr.: Senekal, XII. 1931, *Goossens* 942 (B, N). Kroonstad distr.: Kroonstad, II. 1928, *Pont* 9 (Z) et 58 (N, Z) et 60 (Z); do., III. 1931, *Guldenpfennig* 81 (N). Without precise locality: *Buchanan* 62 (D) et 66 (D) et 283 (BH, K) et 289 (D); *Rehmann* 3599 (Z).

TRANSVAAL PROVINCE.

Bloemhof distr.: Christiana, III. 1912, *Burt Davy* 14146 (N); do., I. 1934, *Theron* 563 (N). Potchefstroom distr.: Machavie, III. 1927, *Lane* 9 a (N) et 14 a (N). Johannesburg distr.: Johannesburg, IX. 1925, *Robinson* s.n. (N). Pretoria distr.: Pretoria, III. 1905, *Burt Davy* 185 (BH, K); do., III. 1929, *Skea* 63 (N); do., VI. 1912, *Theiler* 12022 (T); do., *Appleton* 42 (K). Rustenburg distr.: Rustenburg, II. 1933, *van Nouhuys* TM. 31894 (T). Marico distr.: Groot Marico, IV. 1927, *Liebenberg* S. 41 (N) et S. 45 (N). Waterberg distr.: Naboomspruit, III. 1923, *Galpin* M. 567 (N); Potgietersrust, IV. 1906, *Burt Davy* 2246 (N); do., III. 1921, *Galpin* 8892 (K, N). Pietersburg distr.: Pietersburg, IV. 1927, *Briggs* 10 (N); Duivelskloof, V. 1929, *Galpin* 11346 (N). Zoutpansberg distr.: Palmaryville, VI. 1930, *Koker* 10 (N); Messina, XII. 1917, *Moss et Rogers* 218 (Z). Barberton distr.: Barberton, V. 1930, *Thorncroft* 43 (N). Ermelo distr.: Nooitgedacht, I. 1927, *Henrici* 1473 (N).

BECHUANALAND PROTECTORATE.

Francistown, IV. 1929, *Gordon* 52 (N). Mochudi, V. 1914, *Harbor* s.n. (BH, D).

TYPE SPECIMEN.

Ecklon (et Zeyher) from Uitenhage is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Bruine-gras. Steekgras. Stickgrass.

ECONOMIC NOTES.

This species, while young, is excellent for feeding cattle and sheep. In the mature state it is no longer palatable. The mature florets are very troublesome in wool and the awns often penetrate the skins of animals. The florets furthermore cause lameness in animals by penetrating the regions between their claws.

45. **A. submucronata** *Schumach.* in *Sel. phys. og Mathem. Skr.* **3.** 67 (1827); *Henrard Crit. Rev.* **3.** 609 (1928); *Henrard Monogr.* **2.** 321 cum ic. tab. 157 (1932).

A. Thonningii *Trin. et Rupr. Spec. Gram. Stip.* 137 (1842); *Henrard Crit. Rev.* **3.** 632 (1928).

Annual, tufted. *Culms* erect, or somewhat geniculately ascending, branched from near the base and the lower nodes, including the panicle up to 75 cm. high; internodes terete, striate, exserted; nodes rather swollen, glabrous. *Leaf-sheaths* tight and terete, at length fairly lax, keeled and slipping from the culms, striate, smooth to slightly scaberulous, shorter than the internodes; *ligule* a ciliate rim; auricles ciliate; collar glabrous; *blades* narrowly linear, up to 40 cm. long and 1–2 mm. wide, flat or involute, scaberulous on both surfaces, margins thickened. *Panicle* erect, subspiciform, interrupted; branches fairly shortly peduncled and subsessile, especially the upper, fascicled; pedicels fairly short. *Spikelets* greenish suffused with purple, yellowish at maturity, erect, congested. *Glumes* unequal, linear-lanceolate; the lower scabrous along the keel and more or less so on the flanks, up to 6 mm. long, gradually tapering into the short awn; the upper somewhat scabrous along the keel, bilobed with a short awn from the sinus, up to 7 mm. long. *Lemma* compressed, exceeding the glumes, about 9 mm. long, purple-mottled, scabrid along the keel upwards, or even scabrous in the upper half, punctulate; *callus* rounded, densely bearded, about 0.5 mm. long; awns subequal to unequal, very scabrous, winged, up to 15 mm. long.

SOUTH WEST AFRICA.

Grootfontein, II. 1933, *Schoenfelder* 74 (K, N); Waterberg, IV. 1928, *Bradfield* 377 (N); Omane, II. 1939, *Volk* 1148 (D); Gross Otavi, IV. 1939, *Volk* 581 b (D); Runtu, V. 1939, *Volk* 1714 (D); Kwartel near Rehoboth, IV. 1911, *Dinter* 2169 (B).

ORANGE FREE STATE.

Mudrivierdrift, *Rehmann* 3599 (B).

TRANSVAAL PROVINCE.

Pretoria distr.: Onderstepoort, II. 1936, *Mogg* 13797 (N).

BECHUANALAND PROTECTORATE.

Francistown, V. 1929, *Francis* 109 (N); Selika near Palapye, IV. 1928, *Nobbs* 97 (U); Mochudi, I. 1914, *Rogers* 6575 (A, G, K, N, W, WR, Z); do., III. 1915, *Rogers* 6598 (G).

TYPE SPECIMEN.

The type "*Guin. Dr. Thon.* 356" is deposited in the Schumacher Herbarium, Copenhagen.

ECONOMIC NOTES.

This species is only eaten in the pre-flowering condition by bovines.

46. **A. adscensionis** *L. subsp. guineënsis* (*Trin. et Rupr.*) *Henrard Crit. Rev.* **1.** 216 (1926); *Henrard Monogr.* **2.** 325 cum ic. tab. 159 (1932).

A. adscensionis *Linn., sec. Obermeijer, Schweickerdt et Verdoorn in Bothalia* **3.** II. 227 (1937), non *Linn. A. guineënsis* *Trin. et Rupr. Spec. Gram. Stip.* 137 (1842); *Walp. Ann. Bot.* **3.** 744 (1852); *Steud. Syn. Pl. Glum.* **1.** 139 (1854).

Plants placed under this subspecies superficially greatly resemble slender specimens of *A. curvata* (Nees) *Trin. et Rupr.*, but may be distinguished from this species by the following characters: *Panicle* long and many-flowered, branches thin and spreading, naked at the base, the whole thus being lax and interrupted. The *glumes* and *lemmas* are usually shorter than those of typical *A. curvata* (Nees) *Trin. et Rupr.*

TRANSVAAL PROVINCE.

Kruger National Park : Hippopool on Sabi River, III. 1937, *Obermeijer* TM. 36088 (K, T). Waterberg distr. : Crecy, *Carver* 8 (N). Zoutpansberg distr. : Zoutpan, IV. 1934, *Schweickerdt et Verdoorn* 472 (N); Messina, III. 1929, *Staples* 858 (K, N); do., III. 1933, *du Plessis* s.n. (K, N).

TYPE SPECIMEN.

The type *Thonnig* s.n. is deposited in the Imperial Herbarium, Leningrad.

47. **A. barbicollis** *Trin. et Rupr.* Spec. Gram. Stip. 135 (1842); Walp. Ann. Bot. **3**. 746 (1852); Steud. Syn. Pl. Glum. **1**. 141 (1854); Dur. et Schinz, Consp. **5**. 800 (1894); Stapf in Dyer, Fl. Cap. **7**. 559 (1899); Medley-Wood, Natal Plants **5**. tab. 401 cum. descr. (1905); Stent in Bothalia **1**. IV. 278 (1924); Henrard Crit. Rev. **1**. 48 (1926); Henrard Monogr. **1**. 132 cum ic. tab. 50 (1929); Obermeijer, Schweickerdt et Verdoorn in Bothalia **3**. II. 227 (1937); Potts et Tidmarsh in Journ. S. Afr. Bot. **3**. III. 88 (1937).

A. barbicollis Trin. et Rupr. var. *conglomerata* Henr. Crit. Rev. Supplem. 705 (1933). *Chaetaria Forskohlii* Nees, Fl. Afr. Austr. 188 (1841), nor *A. Forskohlii* Tausch (1836).

Perennial, densely tufted, somewhat glaucous, with innovations usually present. *Culms* simple or branched from the lower nodes, several-noded, erect or geniculately ascending, slender, wiry, up to 60 cm. tall or somewhat taller; internodes distinctly compressed, glabrous or slightly scabrous; nodes glabrous exserted. *Leaf-sheaths* glabrous or somewhat scaberulous upwards, the lower strongly compressed and keeled, the upper less so, tight or at length slipping from the culms, shorter than the internodes; *ligule* a ciliolate rim; auricles glabrous or densely-long-bearded; collar bearded or glabrous; *blades* narrow linear, the apex rather obtuse, up to 20 cm. long but often much shorter, folded or convolute, curved or flexuous, the lower surface striate and glabrous, the upper scaberulous to hispidulous. *Panicle* composed of many peduncled spreading and divaricate false spikes, rather open, up to 15 cm. long and 5–10 cm. broad, variable in shape and size; axis erect, at length somewhat flexuous, angular, scaberulous; branches solitary or binate, distant, suberect or spreading, straight or flexuous, scaberulous, usually naked at the base for several centimetres; branchlets and pedicels congested to form false secondary spikes, scabrous. *Spikelets* usually brownish, often suffused with purple, congested. *Glumes* subhyaline, keeled, glabrous; the lower lanceolate, up to 6 mm. long, scaberulous on the keel and on the flanks near the apex, shortly awned; the upper linear, somewhat scaberulous on the keel and on the flanks upwards, shortly awned up to 8 mm. long. *Lemma* tubulous, glabrous below, distinctly scabrous upwards, including the callus and awns about 7–8 mm. long; *callus* 1 mm. long, densely bearded; *colum* of awns about 2.5 mm. long, twisted, scaberulous; awns subequal, spreading, fine, scaberulous, about 1.5–2 cm. long.

SOUTH WEST AFRICA.

Okahandja, V. 1928, *Bradfield* 277 a (N).

CAPE PROVINCE.

Prince Albert distr. : Weltevreden, *Drège* (K). Graaff-Reinet distr. : Sundays River, *Drège* [3879] (B, K, N, O, P, S); Graaff-Reinet, *Bolus* 677 (A, BH, D, K, V) et 679 (A, BM). Somerset East distr. : Somerset East, *McOwan* 1789 (BM, S) et 1657 (S). Uitenhage distr. : Between Koega and Sunday River, *Ecklon et Zeyher* 76 (N, S) et *Ecklon* s.n. (K); Enon, *Drège* 3881 (B, O); Albany distr. : Grahams-town, II. 1904, *Black* 23 (B, T); Botha's Hill, XII. 1894, *Schlechter* 6097 (A, B, BM, G, K); do., XII. 1926, *Britten* 5513 (A); do., V. 1928, *Dyer* 1439 (A, K, N); Carlisle Bridge, V. 1921, *Bowker* 6 (A); Peddie Road, IV. 1928, *Dyer* 1365 (A, K). Bathurst distr. : Kowie; *Hutton* 5 (A). Fort Beaufort distr. : Between Kunap and Kat Rivers, *Drège* 3881 (B), Adelaide, *Marloth* 3683 (B, N); Koonap Heights, IV. 1920, *Britten* 2041 (A). East London distr. : Nahoon Causeway, *Rattray* 1361 (N). Komgha distr. : Komgha, *Flanagan* 100,

(N) et 1010 (BH, S); Kei Bridge, III. 1909, *Rogers* 4513 (A). Kentani distr.: Kentani, III. 1909, *Pegler* 238 (BH). Queenstown distr.: Queenstown, *Everett* 49 (N); Shiloh, *Baur* 55 (N); Sterkstroom, II. 1917, *Burt Davy* 17059 (BH); Klaas Smits R. Bridge, III. 1928, *Galpin* 2355 (K, N). Xalanga distr.: Tsomo River, *Pegler* 1708 (BH). Wodehouse distr.: Sterkstroom, XI. 1901, *Sim* 2810 (A). Qumbu distr.: Tsitsa River, I. 1895, *Schlechter* 6374 (A, B, BH, BM, G, K, P, V). Colesberg distr.: Colesberg, *Drège* (K). Herbert distr.: Campbell, III. 1920, *Pole Evans* 11 (K). Prieska distr.: Prieska, III. 1931, *Bryant* 605 (K). Kimberley distr.: Kimberley, VII. 1929, *Hitchcock* 24099 (K, N, W); Rooipoort, III. 1923, *Wilman* 2222 (K, Mc); Kareeboom, III. 1921, *Wilman* 1425 (K, Mc, U); Du Toitspan, *Tuck* s.n. (K); near Vaalrivier, IV. 1886, *Schenck* 794 (N, Z). Kuruman distr.: III. 1931, *Lawson* 15031 (BH).

NATAL PROVINCE.

Umzinto distr.: Dumisa, I. 1915, *Rudatis* 2190 (St.) Ixopo distr.: Ixopo, III. 1935, *Otto* 1 a (N). Pietermaritzburg distr.: Pietermaritzburg, XI. 1930, *Goossens* 153 (N, W) et II. 1934, *Howes* 9 (K, W). Estcourt distr.: Winterton, I. 1933, *King* 386 (N); Colenso, II. 1891, *Medley Wood* 4418 (D, K); do., III. 1894, *Kuntze* s.n. (B). Helpmakaar distr.: Umsinga, *Buchanan* 90 (K). Bergville distr.: Acton Homes, I. 1920, *Doidge* H. 19837 (N) et H. 19839 (N). Zululand: XII. 1898, *Jenkinson* 40 (D, N). Without precise locality: *Gerrard et McKen* 167 (D); *Buchanan* 290 (B, D, K); *Medley Wood* 3588 (D, K).

BASUTOLAND.

Quthing distr.: Leloaleng, I. 1916, *Dieterlen* 1191 (N, P, S) et 1193 (N, P, S). Leribe distr.: Leribe, *Buchanan* 148 (BH).

ORANGE FREE STATE.

Fauresmith distr.: Fauresmith, I. 1928, *Smith* 5240 a (K) et 5503 (K) et 5572 (N). Bloemfontein distr.: Bloemfontein, II. 1934, *Tidmarsh* 4934 (GU) et II. 1915, *Potts* 1904 (T). Boshof distr.: Neth-el-Pella, IV. 1931, *Wolff* 11 (N). Hoopstad distr.: Hoopstad, II. 1933, *Goossens* 1277 (N); Great Vetrivier, *Burke* 210 (K, S) et *Burke et Zeyher* 1816 (O, P, V) et *Zeyher* 1816 (BM, S). Without precise locality: *Buchanan* 57 (D, K).

TRANSVAAL PROVINCE.

Bloemhof distr.: Christiana, III. 1912, *Burt Davy* 13031 et 13105 et 14102 et 14143 (omnes N) et II. 1904, *Burt Davy* 1609 (N). Potchefstroom distr.: Potchefstroom, XI. 1927, *Liebenberg* 1067 (N). Johannesburg distr.: Johannesburg, III. 1924, *Moss* 9840 (WR); do., VII. 1929, *Hitchcock* 24102 (K, N, W) et 24134 (K, W). Pretoria distr.: Pretoria, III. 1920, *Burt Davy* 18811 (K); do., *Smith* 81 (N) et 2288 (N); do., XI. 1934, *Liebenberg* 3210 (N); do., *Appleton* 22 (B, K); do., *Leendertz* 1095 (T); do., X. 1929, *Sandwith* 94 (K) et 95 (K); Premier Mine, II. 1924, *Rogers* 25323 (St); Hartebeestpoort, XI. 1925, *Moss* 12014 (K, WR); Baviaanspoort, IV. 1927, *Moss* 14161 (WR). Rustenburg distr.: I. 1909, *Collins* 6865 (T). Waterberg distr.: Warmbaths, I. 1936, *Irvine* 23 (N); Naboomspruit, II. 1919, *Galpin* M. 422 (N, W) Pongola River, XII. 1919, *Burt Davy* 18265 (K). Pietersburg distr.: Pietersburg, IV. 1927, *Briggs* 11 (N); do., II. 1904, *Bolus* 10901 (A, BH, K, N); Daviesville, II. 1932, *Markötter* in Hb. Stell. 16277 (St); Tzaneen, XI. 1913, *Rogers* 12511 (A, BH, K, N, W); The Downs, XI. 1917, *Moss et Rogers* 447 (K) et II. 1919, *Junod* 4078 (N, T); Modjadjes, XII. 1915, *Rogers* 18055 (BH). Zoutpansberg distr.: Mara, I. 1929, *Archer* 16 (N); Zoutpan, IV. 1934, *Schweickerdt et Verdoorn* 461 (N); Messina, X. 1929, *Turner* 20 (N); Pafuri River, *Nelson* 54 x (T). Lydenburg distr.: Lydenburg, XII. 1873, *Atherstone* s.n. (A); do., XII. 1893, *Schlechter* 3961 (A, B, BH, BM, G, K, P). Barberton distr.: Nelspruit, XII. 1930, *Liebenberg* 2733 (N); Barberton, I. 1931, *Mathews* 15 (N); Kaapmuiden, XII. 1921, *Rogers* 25083 (T). Swaziland: Black Umbuluzi, V. 1932, *Pole Evans* 3446 (B, K, N, W).

BECHUANALAND PROTECTORATE.

Gaberones, III. 1930, *Van Son* TM. 28609 (BM, N, T); do., IV. 1928, *Nobbs* 6 (U). Mochudi, III. 1914, *Rogers* 6578 pro parte (K). Mahalapye, IV. 1931, *Pole Evans* 3206 (N). Francistown, IV. 1929, *Gordon* 90 (N) et 105 (N).

PORTUGUESE EAST AFRICA.

Lourenco Marques, IX. 1919, *Shantz* 336 (K, W); do., XII. 1897, *Schlechter* 11569 (A, B, BH, N).

TYPE SPECIMEN.

Drège 3881 is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Duin-steekgras. Los-steekgras.

ECONOMIC NOTES.

This species is abundant in disturbed areas. In the young condition it is eaten by cattle and game, but in the more mature condition it forms indifferent grazing. On the whole it is not considered to be of much value as a fodder grass. It stands drought well. In the mature condition it is a pest to sheep farmers and thus is a troublesome weed. The natives use the culms for making brushes.

REMARKS.

This species in its typical form may readily be distinguished from *A. congesta* Roem. et Schult. by the open inflorescence. There are, however, very many intermediates which link up the two species, and such specimens can only be named arbitrarily. It is very probable that much natural hybridisation occurs among these species, since they frequently grow in association and also flower during the same period.

48. *A. alopecuroides* Hack. in Verh. Bot. Ver. Prov. Brandenb. 30. 114 (1888); Dur. et Schinz, Consp. 5. 800 (1894); Hack. in Bull. Herb. Boiss. 4. Append. III. 17 (1896); Garabedian in Ann. S. Afr. Mus. 16. II. 400 (1925); Henrard Crit. Rev. 1. 22 (1926); Henrard Monogr. 1. 121 cum ic. tab. 43 (1929).

Robust caespitose perennial. Culms erect, simple, up to 90 cm. high, 3-4-noded; internodes somewhat compressed, glabrous, smooth and striate; nodes exserted. Leaf-sheaths glabrous, smooth or slightly scaberulous, striate, compressed, tight; ligule a densely ciliolate rim; auricles pubescent or bearded; collar pubescent or bearded; blades linear, acuminate, up to 20 cm. long and 3 mm. wide, flat at the base, convolute upwards, glabrous and smooth beneath, scabrous and hirtellous on the upper surface. Panicle exserted, contracted, linear, elongate, spike-like, dense, up to 20 cm. long and 3 cm. broad, interrupted only at the very base; axis terete, scaberulous below; branches solitary, much-branched from near the base; branchlets and pedicels scabrous, short, fasciated, axils pubescent or glabrous. Spikelets erect, linear, scaberulous, congested. Glumes subequal; the lower very scabrous on the keel, including the 4 mm. long awn about 9-10 mm. long; the upper scabrous on the keel upwards, up to 12 mm. long including the 3 mm. long awn, apex bifid. Lemma about 6 mm. long, tubulous, narrowed into the column, granular and finally densely tubercled upwards; callus 1 mm. long, acute, densely hairy; column 4-6 mm. long, twisted, scabrous; awns subequal, 20-25 mm. long, scabrous, spreading.

SOUTH WEST AFRICA.

Olukonda, I. 1886, *Schinz* 656 (K, N, V, Z).

TYPE SPECIMEN.

Schinz 656 is deposited in the Naturhistorisches Museum, Vienna.

49. **A. Pilgeri** *Henrard Crit. Rev.* **2.** 443 (1927); *Henrard Monogr.* **1.** 123 cum ic. tab. 45 (1929).

Robust caespitose *perennial*. *Culms* erect, including the inflorescence up to 150 cm. high, simple, glabrous, glaucous, striate, terete, 3-6-noded; internodes exerted; nodes glabrous. *Leaf-sheaths* shorter than the internodes, usually pallid, margins finely ciliate; *ligule* minutely ciliate; auricles glabrous or bearded; collar glabrous or bearded with reflexed hairs; *blades* from a flat base, gradually acuminate, laxly convolute upwards, upper leaves involute, up to 35 cm. long, fairly rigid, glabrous on the lower surface, scabrous on the upper surface and along the margins, finely but not prominently nerved. *Panicle* dense, more or less contracted, at times subspicate, up to 40 cm. long and 5 cm. wide; axis terete or subangular, striate; branches solitary, up to 11 cm. long, erect or almost adpressed, much-branched from the base; branchlets adpressed. *Spikelets* densely imbricate, shortly pedicelled, pallid. *Glumes* somewhat unequal, awned; the lower 7.5-9 mm. long including the 1.5-2 mm. long awn, scaberulous in the upper half, keel and nerves scabrous, abruptly narrowed into the short awn; the upper 10-12 mm. long including the 2 mm. long awn, linear-lanceolate, keel smooth, bidentate at the apex. *Lemma* 6-7 mm. long including the column, linear or subfusiform, finely punctulate, finely scaberulous towards the apex; *callus* 0.75-1 mm. long, subobtuse, bearded; column of the awns about 1.5 mm. long, scaberulous, twisted; awns almost equal, somewhat spreading, scabrous, 10-20 mm. long.

SOUTH WEST AFRICA.

Omaheke, IV. 1911, *Seiner* 473 (B, W); Grootfontein, IV. 1916, *Hörnig* 165 (B, N); Otjiwarongo, III. 1928, *Bradfield* 278 (K, N); Okahandja, *Dinter* 1523 (B); Otjitjika, IV. 1913, *Dinter* 2938 (B, L, N); Eahero, III. 1913, *Dinter* 3281 (B); Namutoni-Tsinabis, VIII. 1919, *Pole Evans* 19380 (K, N); Asispforte, anno 1939, *Volk* A. 2 (D); Ossa, III. 1939, *Volk* 1831 (D); Neitsas, IV. 1939, *Volk* 380 (D); Blochfontein, V. 1939, *Volk* 1696 (D); Andara, V. 1939, *Volk* 2156 (D); Hollywood, II. 1939, *Volk* 1277 (D).

BECHUANALAND PROTECTORATE.

Raukaboom's Well, IV. 1931, *Pole Evans* 3309 (K, N).

TRANSVAAL PROVINCE.

Pretoria distr.: Aapies River Station, IV. 1939, *de Wit*, 794 (D).

NORTHERN RHODESIA.

Near Namwala, VII. 1932, *Trapnell* 1115 (K).

TYPE SPECIMEN.

Dinter 2938 is deposited in the Rijksherbarium, Leiden.

ECONOMIC NOTES.

Several collectors state this species to be of little or no value as a fodder plant as it is too tough and hard.

50. **A. longicauda** *Hack.* in *Boll. Soc. Brot.* **6.** 143 (1888); *Dur. et Schinz, Consp.* **5.** 804 (1894); *Henrard Crit. Rev.* **2.** 305 (1927); *Henrard Monogr.* **1.** 122 cum ic. tab. 44 (1929).

Perennial, caespitose, with several innovations. *Culms* erect, simple or somewhat branched from the upper nodes, up to 80 cm. high; internodes more or less terete or slightly compressed, glabrous and smooth; nodes glabrous, exerted. *Leaf-sheaths* shorter than the internodes, terete or somewhat keeled upwards, glabrous, striate; *ligule* a short ciliate rim; auricles long-bearded but hairs deciduous; collar bearded or glabrous; *blades* convolute, filiform, up to 30 cm. long and 2 mm. wide, glabrous and striate on the lower surface,

scaberulous on the upper surface. *Panicle* long-exserted, densely spike-like, contracted, up to 20 cm. long but often very much shorter, somewhat interrupted at the base; branches solitary, scaberulous, the lower naked at the base, the upper almost sessile, much-branched, adpressed; branchlets and pedicels short, scaberulous, densely fascicled. *Spikelets* congested, shortly pedicelled or subsessile, greenish or tinged with purple. *Glumes* unequal, shortly awned; the lower about 4.5 mm. long, scaberulous on the keel and on the flanks upwards, awn about 2 mm. long; the upper about 6 mm. long, keel glabrous, flanks very minutely strigose upwards, awn about 3 mm. long. *Lemma* tubulose, narrowed into the column, finely granular and somewhat scaberulous dorsally upwards, about 5-6 mm. long including the 1.5 mm. long densely bearded acute *callus*; column about 5 mm. long, twisted, scaberulous; awns fine, spreading, scaberulous, subequal, up to 2.5 cm. long.

TRANSCAVAL PROVINCE.

Barberton distr.: Komatipoort, XI. 1917, *Moss et Rogers* 608 (D, WR).

PORTUGUESE EAST AFRICA.

Lourenco Marques, X. 1919, *Shantz* 338 (K, W); do., IV. 1927, *Vaughan* s.n. (K); Mocambique, *Carvalho* 35 (N, V).

TYPE SPECIMEN.

Carvalho 35 is deposited in the Naturhistorisches Museum, Wien.

51. **A. congesta** *Roem. et Schult.*, Syst. Veg. 2. 401 (1817); *Kunth*, Enum. 1. 195 (1833); *Trin. et Rupr. Spec. Gram. Stip.* 153 (1842); *Walp. Ann. Bot.* 3. 746 (1852); *Steud. Syn. Pl. Glum.* 1. 142 (1854); *Dur. et Schinz, Consp.* 5. 802 (1894); *Hack. in Bull. Herb. Boiss.* 4. Append. III. 18 (1896); *Stapf in Dyer, Fl. Cap.* 7. 558 (1899); *Medley-Wood, Natal Plants* 5. tab. 484 cum descr. (1908); *Marloth, Fl. S. Afr.* 4. 21 tab. 6 fig. F 1-4 (1915); *Phillips in Ann. S. Afr. Mus.* 16. 347 (1917); *Dinter in Fedde, Rep.* 15. 341 (1918) pro parte; *Stent in Bothalia* 1. IV. 277 (1924); *Garabedian in Ann. S. Afr. Mus.* 16. II. 401 (1925); *Henrard Crit. Rev.* 1. 113 (1926); *Henrard Monogr.* 1. 126 cum ic. tab. 47 (1929); *Range in Fedde, Rep.* 33. 8 (1933); *Mogg in S.A. Journ. Science* 31. 394 (1934); *Potts et Tidmarsh in Journ. S. Afr. Bot.* 3. III. 88 (1937).

A. barbicollis *Trin. et Rupr. sec. Range in Fedde, Rep.* 33. 8 (1933), non *Trin. et Rupr. A. adscensionis* *L. sec. F. Bolus in Ann. S. Afr. Mus.* 9. IV. 231 (1915) pro parte, non *Linn. A. coarctata* *Licht. ex Roem. et Schult., Syst. Veg.* 2. 401 (1817) in syn., non *H. B. K.*; *Henrard Crit. Rev.* 3. 699 (1928). *A. congesta* *Roem. et Schult. var. genuina* *Chiov., Fl. Eritr.* 383 (1899); *Henrard Crit. Rev.* 1. 115 (1926). *A. Rangei* *Pilger in Engl. Bot. Jahrb.* 48. 344 (1912); *Dinter in Fedde, Rep.* 15. 342 (1918); *Garabedian in Ann. S. Afr. Mus.* 16. II. 404 (1925); *Henrard Crit. Rev.* 3. 498 (1928); *Henrard Monogr.* 1. 121 cum ic. tab. 44 (1929); *Range in Fedde, Rep.* 33. 9 (1933). *Chaetaria congesta* (*Roem. et Schult.*) *Nees, Fl. Afr. Austr.* 189 (1841).

Perennial, densely tufted, somewhat glaucous, with a few innovations nearly always present, at times a dwarf annual. *Culms* simple or branched from the lower nodes, wiry, slender, erect or somewhat geniculately ascending, several-noded, up to 75 cm. high, but frequently much smaller; internodes usually somewhat compressed especially below, glabrous, exserted; nodes glabrous. *Leaf-sheaths* compressed, striate, glabrous or slightly scaberulous towards the ligule, the lower pallid and strongly keeled, the upper at times somewhat keeled; *ligule* a ciliolate rim; auricles glabrous or densely long-bearded; collar glabrous or minutely pubescent; *blades* linear, terminating in a subobtuse tip, up to 20 cm. long, folded or convolute, usually somewhat curved or flexuous, glabrous and striate on the lower surface, scaberulous on the upper surface. *Panicle* dense, spike-like but frequently interrupted at the base by 1-several shortly peduncled spreading or adpressed false spikes, up to 15 cm. long, finally well-exserted; axis subterete to angular; branches short, almost sessile, scaberulous, branched from the base; pedicels scaberulous, angular, very short. *Spikelets* pallid or somewhat greenish-purple, densely congested. *Glumes* unequal, subhyaline; the lower lanceolate, scaberulous on the keel, often minutely so on the flanks

upwards, up to 8 mm. long, passing into the 1 mm. long scaberulous awn; the upper up to 10 mm. long, glabrous, scaberulous on the keel upwards, passing into the short awn. *Lemma* tubulous, up to 10 mm. long including the callus and the column, daintly scabrous upwards; *callus* 1 mm. long, densely bearded; column of awns up to 5 mm. long, twisted; awns somewhat unequal, spreading, fine, scabrous, up to 20 mm. long or somewhat longer.

SOUTH WEST AFRICA.

Otjiwarongo, I. 1939, *Volk* 472 (D); do., I. 1939, *Volk* 843 (D); Omane, II. 1939, *Volk* 1144 (D); Ossa, IV. 1939, *Volk* 1541 (D); between Tsumeb and Nosib, IV. 1934, *Dinter* 7444 A (B, G, N); Grootfontein, IV. 1913, *Engler* 6230 (K); Waterberg, V. 1928, *Bradfield* 277 b. (N); between Hoffnungsfelde and Harris, I. 1916, *Pearson* 9542 (BH, K, S); between Haris and Aub, I. 1916, *Pearson* 9669 (BH, S); Okahandja, III. 1928, *Bradfield* 277 (N, T); Klein Karas, V. 1931, *Oertendahl* 236 (B); do., IV. 1931, *Oertendahl* 116 (N); Kuibis, V. 1909, *Range* 647 (B, N); Aris, *Range* 1270 (K, N); Kubub, II. 1885, *Schinz* 657 (Z); Warmbad, IV. 1890, *Wandres* 19 (Z); without precise locality: *Grossarth* 42 (B) et *Blank* 39 (B).

CAPE PROVINCE.

Gordonia distr.: Upington, IX. 1919, *Shantz* 185 (W) et 182 (W); do., IV. 1928, *Pole Evans* 2173 (N). Kenhart distr.: Louisvale, II. 1930, *Mennell* s.n. (W). Little Namaqualand distr.: Springbokkuil, *Zeyher* 1818 (G, K, S, V); Dabeep, I. 1911, *Pearson* 6226 (K); Pella, I. 1909, *Pearson* 3590 (K). Fraserburg distr.: Williston, XI. 1921, *Foley* 187 (N). Cape distr.: Houtbay, VI. 1892, *Schlechter* 1015 (A, B, BH, V, Z). Prince Albert distr.: Fraserburg Road, I. 1903, *Marloth* 3054 (N). Uitenhage distr.: Steenbokvlakte, *Ecklon* (et *Zeyher*) s.n. (A, B, N, S); Uitenhage, IV. 1893, *Schlechter* 2458 (A, BH, BM, G, K, Z); Brakkloof, III. 1901, *White* 3 (A, B, V); Kariega, I. 1904, *White* 108 (A). Somerset East distr.: Somerset East, VIII. 1871, *McOwan* 1788 (A, BM, S); do., *Bowker* 134 (K) et 148 (K). Queenstown distr.: Shiloh, *Baur* 55 (K). Klaas Smit's Bridge, III. 1928, *Galpin* 2355 (A). East London distr.: East London, III. 1917, *Wood* TM. 23228 (T). Komgha distr.: Along Kei River, III. 1894, *Flanagan* 2317 (A, BH, K, N). Xalanga distr.: Cala, *Pegler* 1708 (K). Wodehouse distr.: Indwe, *Baur* 71 (K). Aliwal North distr.: Aliwal North, *Stephanie* 15080 (BH). Albert distr.: *Cooper* 778 pro parte (K, N). Cradock distr.: Cradock, IX. 1919, *Shantz* 151 (W). Graaff-Reinet distr.: Graaff-Reinet, XI. 1866, *Bolus* 550 (A); do., III. 1868, *Bolus* 679 (BH, D, K, V); do., III. 1930, *Galpin* 10588 (N). Middelburg distr.: Middelburg, IV. 1922, *Gill* 43 (A, N, W). Victoria West distr.: Nobelsfontein, II. 1931, *Thorne* SAM. 49454 (S). Colesberg distr.: Colesberg, *Drège* 4349 (B, BM, G, K, V); do., *Shaw* 16 (K, V). Philipstown distr.: Potfontein, III. 1933, *Schweickerdt* 1204 (N); Petrusville, II. 1934, *du Plessis* in Hb. Stell. 19713 (St). Britstown distr.: Giesen's Kraal, III. 1917, *Wilman* s.n. (BH). Prieska distr.: Between Modderfontein and Keikam's Poort, IX. 1811, *Burchell* 1612-5 (K); Prieska, III. 1931, *Bryant* 605 (B, K, W). Hay distr.: Between Griquatown and Wittewater, II. 1812, *Burchell* 1983 (K); between Kloof Village and Wittewater, *Burchell* 2084 (K); near Postmasburg, VI. 1929, *Uys* G. 18 (N). Herbert distr.: Douglas, III. 1898, *Orpen* 254 (K). Kimberley distr.: Modderriver, II. 1894, *Kuntze* s.n. (B, K); Kimberley, *Rehmann* 3472 (B) et 3475 (B); do., *Moran* BH. 13910 (BH); do., IV. 1914, *Wilman* 688 (Mc); do., VII. 1919, *Shantz* 198 (K, W). Barkly West distr.: Waldeck's Plant, V. 1936, *Cooke* 3533 (Mc); Madipelessa, II. 1937, *Acock* 1825 (B, K, L, V, Z). Vryburg distr.: Armoedsvlakte, *Theiler* H. 19218 (N) et H. 20195 (N); Vryburg, I. 1923, *Kaplan* TM. 26077 (T). Mafeking distr.: Mafeking, X. 1919, *Shantz* 233 (K, W) et 236 (K, W); do., IV. 1929, *Pole Evans* 3061 (N). Kuruman distr.: Kuruman, II. 1886, *Marloth* 996 (B, W); do., III. 1928, *Pole Evans* 2063 (B, BM, N); do., I. 1929, *Dedman* in Hb. Stell. 10054 (St). Without precise locality: *Lichtenstein* (B); *Shantz* 209 (K, W).

NATAL PROVINCE.

Estcourt distr.: Winterton, I. 1933, *King* 389 (N). Dundee distr.: VII. 1899, *Green* 39 (D). Without precise locality: *Buchanan* 124 (K).

BASUTOLAND.

Mafeteng distr. : Likhoele, XI. 1914, *Dieterlen* 1069 (N, P). Leribe distr. : Leribe, *Buchanan* 149 (K); do., *Dieterlen* 383 (B, D, K, N, P, W); do., *Phillips* 655 (S) et 898 (K, S); Maluti mountains, XII. 1937, *Staples* 142 (N).

ORANGE FREE STATE.

Fauresmith distr. : Fauresmith, V. 1927, *Smith* 3984 (K) et I. 1928, *Smith* 5241 (K). Edenburg distr. : Trompsburg, *Potts* 4539 (GU, N). Bloemfontein distr. : Besters, XII. 1911, *Burt Davy* 11789 (N); Bloemfontein, II. 1915, *Potts* 1904 (D, K); do., XII. 1933, *Tidmarsh* 4923-4925 (K); do., *Snoek* 4927 (GU) et 4928 (GU); Brandfort, XII. 1934, *Schonken* in Hb. Stell. 23305 (St). Boshof distr. : Beth-el-Pella, *Wolff* 10 (N). Winburg distr. : Steynskloof, II. 1928, *de Wet* 4570 (GU). Ficksburg distr. : Rivenhill Farm, I. 1927, *Potts* 3676 (N, GU) et 3724 (N, GU). Fouriesburg, *Dixon* 4591 (GU). Senekal distr. : Doornkop, XII. 1931, *Goossens* 870 (N, K, W) et 933 (N, K, W). Ferrara, XII. 1931, *Goossens* 1004 (K, N). Bethlehem distr. : Bethlehem, X. 1901, *Richardson* (K, W). Hoopstad distr. : Wesselsbron, I. 1933, *Goossens* 1249 (N). Kroonstad distr. : Kroonstad, XI. 1928, *Pont* 96 (N) et 97 (GU); do., XII. 1933, *Laubscher* 4926 (GU); Bothaville, I. 1933, *Goossens* 1174 (B, N) et 1178 (N); do., IV. 1931, *Boshoff* 2 (N); do., III. 1933, *Schweickerdt* 1088 (N). Vredefort distr. : Viljoensdrift, I. 1912, *Rogers* 4819 (T). Heilbron distr. : Heilbron, I. 1934, *Goossens* 425 (N). Without precise locality : *Buchanan* 58 (B) et 59 (B) et 276 (B); *Rehmann* 3668 (A, Z).

TRANSVAAL PROVINCE.

Bloemhof distr. : Christiana, II. 1904, *Burt Davy* 1654 (N); Kameelpan, I. 1934, *Theron* 549 (N); Fourteen Streams, II. 1904, *Burt Davy* 1577 (N). Wolmaransstad, XII. 1928, *Sutton* 69 (N). Lichtenburg distr. : Grasfontein, V. 1930, *Sutton* 425 (N). Potchefstroom distr. : Potchefstroom, II. 1927, *Lane* 15 (N, W) et 17 (N). Vereeniging distr. : Vereeniging, II. 1917, *Burt Davy* 17162 (BH, K). Standerton distr. : Standerton, III. 1918, *Stent* H. 21833 (N). Ermelo distr. : Ermelo, XII. 1926, *Henrici* 1361 (N, W); do., II. 1936, *Norval* 136 (N); Lake Chrissie, IV. 1910, *Hamilton* H. 5914 (N). Barberton distr. : Barberton, XII. 1916, *Pott* 5527 (T); do., I. 1931, *Matthews* 8 (N). Middelburg distr. : Middelburg, III. 1910, *Hewitt* s.n. (T). Johannesburg distr. : Johannesburg, V. 1919, *Bryant* D. 47 (N, W); do., XII. 1908, *Leendertz* 1837 (T); do., III. 1919, *Moss* 3810 (W, WR); do., I. 1915, *Edwards* s.n. (A, BH, K); do., III. 1937, *Lintner* 28130 (D, K); do., VII. 1929, *Hitchcock* 24102 (S). Germiston distr. : Germiston, I. 1913, *Fenn* H. 8703 (N). Pretoria distr. : Pretoria, *Nelson* 64 (K); do., III. 1920, *Skea* 68 (N); do., I. 1930, *Obermeijer* 29140 (T); do., I. 1926, *Smith* 2285 (N); Premier Mine, II. 1921, *Menzies* 6 (N); Elandsrivier, *Rehmann* 4999 (B, K); Pienaars River, I. 1894, *Schlechter* 4140 (A, B, BH, BM, G, K, N, P, T, V, Z). Rustenburg distr. : Rustenburg, III. 1910, *Burt Davy* 9302 (N). Waterberg distr. : Warmbaths, I. 1936, *Irvine* 19 (N) et 19 a (N); Twenty-four Rivers, I. 1916, *Rogers* 24908 (WR); Naboomspruit, II. 1919, *Galpin* M. 421 (N); Potgietersrust, I. 1909, *Leendertz* 1990 (T); Crecy, *Carver* 11 (N). Pietersburg distr. : Shilouvane, *Junod* 2155 (G). Zoutpansberg distr. : Zoutpansberg, V. 1905, *Junod* H. 4662 (N). Lydenburg distr. : Lydenburg, *Atherstone* s.n. (A, K, S); do., XII. 1893, *Schlechter* 3961 (BM, T); Zwagershoek, I. 1930, *Obermeijer* 377 (T).

BECHUANALAND PROTECTORATE.

Gaberones, IV. 1928, *Nobbs* 11 (U); Metsematluko, IV. 1928, *Nobbs* 34 (U); Mochudi, V. 1914, *Harbor* 21789 (BH).

PORTUGUESE EAST AFRICA.

Lourenco Marques, VII. 1922, *Moss* 6906 (WR).

TYPE SPECIMEN.

There are four sheets collected by *Lichtenstein* which are deposited in the Botanisches Museum, Berlin-Dahlem. The original labels on the sheets say "*Aristida coarctata*".

The specimens are overmature. There is another sheet in the Willdenow Herbarium, Berlin, which is an excellent match of Lichtenstein's gatherings. Although this sheet does not state the collector, it bears the name "*A. coarctata* Licht." and from its perfect match I do not hesitate to say that it is part of the original gathering. This sheet has been named up by Henrard as *A. congesta* Roem. et Schult.

The above-mentioned five sheets undoubtedly represent the type gathering, and the part of this in the Willd. Herbarium has actually been studied by Henrard.

COMMON NAMES.

Buffalo grass. Duin-steekgras. Klossaad. Rotstert-steekgras. Steekgras.

ECONOMIC NOTES.

This species is considered to be poor grazing, but quite a good hay if it is cut early. When mature it is a pest to the sheep farmer and is supposed to have no fodder value to speak of. It is, however, an important annual in overgrazed and tramped-out areas. In the wilted condition this species has been found to contain large amounts of prussic acid.

REMARKS.

Examination of Lichtenstein's gatherings and the type of *A. barbicollis* has revealed the fact that the auricles of the leaves are bearded. Owing to the overmature condition of the Lichtenstein specimens most of the hairs have disappeared, and it is only on some leaves that the beards are still present. Stapf in Dyer, Fl. Cap. 7. 552 (1899) has used the presence or absence of the bearded auricles as a key-character to distinguish between *A. barbicollis* and *A. congesta*. Although some specimens actually have glabrous auricles, this character does not appear to be coupled with the contracted inflorescence. I have seen several specimens with open panicles typical of *A. barbicollis* in which the auricles are perfectly glabrous. This distinguishing character must thus be discarded as it is of no taxonomic value. In my opinion the shape of the panicle, viz., contracted, or lax and open, appears to be the only character upon which the two species in question may be distinguished. There are, however, many intermediates which can only be named arbitrarily. Having furthermore examined a fair number of "dwarfed specimens" I have come to the conclusion that *A. Rangei* is most probably nothing else but a first year flowering condition of *A. congesta*. Field study and breeding experiments will probably support the opinion expressed above.

52. *A. spectabilis* Hack. in Bull. Herb. Boiss. 3. VIII. 380 (1895); Stapf in Dyer, Fl. Cap. 7. 562 (1899); Stent in Bothalia 1. IV. 278 (1924); Henrard Crit. Rev. 3. 577 (1928); Henrard Monogr. 1. 93 cum ic. tab. 25 (1929); Theron in Fedde, Rep. 40. 26 (1936).

Densely caespitose rather robust *perennial*. Culms erect, stout, up to 1.5 m. high, simple, terete, sheathed nearly all along. Sheaths exceeding the internodes, glabrous, smooth, often with a flake of wool at the mouth and from there somewhat woolly along the margins downwards, the upper inconspicuously striate; auricles of lowermost sheaths usually bearded, those of the uppermost sheaths usually glabrous. Leaf-blades linear, involute, firm, tapering to a setaceous apex, smooth on the lower surface, prominently nerved and minutely scaberulous on the upper surface, up to 60 cm. long, 4-5 mm. wide at the base, somewhat glaucous. Panicle oblong to ovate, lax and open, nodding, 30-40 cm. long, the axis smooth, with distant binate or solitary branches up to 20 cm. long, which in turn are again branched from near their base, the secondary, tertiary, etc., branchlets and pedicels minutely scaberulous, the latter as long as or much longer than the glumes. Spikelets glabrous, yellowish or greenish. Glumes linear-lanceolate, acute, rather firm, with hyaline erosely dentate tips and narrow margins, 1-nerved, smooth, subequal, about 10-12 mm. long. Lemma linear, about 6.5-7.5 mm. long inclusive of the callus, smooth or dorsally

minutely scaberulous upwards. *Callus* up to 1 mm. long, densely bearded, bifid. Column of awns strongly twisted, nearly glabrous, 5–6 mm. long; awns scaberulous, erect or spreading, unequal, the central up to 44 mm. long, the lateral awns up to 28 mm. long. *Anthers* 5 mm. long.

TRANSVAAL PROVINCE.

Potchefstroom distr. : Oudeplaats, IV. 1937, *Bunting* 156 (N) et 161 (N). Krugersdorp distr. : Hekpoort, III. 1937, *Bunting* 126 (N) et 145 (N). Pretoria distr. : Kuduspoort, *Rehmann* 4695 (B, V, Z) ; Saartjiesnek off Pelindaba Road, III. 1939, *Schweickerdt* 1333–1341 (B, K, N, W, V). Brits distr. : Jackson's Tuin, III. 1934, *Mogg* 14985 (N).

BECHUANALAND PROTECTORATE.

Kanye, III. 1937, *Bunting* 133 (N).

TYPE SPECIMEN.

Rehmann 4695 in the Botanisches Museum, Zürich, and the Naturhistorisches Museum, Wien are both in Hackel's own hand and thus together constitute the type.

ECONOMIC NOTES.

Owing to the very wiry nature of the culms and the stiff leaves, this species is unpalatable.

REMARKS.

The author of the present paper has repeatedly searched for this species at the type locality, Koedoespoort, near Silverton, but so far has not been successful in finding it in that locality. The species, however, is comparatively frequent but local in some parts of the Pretoria district and a wide series of specimens has recently been collected. The plants usually occur in large dense tussocks in sandy depressions on the northern slopes of the Magaliesberg. They are readily recognisable by their strictly erect habit and the half-nodding panicles which give them a very characteristic appearance. The plant may easily be confused with *A. diffusa* Trin. var. *Burkei*, but differs from this variety by having subequal glumes, the tips of which are hyaline.

53. *A. stipoides* Lam. *Encycl. Method.* 157 (1791) ; *Henrard Crit. Rev.* 3. 591 (1928) ; *Henrard Monogr.* 1. 93 cum ic. tab. 26 (1929).

A. stipoides Lam. var. *meridionalis* Stapf sec. Garabedian in *Ann. S. Afr. Mus.* 16. II. 405 (1925) pro parte, non Stapf. *A. gracillima* Oliv. in *Trans. Linn. Soc.* 29. 173 (1875) cum ic. 114 fig. 1 ; Dur. et Schinz, *Consp.* 5. 803 (1895) ; Hack. in *Bull. Herb. Boiss.* 4. *Append.* III. 18 (1896).

Robust *perennial*, loosely tufted. *Culms* simple or branched from the upper nodes, up to 100 cm. high ; internodes glabrous, slightly striate ; nodes glabrous, exserted. *Leaf-sheaths* shorter than the internodes, glabrous, striate ; *ligule* a short ciliate rim ; auricles woolly ; *blades* narrow, flat or involute, up to 20 cm. long, 3–4 mm. wide, smooth on the lower surface, striate and scaberulous on the upper surface. *Panicle* effuse, very lax and open, up to 30 cm. long, scantily flowered ; branches bi- or tri-nate, glabrous or scaberulous ; pedicels capillary, flexuous or curved or straight, scaberulous, with subclavate tips. *Glumes* pallid, or tinged with purple especially at the base, very unequal, glabrous ; the lower up to 7 mm. long, ovate-lanceolate ; the upper narrowly linear, 15–20 mm. long, mucronate from a bifid apex. *Lemma* terete, including the callus up to 9 mm. long, smooth but punctulate upwards ; *callus* slender, about 2 mm. long, bifid, densely hairy ; column of awns scabrous, twisted, 2.5–3 cm. long ; awns subequal, scabrous, up to 5.5 cm. long.

SOUTH WEST AFRICA.

Olukonda, II. 1886, *Schinz* 671 (Z) ; Onolongo, *Barnard* 42 (S) ; Mafa, *Barnard* 815 (S).

TYPE SPECIMEN.

The type is deposited in the Lamark Herbarium, Museum d'Histoire Naturelle, Paris.

54. *A. vestita* Thunb. Prodr. 19 (1794); Thunb. Fl. Cap. 1. 394 (1813); Thunb. Fl. Cap., ed. Schult. 104 (1823); Hack. in Engl. Bot. Jahrb. XI. 400 (1889); Dur. et Schinz, Consp. 5. 810 (1894) excl. syn. pro parte; Stapf in Dyer, Fl. Cap. 7. 561 (1899) pro parte et excl. syn. pro parte; F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915) pro parte; Phillips in Ann. S. Afr. Mus. 16. 347 (1917); Stent in Bothalia 1. IV. 278 (1924) pro parte; Henrard Crit. Rev. 3. 663 (1928); Henrard Monogr. 1. 94 cum ic. tab. 27 (1929). *A. vestita* Thunb. forma *amplior* Hack. in Engl. Bot. Jahrb. 11. 400 (1889); Henrard Crit. Rev. 3. 664 (1928). *A. diffusa* Trin. sec. Steud. Syn. Pl. Glum. 1. 142 (1854) pro parte, non Trin. *A. flocculmis* Mez in Fedde, Rep. 17. 147 (1921); Henrard Crit. Rev. 1. 182 (1926). *A. lanuginosa* Burchell, Travels 2. 226 (1824); Henrard Crit. Rev. 287 (1926). *Chaetaria vestita* (Thunb.) Beauv. Agrostogr. 30 et 152 et 158 (1812); Roem. et Schult. Syst. Veg. 2. 392 (1817).

Perennial, robust, densely caespitose, up to 85 cm. high, branched from the base only, often also from some of the culm-nodes. *Culms* about 3-4-noded, erect, rigid, not rarely somewhat wiry; internodes up to 25 cm. long, exserted, the lower densely (sometimes scantily) adpressedly woolly, the upper villous or at length becoming glabrous; nodes glabrous. *Lower leaf-sheaths* broad and papery, straw-coloured and somewhat brittle, adpressedly lanate dorsally and along the margins, eventually becoming glabrous, striate, shorter than the internodes; *ligule* a short ciliate rim, passing into a flake of wool at the auricles; *blades* linear, up to 24 cm. long and 3 mm. wide, either flat or more usually convolute, striate, lower surface glabrous, scabrous, shortly hairy on the upper surface, apex subpungent. *Panicle* pyramidal to subpyramidal, more or less effuse or laxly contracted, up to 20 cm. long and 12 cm. wide; axis striate, glabrous or with scattered white hairs, axillary beards present or absent; rachis of the inflorescence usually scabrous upwards; branches suberect or more usually spreading, scabrous; pedicels longer or shorter than the glumes, scabrous, subclavate at the tips. *Spikelets* pallid or light-brown owing to the colour of the glumes. *Glumes* glabrous, 1-nerved; the lower broadly lanceolate, 4.5 to 7 mm. long, rounded and ciliolate at the tip; the upper glume narrowly-lanceolate, slightly emarginate, 9-13 mm. long. *Lemma* glabrous, 7-11 mm. long from base of callus to articulation, usually mottled; *callus* up to 1.5 mm. long; column variable in length, 2-7 mm. long, strongly twisted; awns unequal, spreading, the central up to 35 mm. long, the lateral however much shorter.

SOUTH WEST AFRICA.

Schakalskuppe, II. 1909, *Pearson* 4801 (BH, K).

CAPE PROVINCE.

Gordonia distr.: Upington, IV. 1928, *Pole Evans* 2182 (N). Hay distr.: Griquatown, XII. 1811, *Burchell* 1917 (K); do., XII. 1811, *Burchell* 1842 (K, P); do., *Wilman* s.n. (K, Mc, N); Niekerk's Hope, X. 1936, *Lindeberg* 1331 (Mc); Kloof Village, Asbestos Mts.. II. 1812, *Burchell* 2038 (K); Rüdeseheim, IV. 1920, *Louw* 2670 (Mc). Kuruman distr.: Kuruman, III. 1928, *Pole Evans* 2097 (N); do., I. 1929, *Dedman* in Hb. Stell. 10049 (St). Barkly West distr.: Barkly West, IV. 1929, *Herram* 10 (N); Newlands, *Paton* 691 (Mc). Kimberley distr.: Warrenton, II. 1926, *Smith* 2347 (N); do., III. 1920, *Adams* 2671 (BH); Kimberley, I. 1886, *Marloth* 940 (B, W) et 847 (B, V, W). Mauritzfontein, I. 1934, *Pocock* s.n. (U); du Toits Pan, *Tuck* SAM. 19406 (S); Modderivier, II. 1894, *Kuntze* s.n. (B). Herbert distr.: Honeyestkloof, III. 1920, *Wilman* 2537 (K, Mc, U) et 1297 (K, Mc). Hopetown distr.: Hopetown, *Rehmann* 3294 (V). Hanover distr.: Hanover, I. 1902, *Galpin* 6260 (N). Prieska distr.: Prieska, *Bryant* 611 (B, K, W).

ORANGE FREE STATE.

Fauresmith distr.: Fauresmith, I. 1928, *Smith* 5242 (N). Bloemfontein distr.: Bloemfontein, *Tidmarsh* 4936-4939 (GU); Bestersput, *Welte* 183 (Z). Boshof distr.: Boshof, IV. 1931, *Wolff* 17 (N). Wepener distr.: Wepener, XII. 1934, *Schonken* in Hb. Stell. 23330 (St).

TRANSVAAL PROVINCE.

Bloemhof distr.: Bloemhof, *Burt Davy* 13030 (N); Kameelpan, I. 1934, *Theron* 599 (N).

WITHOUT PRECISE LOCALITY.

Burke et Zeyher 1810 (0).

TYPE SPECIMEN.

Thunberg's gathering is deposited in the Thunberg Herbarium, Upsala.

COMMON NAMES.

Beesgras. Bushmangrass. Hardegras. Teesuikergras.

ECONOMIC NOTES.

This species prefers shallow rocky soil where it is often abundant. It stands drought well but is of little value as a fodder.

REMARKS.

Buchanan 124 (BH, K) from Leribe, *Burt Davy* 9375 (N) from Ermelo, and *Atherstone* s.n. from near Lydenburg also belong to this species, but I very much doubt whether the localities indicated by these gatherings are correct.

Gatherings such as *Burchell* 1842 and *Wolff* 17 differ from typical *A. vestita* in that their culms are somewhat fasciated. This give them an appearance akin to species such as *A. Engleri* and *A. dasydesmis*. They may however be distinguished from the latter species by the adpressedly woolly internodes.

55. *A. meridionalis* *Henrard* Crit. Rev. 2. 344 (1927); *Henrard* Monogr. 1. 95 cum ic. tab. 27 (1929); *Obermeijer*, *Schweickerdt et Verdoorn* in *Bothalia* 3. II. 227 (1937).

A. stipoides Lam. sec. *Stent* in *Bothalia* 1. IV. 278 (1924), non Lam. *A. stipoides* Lam. var. *meridionalis* *Stapf* in *Dyer*, Fl. Cap. 7. 562 (1890); *Dinter* in *Fedde*, Rep. 15. 342 (1918); *Henrard* Crit. Rev. 3. 592 (1928).

Perennial, compactly caespitose. *Culms* erect, simple or somewhat branched, up to 2 m. high, 2-3-noded; internodes glabrous, striate, fairly thick in robust specimens: nodes usually dark in colour, glabrous, exserted. *Leaf-sheaths* striate; the lower usually densely woolly especially those of the innovations; the upper usually glabrous and smooth; *ligule* a short ciliolate rim; auricles with a dense flake of wool, long hairy; collar glabrous; *blades* narrow, usually involute, up to 50 cm. long and 5 mm. wide, striate and glabrous on the lower surface, scabrous on the upper surface. *Panicle* large, very lax and effuse, up to 50 cm. long and over 20 cm. wide, many-flowered; rachis smooth; branches 2-3-nate, repeatedly branched, smooth or scaberulous; pedicels capillary, flexuous, scaberulous, with sub-clavate tips, shorter to much longer than the glumes. *Glumes* unequal, glabrous; the lower 5-7 mm. long; the upper 10-15 mm. long. *Lemma* terete, 7-9 mm. long, mottled with purple, smooth or slightly punctulate, scaberulous upwards; *callus* 1.5-2 mm. long, slender, densely hairy, bifid; column of awns slender, twisted, up to 2 cm. long; awns subequal, up to 5 cm. long.

SOUTH WEST AFRICA.

Ondonga, IV. 1905, *Rautanen* 588 (Z) et 9 (K, V); *Tsumeb*, I. 1912, *Dinter* 2476 (L); Grootfontein, IV. 1913, *Engler* 6235 (K); Otjiwarongo, III. 1928, *Bradfield* 288 a (N) et V. 1928, *Bradfield* 288 (N); Awas mountains, I. 1916, *Pearson* 9661 (BH, K, S, W); Namutoni to Tsinabis, VIII. 1919, *Pole Evans* H. 19378 (N); Runtu, V. 1939, *Volk* 1716 (D); Nudsas, anno 1939, *Volk* A. 152 (D); Okos, III. 1939, *Volk* 970 (D); Small Waterberg, XII. 1939, *Volk* 565 (D); Asispforte, anno 1939, *Volk* A. 2 (D).

WITHOUT PRECISE LOCALITY.

Dinter 3271 (B); *Empire Exhibition* 28 (B, BH, BM, K, P, S, W, Z); *Seiner* 453 (W); *Nels* s.n. (Z); *Boss* TM. 36214 (T).

CAPE PROVINCE.

Hay distr. : Dunmurray, II. 1923, *Wilman* 2215 (Mc) et VII. 1923, *Coote* 2521 (Mc).
Herbert distr. : Honeyestkloof, *Rehmann* 3386 (BM, K, Z). Kimberley distr. : Kimberley, IX. 1919, *Shantz* 202 (W); Picardi, III. 1937, *Wilman* 4091 (Mc, K, N); Modderrivier, II. 1894, *Kuntze* s.n. (K). Barkly West distr. : Barkly West, II. 1921, *Wilman* 2142 (Mc).
Kuruman distr. : Kuruman, III. 1928, *Pole Evans* 2064 (K, N); do., I. 1929, *Dedman* in Hb. Stell. 10057 (St); between Kuruman and Matlareen River, VII. 1812, *Burchell* 2188 (K); near Dikgatlon, III. 1928, *Pole Evans* 2054 (N). Taungs distr. : Taungs, IX. 1917, *Pole Evans* H. 15834 (N). Vryburg distr. : Vryburg, V. 1912, *Burtt Davy* 13726 (N) et 14018 (N); Armoedsvlakte, IV. 1912, *Sharpe* H. 7445 (N); do., VIII. 1920, *Theiler* NH. 20244 (N); do., III. 1924, *Henrici* 92 (N); do., *Stent* H. 21505 (N) et IV. 1912, *Rogers* 21796 (BH). Mafeking distr. : Mafeking, IV. 1929, *Pole Evans* 2390 (N) et 2440 (K, N).

ORANGE FREE STATE.

Boshof distr. : Beth-el-Pella, IV. 1931, *Wolff* 25 (N). Bloemfontein distr. : Bloemfontein, V. 1909, *Potts* 5139 (N); do., *Pont* 1152 (Z) et 1153 (Z); between Kimberley and Bloemfontein, II. 1877, *Buchanan* 281 (BH, K, S).

WITHOUT PRECISE LOCALITY.

Buchanan 56 (K, D) et 68 (K, D).

TRANSVAAL PROVINCE.

Pretoria distr. : Pretoria, IX. 1930, *Goossens* 115 (N); do., III. 1929, *Skea* 54 (N); do., I. 1922, *Gower* 19 (N); Lichtenburg distr. : Enselberg Camp, V. 1928, *Pole Evans* 2212 (N); Waterberg distr. : Potgietersrust, III. 1921, *Galpin* 8890 (K, N, W); Zoutpansberg distr. : Zoutpan, IV. 1934, *Schweickerdt et Verdoorn* 604 (N).

BECHUANALAND PROTECTORATE.

Makarikari Lake, IV. 1931, *Pole Evans* 3275 (K, N); Nkate, IV. 1931, *Pole Evans* 3297 (N) et 3307 (N, K); between Kaotwe and Malopo, IV. 1928, *Nobbs* 73 (U); 30 miles south of Cwaiang Pan, VI. 1937, *Pole Evans* 4026 (N); between Naga Tatollo and Henry's Pan, *Holub* s.n. (K); Gaberones, III. 1930, *Van Son* TM. 28626 (N, T); do., IV. 1928, *Nobbs* 12 (U); Bakhatla Reserve, IV. 1931, *Pole Evans* 3157 (K, N).

TYPE SPECIMEN.

Dinter 2476 is deposited in the Rijksherbarium, Leiden.

COMMON NAMES.

Haygrass. Klossaad.

ECONOMIC NOTES.

This species is said to be used as a hay-grass during bad seasons. Owing to its coarseness it is not readily eaten by stock.

REMARKS.

Henrard in Crit. Rev. 1. 345 (1927) states that the species was described by Dr. Stapf as a variety of *Aristida stipoidea* in *Flora Capensis* Vol. 7. p. 562 . . .". Henrard, however, has selected *Dinter* 2476 in Herb. Leiden as the type and does not use the double citation for his species. It is therefore obvious that he has not based his species on Stapf's variety and that the use of the same epithet "*meridionalis*" does not indicate the raising of the variety to specific rank. It is a pity that Henrard did not select a different epithet to designate his species; it would have precluded any doubt as to whether he has based his species on Stapf's variety or not.

56. *A. dasydesmis* Mez in Fedde, Rep. 17. 148 (1921); Henrard Crit. Rev. 1. 131 (1926); Henrard Monogr. 1. 95 cum ic. tab. 26 (1929); Theron in Fedde, Rep. 40. 23 (1936).

A. angustata Stapf sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915), non Stapf. *A. vestita* Thunb. sec. Steud. Syn. Pl. Glum. 1. 142 (1854) pro parte; F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915) pro parte, non Thunb. *A. vestita* Thunb. var. *parviflora* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852); Stapf in Dyer, Fl. Cap. 7. 561 (1899); F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915); Henrard Crit. Rev. 3. 668 (1928). *Arthratherum vestitum* (Thunb.) Nees, Fl. Afr. Austr. 174 (1841); Drège, Zwei Pflanzengeogr. Doc. 90 (1843), non *Aristida vestita* Thunb.

Perennial, caespitose. *Culms* many-noded, erect, much-branched from the lower nodes, the fasciated branches culm-bearing, giving the whole plant a very characteristic appearance, glabrous. *Leaf-sheaths* glabrous, the lower soon deciduous, the upper at length slipping from the culms; *ligule* a ciliate rim; auricles minutely pubescent; *blades* more or less erect and stiff, smooth and subpungent, involute, about 1 mm. wide. *Panicle* somewhat contracted, at times fairly dense, up to 10 cm. long and 3 cm. wide; branches binate, the upper usually simple, adpressed to the rachis; branchlets and pedicels slightly scaberulous; the latter shorter than or as long as the glumes. *Glumes* unequal, glabrous; the lower about 5 mm. long, the upper up to 8 mm. long. *Lemma* tubulous, glabrous, including the callus up to 8 mm. long; *callus* 1 mm. long, bearded, truncate, obliquely truncate, rounded or slightly emarginate; column of awns twisted, about 5 mm. long; awns slightly unequal, the central up to 25 mm. long, the lateral up to 20 mm. long.

CAPE PROVINCE.

Little Namaqualand distr.: Iaus, IX. 1897, *Schlechter* 11228 (A, B, K, N); Ratel Poort, XII. 1909, *Pearson* 2952 (A, BM, K, N, S); Zilverfontein, *Drège* (B, BM, G, K, LG, N, O, P, S, V); Rietfontein, XII. 1908, *Pearson* 3768 (BH, K); Rietkloof mountain, II. 1910, *Pearson* 5719 (BH, K); Alewynsfontein, XII. 1908, *Pearson* 3487 (A, BH, BM, D, K, N, S); Kweekfontein, I. 1909, *Pearson* 3803 (A, BM, S). Aberdeen distr.: Camdeboosberg, *Drège* s.n. (LG). Gordonia distr.: Twinkoppies, III. 1937, *Acock* 2053 (K).

TYPE SPECIMEN.

Schlechter 11228 is deposited in the Botanisches Museum, Berlin-Dahlem.

REMARKS.

The articulation at the apex of the lemma is not always well-developed, in fact *Pearson* 3487 shows the presence of lemmas which are very inconspicuously articulated. As the specimens constituting this gathering are over-mature, the normally developed lemmas have probably already been shed and only the imperfectly developed lemmas have not yet disarticulated.

57. *A. Engleri* Mez in Fedde, Rep. 17. 147 (1921); Garabedian in Ann. S. Afr. Mus. 16. II. 402 (1925); Henrard Crit. Rev. 1. 170 (1926); Henrard Monogr. 1. 96 cum ic. tab. 29 (1929); Range in Fedde, Rep. 33. 8 (1933).

Aristida stipoides Lam. var. *meridionalis* Stapf sec. Garabedian in Ann. S. Afr. Mus. 16. II. 405 (1925) pro parte, non Stapf. *Aristida vestita* Thunb. sec. F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915) pro parte; Garabedian in Ann. S. Afr. Mus. 16. II. 406 (1925); Range in Fedde, Rep. 33. 10 (1933); omnes non Thunb.

The facies of this species so closely resembles that of *A. dasydesmis* Mez that unless the spikelets are dissected these two species are not to be distinguished with any degree of certainty. *A. Engleri* has a lemma which is dorsally distinctly scaberulous, furthermore the callus is distinctly bifid whereas in *A. dasydesmis* the callus is truncate or slightly emarginate and the lemma is dorsally glabrous.

SOUTH WEST AFRICA.

Gründoorn, II. 1909, *Pearson* 4554 (A, BH, BM, D, K, N, S); Bethanie, IV. 1911, Range 1013 (B); Aus, III. 1929, *Dinter* 6128 (B, BH, K); do., X. 1922, *Dinter* 4161 (Z);

Kuibis, *Engler* 6717 (B); do., *Range* 891 (871?) (B); Akam River, II. 1909, *Pearson* 4765 (BH, BM, K, S); Sandverhaar, II. 1909, *Pearson* 4612 (A, D, K); Kleine Karasberge, V. 1931, *Oertendahl* 232 (B); Great Karasberg, I. 1913, *Pearson* 8495 (BH, BM, K, S); Naruda Süd, I. 1913, *Pearson* 8307 (A, BM, D, N, S); Noachabeb, *Blank* 38 (B); Kraaikluft, VI. 1931, *Oertendahl* 483 (B); Lord Hills, I. 1913, *Pearson* 8494 (A, BH, K, N); Dabaigabis, I. 1909, *Pearson* 4406 (BH, BM, K, S); Raman's Drift, I. 1909, *Pearson* 4533 (K).

CAPE PROVINCE.

Little Namaqualand distr.: Copperberg, X. 1926, *Pillans* 5648 (BH, K); Alewynsfontein, XII. 1908, *Pearson* 3487 (N). Hay distr.: Postmasburg, III. 1920, *Pole Evans* 72 (K); Dunmurray, III. 1920, *Pole Evans* 80 (K, N); do., II. 1923, *Wilman* 2216 (BH, K, Mc, N). Without precise locality, *Drège* s.n. (LG, O, P).

TYPE SPECIMEN.

Engler 6717 is deposited in the Botanisches Museum, Berlin-Dahlem.

ECONOMIC NOTES.

This species mainly grows in mountain gorges. It is eaten by horses and cattle. Considered a good fodder-grass.

58. *A. diffusa* Trin. var. *genuina* Henrard Monogr. 1. 97 (1929).

A. diffusa Trin. var. *densa* (Trin. et Rupr.) Henrard Crit. Rev. 3. 665 (1928); Henrard Monogr. 1. 97 (1929). *A. diffusa* Trin. var. *Eckloniana* (Trin. et Rupr.) Henrard Crit. Rev. 3. 666 (1928). Henrard Monogr. 1. 97 cum ic. tab. 29 (1929). *A. diffusa* Trin. var. *Schraderiana* (Trin. et Rupr.) Henrard Crit. Rev. 3. 668 (1928); Henrard Monogr. 1. 97 (1929). *A. Hystrix* Thunb. Prodr. 19 (1794), non Linn. fil. (1781); Henrard Crit. Rev. 2. 252 (1927). *A. vestita* Thunb. sec. Steud. Syn. Pl. Glum. 1. 142 (1854); F. Bolus in Ann. S. Afr. Mus. 9. IV. 232 (1915); sec. Stanpf in Dyer, Fl. Cap. 7. 561 (1899) omnes pro parte, non Thunb. *A. vestita* Thunb. var. *densa* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852); Henrard Crit. Rev. 3. 666 (1928). *A. vestita* Thunb. a *diffusa* (Trin.) Walp. Ann. Bot. 3. 747 (1852). *A. vestita* Thunb. var. *Eckloniana* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852); Dur. et Schinz, Cons. 5. 810 (1894). *A. vestita* Thunb. var. *Schraderiana* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852); Stapf in Dyer, Fl. Cap. 7. 561 (1899). *Chaetaria Hystrix* P. de Beauv. sec. Roem. et Schult. Syst. Veg. 2. 390 (1817) pro parte. *A. diffusa* Trin. Tain. Gran. Gen. in Mem. Acad. Imp. Sc. Petrop. Ser. 6. 1. 86 (1830); Kunth, Enum. 1. 193 (1833); Steud. Syn. Pl. Glum. 1. 142 (1854) pro parte. Henrard Crit. Rev. 1. 142 (1926); Henrard Monogr. 1. 96 cum ic. tab. 28 (1929).

Perennial, densely caespitose. *Culms* simple, erect, 1-2-noded, up to 75 cm. high, firm, glabrous and smooth; internodes terete; nodes exserted. *Leaf-sheaths* tight, glabrous or the lower covered with a fugacious woolly indumentum; *ligule* a ciliate rim; auricles pubescent; *blades* convolute, up to 30 cm. long, 2-5 mm. wide, curved or flexuous, lower surface smooth, upper surface scaberulous or hispidulous. *Panicle* effuse, up to 15 cm. long and nearly as broad; rhachis straight or somewhat flexuous; branches at length spreading. *Spikelets* suberect or nodding, purple, purplish-brown or brown. *Glumes* unequal, glabrous; the lower obtuse, 4-10 mm. long; the upper up to 18 mm. long. *Lemma* including the callus up to 14 mm. long, almost smooth but usually dorsally scaberulous upwards; *callus* about 1 mm. long, distinctly bifid, densely bearded; *column* about 6 mm. long, twisted, scabrous; *awns* scaberulous, subequal, the central up to 35 mm. long, the lateral up to 30 mm. long.

CAPE PROVINCE.

Clanwilliam distr.: Het Kruis, IX. 1912, *Glover et Stephens* 14722 (BH); Boschkloof, *Drège* (891) (B, K, LG, N). Piquetberg distr.: Above Piekens Pass, XI. 1910, *Pillans* 5185 (K); Moutons Valley, XI. 1934, *Pillans* 7356 (BH). Malmesbury distr.: Hopefield, XI. 1885, *Bachmann* 871 (B, V, Z) et 872 (B, Z) et 677 (B). Ceres distr.: Elandskloof, XII. 1935, *Levyns* 5098 (U). Paarl distr.: Bains Kloof, XI. 1896, *Schlechter* 9138 (A, B, BH, BM, G, K, N, P, V, W, Z). Stellenbosch distr.: Stellenbosch, XII. 1915, *Bolus* 14921

(BH, D, K, T); do., XII. 1916, *Duthie* 88 (A, K, Sreg); Firgrove, X. 1929, *Sandwith* 154 (K). Cape distr.: Table Mountain, *Ecklon* 976 (B, G, K, N, O); Cape Town, *Harvey* 158 (K); do., *Prior* s.n. (K, S); do., VII. 1928, *Hitchcock* 24088 (K, N, W). Caledon distr.: Caledon, *de Villiers* 16 (N). Swellendam distr.: Between Breede Rivier and Zonder Einde Rivier, *Burchell* 7491 (K). Riversdale distr.: Riversdale, XI. 1892, *Schlechter* 1764 (A, B, G, K, Z); Oakdale, II. 1929, *Levy's* 2714 (U) et 2873 (U). Prince Albert distr.: Tygerberg, V. 1907, *Marloth* 4452 b (N). Laingsburg distr.: Whitehill, XI. 1924, *Compton* 2928 (BH). Uitenhage distr.: Above Koega River, *Zeyher* 4505 (S). Zwartkopsriver, *Zeyher* 4504 (N, K, P, V); do., *Zeyher* 447 (A); between Koega and Sunday Rivers, *Drège* (B, N).

WITHOUT PRECISE LOCALITY.

Krauss s.n. (B); *Pickstone* 51 (B); *Bergius* 236 (B); *Boivin* (B). *Thunberg* (BM, LG); *Masson* (BM, G, P); *Carmichael* (BM); *Pappe* 9722 (BM); *Zeyher* 4405 (K).

TYPE SPECIMEN.

The type is deposited in the Trinius Herbarium, Leningrad. The sheet does not bear a collector's name or a number, but merely "*C. B. Sp., Thunberg mis. absq. nom.*" Trinius first named the sheet *A. diffusa* but later ? substituted the epithet "*vestita*".

58a. **A. diffusa Trin. var. Burkei (Stapf) Schweickerdt** in Notizbl. Bot. Garten u. Mus. Berlin-Dahlem 14. 122 p. 195 (1938).

A. Burkei Stapf in Dyer, Fl. Cap. 7. 557 (1899); Phillips in Ann. S. Afr. Mus. 16. 347 (1917) pro parte; Stent in Bothalia 1. IV. 277 (1924); Henrard Crit. Rev. 1. 64 (1926); Henrard Monogr. 2. 183 cum ic. tab. 81 (1932); Theron in Fedde, Rep. 40. 20 (1936); Potts et Tidmarsh in Journ. S. Afr. Bot. 3. II. 88 (1937). *A. vestita* Thunb. sec. Stapf in Dyer, Fl. Cap. 7. 561 (1899) pro parte; Medley Wood, Natal Plants 5. tab. 402 cum descr. (1905); Stent in Bothalia 1. IV. 278 (1924) pro parte, omnes non Thunb. *A. angustata* Stapf sec. Medley Wood, Natal Plants 2. tab. 198 cum descr. (1904), non Stapf.

Perennial, densely caespitose. *Culms* slender, erect, wiry, smooth, up to 75 cm. high, usually 3-more-noded; internodes, terete, glabrous; nodes glabrous. *Leaf-sheaths* firm and tight, glabrous, usually shorter than the internodes; *ligule* a line of short hairs; auricles and collar glabrous; *blades* setaceously convolute, curved or flexuous, up to 30 cm. long or longer, about 3 mm. wide near the base, lower surface striate and glabrous, upper surface scaberulous. *Panicle* up to 30 cm. long or more, diffuse and open, at times scantily developed and much smaller; rachis striate, smooth; branches 2-3-nate, up to 15 cm. long or longer, filiform, branched, smooth or scaberulous; branchlets capillary, flexuous; pedicels as long as or longer than the spikelets. *Spikelets* yellow-brown to pallid, nodding. *Glumes* unequal, glabrous; the lower up to 6 mm. long; the upper about 12 mm. long. *Lemma* about 12 mm. long, smooth and glabrous, at times dorsally scaberulous upwards; *callus* bifid, bearded, about 1.0 mm. long; column 2-5 mm. long, twisted; awns somewhat unequal; the central up to 25 mm. long, the lateral up to 20 mm. long.

CAPE PROVINCE.

Ladismith distr.: Ladismith, VII. 1929, *Levy's* 4199 (U). Prince Albert distr.: Prince Albert, XII. 1904, *Bolus* 11671 (BH, D, N); Fraserburg Road, I. 1923, *Marloth* 3058 (N); Zwartbulletje, *Drège* (K). Aberdeen Distr.: Aberdeen Road, IX. 1929, *Pole Evans* 2545 (N). Somerset East distr.: Somerset East, *McOwan* 1658 (A, U); Blyde River, V. 1813, *Burchell* 2978 (G, K). Albany distr.: Carlisle Bridge, V. 1921, *Bowker* 16 (A). Komgha distr.: Komgha, III. 1893, *Flanagan* 1780 (BH, N, S). Graaff-Reinet distr.: Graaff-Reinet, IV. 1866, *Bolus* 459 (A, BH, K). Cradock distr.: Mortimer, I. 1902, *Kensit* 21794 (BH). Middelburg distr.: Middelburg, IV. 1922, *Gill* 41 (A, N); do., *Selschop* H. 15163 (N); do., IV. 1911, *Pillans* 1846 (K); Middelburg Road Station, *Flanagan* 1644 (BH, N); Rosmead Junction, III. 1911, *Pillans* 1805 (K). Queenstown distr.: Queenstown, *Everett* 50 (N); Shiloh, *Baur* 964 (K); Fincham's Nek, IV. 1898, *Galpin* 2383 (A, K,

N, W). Wodehouse distr. : Indwe, XI. 1901, *Sim* 2758 (A). Albert distr. : Burghersdorp, *Cooper* 3372 (K). Aliwal North distr. : Aliwal North, *Sister Stephanie* 289 (A, BH) ; do., anno 1934, *Truter* 7 et 47 et 64 (omnes St). Barkly East distr. : Barkly East, II. 1934, *Greyvenstein* 13 (N). Colesberg distr. : Achteertang Station, V. 1930, *Bennett* 21401 (N). Aliwal North distr. : Eland's Hoek, I. 1904, *Bolus* 10506 (BH, N). Barkly West distr. : Barkly West, XII. 1893, *Bennie* 588 (A). Mafeking distr. : Bultfontein, IV. 1929, *Pole Evans* 2452 (N).

WITHOUT PRECISE LOCALITY.

Burke et Zeyher 1808 (O) ; *Zeyher* 1811 (K). Matatiele distr. : Matatiele, III. 1914, *Jacottet* 806 (Z).

NATAL PROVINCE.

Klip River distr. : Ladysmith, *Medley Wood* 9100 (D). Dundee distr. : near Dundee, III. 1899, *Medley Wood* 7449 (D) et 7450 (D, K). Zululand, II. 1899, *Jenkinson* 79 (BH, D, K). Coldstream, Drakensberg, *Rehmann* 6929 (V, Z).

BASUTOLAND.

Leribe distr. : Leribe, *Dieterlen* 199 a (B, D, K, N, P, S, Z) ; do., II. 1913, *Phillips* 948 (S). Maluti Mountains, *Staples* 29 et 131 (N). Cana, III. 1905, *Moreillon* 10 (Z).

WITHOUT PRECISE LOCALITY.

Dieterlen 199 (K, V).

ORANGE FREE STATE.

Fauresmith distr. : Fauresmith, V. 1927, *Smith* 3967 (K) et 4014 (K) ; do., VI. 1927, *Smith* 4168 (K) ; do., I. 1925, *Pole Evans* 1573 (N). Edenburg distr. : Trompsburg, I. 1925, *Potts* 4533 (GU, N). Bloemfontein distr. : Bloemfontein, II. 1929, *Tidmarsh* 4561 (GU) ; do., III. 1933, *Koller* 4922 (GU) ; do., *Kuntze* s.n. (K) ; do., *Potts* 2395 (B, K) et 2442 (B, K) ; Glen, III. 1926, *Weger* 3727 (K). Serelal distr. : Wonderkop, XII. 1931, *Goossens* 849 (K, N) ; Doornkop, XII. 1931, *Goossens* 888 (K, N, W) ; Ferrara, XII. 1931, *Goossens* 958 (K, N, W). Bethlehem distr. : Bethlehem II. 1919, *Potts* 4519 (K, N) ; do., X. 1901, *Richardson* s.n. (B, P, V, W). Heilbron distr. : Heilbron, I. 1931, *Goossens* 418 (N) et 547 (N). Kroonstad distr. : Kroonstad, *Pont* 4 (N) et 99 (GU) et 100 (Z). Hoopstad distr. : Near Hoopstad, *Grindon* s.n. (K, N). Near the Vaalrivier : *Burke* 165 (BM, K, N, S).

TRANSVAAL PROVINCE.

Potchefstroom distr. : Klerksdorp, I. 1910, *Weeber* H. 5648 (N). Vereeniging distr. : Vereeniging, II. 1917, *Burt Davy* 17163 (B, N) ; do., III. 1917, *Burt Davy* 17496 (K, W) ; do., XII. 1914, *Burt Davy* 15091 (BH) ; do., IV. 1936, *Story* 57 (N). Heidelberg distr. : Henley-on-Klip, II. 1922, *Stent* H. 21585 (N) et IV. 1925, *Stent* H. 21788 (N) ; Uitgevallen, XII. 1909, *Burt Davy* 9161 (N). Wakkerstroom distr. : Amersfoort, III. 1917, *Burt Davy* 17363 (K). Volksrust, V. 1920, *Mogg* 7526 (N). Ermelo distr. : Nooitgedacht, I. 1917, *Henrici* 1524 (N, W). Johannesburg distr. : Johannesburg, II. 1925, *Moss* 16255 (W, WR) ; do., III. 1927, *Moss* 16964 (K) ; do., II. 1928, *Blenkiron* 765 (K) et 1084 (K) ; Witpoortje, I. 1898, *Conrath* 879 (V, Z). Pretoria distr. : Pretoria, II. 1929, *Mogg* 16143 (N) ; do., III. 1905, *Burt Davy* 4514 (N) ; do., *Nelson* 5 (K) ; Saltpan, II. 1929, *Leemann* TM. 27302 (T) ; Hamanskraal, I. 1894, *Schlechter* 4197 (A, B, BM, G, K, V, W) ; Between Elandsrivier and Klippan, *Rehmann* 5124 (B, BM, K, Z). Waterberg distr. : Makapanspoort, I. 1894, *Schlechter* 4324 (A, B, BM, G, K, T, V) ; Potgietersrust, *Nelson* 55 (K) ; Pietersburg distr. : Sand Rivier, II. 1895, *Schlechter* 6908 (B, BM, G, K, V, Z).

TYPE SPECIMEN.

Burke 165 is deposited in The Herbarium, Royal Botanic Gardens, Kew.

COMMON NAMES.

Besemgras. Koperdraadgras. Steekgras. Teesuikergras.

ECONOMIC NOTES.

Opinion differs as to the value of this species. It is said in one case that cattle relish this species, whereas in other cases it is said to be particularly unpalatable even in the young condition. It is supposed to be one of the least palatable grasses in the mountain area. The fruits penetrate the skins of animals and so are injurious to stock.

REMARKS.

Careful examination of the type (Kew) and isotypes (British Museum, South Afr. Museum) has shown that the lemmas of many spikelets are more or less articulated. This articulation may at times be rudimentary or even absent in many spikelets, but its position and nature is similar to that typical of the well-defined § *Arthratherum*. The degree of development of the articulation in any particular specimen appears to be more or less correlated with the age of that specimen. The presence of a distinctly bifid callus and the very unequal glumes are furthermore important characters in support of my view that *A. Burkei* Stapf has been placed incorrectly by earlier authors in the § *Chaetaria*. The species must moreover be removed from that section to find its natural position in § *Arthratherum*. Because of its close affinity to *A. diffusa* Trin. I have placed it as a variety under that species.

Theron in Fedde, Rep. 14. 7 (1936) places *A. Burkei* in the same category as *A. Marlothii* Hack. and *A. Dregeana* (Nees) Trin. et Rupr. The two last-named species are typical representatives of the § *Stipagrostis*, and members belonging to this section form a morphologically well-defined group. In my opinion it is taxonomically impossible to class together a typical representative of the § *Arthratherum* with members of the § *Stipagrostis*. For this reason I am unable to accept Theron's suggested classification. It may however be possible to subdivide the existing organographic sections more satisfactorily on basis of a combined consideration of the organographic and anatomical characters. Such an investigation (to which cytological investigation could be coupled) would certainly yield interesting results. This work however lies wholly beyond the scope of the present paper.

58b. *A. diffusa* Trin. var. **Pseudo-Hystrix** (Trin. et Rupr.) Henrard Crit. Rev. 3. 471 (1928); Henrard Monogr. 1. 97 (1929).

A. diffusa Trin. var. *brevestipitata* (Trin. et Rupr.) Henrard Crit. Rev. 3. 665 (1928); Henrard Monogr. 1. 97 (1929). *A. pseudohystrix* (Trin. et Rupr.) Steud. Syn. Pl. Glum. 1. 142 (1854). *A. vestita* Thunb. sec. Steud. Syn. Pl. Glum. 1. 142 (1854) pro parte, non Thunb. *A. vestita* Thunb. var. *brevestipitata* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852). *A. vestita* Thunb. var. *Pseudo-Hystrix* Trin. et Rupr. Spec. Gram. Stip. 158 (1842); Walp. Ann. Bot. 3. 747 (1852); Dur. et Schinz, Consp. 5. 810 (1894).

The facies of this variety closely resembles that of the species but differs from it by the very short column of the awns. The length of the column is somewhat variable, it may be almost completely absent or reach a length of up to 4 mm. This variation at first led the author of this paper to place one and the same gathering viz. Zeyher 447 under both the vars. *brevestipitata* and *pseudohystrix*. Ecklon and Zeyher s.n. from Uitenhage at one time shared the same lot. Study of more comprehensive material however has shown that the forms of *A. diffusa* having short columns (up to 4 mm.) should all be placed under the var. *Pseudo-Hystrix*.

CAPE PROVINCE.

Cape distr.: Little Lion's Head, III. 1936, Adamson 808 (U). Tulbagh distr.: Winterhoek, Zeyher NH. 8685 (N). Riversdale distr.: Near Riversdale, XI. 1892, Schlechter 1764 (BH, G). Laingsburg distr.: Whitehill, VIII. 1923, Compton 2881 (BH). Uitenhage distr.: On fields near Zwartkopsrivier, Zeyher 447 (A, BH, K, N, O, Z); do., Zeyher 849 (B); between Kogea and Sundays Rivers, Ecklon et Zeyher (A, BH, N); Redhouse,

X. 1908, *Paterson* 263 (A, BH); Zwartkopsrivier, *Drège* (LG); Olifantshoek along Bushman River, *Drège* (B). Port Elizabeth distr.: Port Elizabeth, *E.S.C.A. Herb.* 121 (K). Murraysburg distr.: Murraysburg, III. 1879, *Tyson* 1697 (D). Somerset East distr.: Between Little and Great Fish Rivers, *Drège* (LG).

WITHOUT PRECISE LOCALITY.

Rohlmeyer s.n. (B); *Verreaux* s.n. (G); *Boivin* s.n. (K); *Zeyher* s.n. (LG).

TYPE SPECIMEN.

The specimen on which Trinius et Ruprecht based their description is deposited in the Trinius Herbarium, Leningrad. It bears no data as to collector or precise locality but "Ar. vestita var. A. Pseudohystrix Cap. b. sp. 1837".

59. *A. mollissima* *Pilger* in *Engl. Bot. Jahrb.* **40**. 80 (1908); *Schultze*, Namaland et Kalahari 581 (1907) nomen tantum; *Henrard Crit. Rev.* **2**. 354 (1927); *Henrard Monogr.* **1**. 99 cum ic. tab. 30 (1929).

A. elymoides *Mez* in *Fedde, Rep.* **17**. 148 (1921); *Henrard Crit. Rev.* **1**. 166 (1926).

A densely caespitose erect fairly robust *perennial*, including the culms up to 80 cm. high. *Culms* strictly erect, many-noded, simple, or more rarely scantily branched from the upper nodes; nodes glabrous; internodes exserted, up to 20 cm. long, densely woolly or lanate-tomentose, more or less terete, greenish. *Leaf sheaths* pallid; the lower lax and slipping off the culms, striate, almost glabrous or fairly densely woolly tomentose; the upper sheaths glabrous, striate, smooth, terete and tight; *ligule* a short hairy rim, auricles with a flake of wool or merely ciliate; collar glabrous or minutely pubescent; *blades* linear (the lower) to filiform (the upper), up to 30 cm. long and 3 mm. wide, but usually much shorter, and narrower, involute, erect or somewhat spreading, acute, lower surface glabrous, smooth and striate, the upper surface scaberulous, tip acute but not pungent. *Panicle* usually sheathed by the uppermost leaf or shortly exserted, narrow, very dense and spike-like, up to 20 cm. long; axis densely lanate; branches numerous and very short, adpressed, somewhat lanate. *Spikelets* almost sessile, narrow, glabrous, pallid, erect. *Glumes* very unequal, shortly awned narrowly-lanceolate, 1-nerved, scabrous on the keel, and minutely scaberulous upwards; the lower from 10-14 mm. long; the upper from 17.5-24 mm. long. *Lemma* including the callus and up to the articulation 8.5-10 mm. long, tubercus, smooth and very minutely granular; *callus* 2-2.5 mm. long, acute, densely but shortly hairy; column of the awns 17-26 mm. long, strongly twisted, scabrous; awns more or less equal, scabrous, spreading, 2.8-5.5 cm. long.

SOUTH WEST AFRICA.

Okavango area, Runtu, V. 1939, *Volk* 1741 (D).

BECHUANALAND PROTECTORATE.

Between Senuma (Sekoma?) and Kooa (Kooi?), I. 1905, *Schultze* 342 i (B, N); Sevrelela (Sevrelela?), X. 1904, *Schultze* 241 a (B).

CAPE PROVINCE.

Mafeking distr.: Mafeking, IV. 1929, *Pole Evans* 2435 (K, N). Kimberley distr.: Picardi, III. 1936, *Wilman* 4089 (B, K, L, Mc, N, V, Z).

ORANGE FREE STATE.

Kroonstad distr.: Bothaville, VI. 1931, *Boshoff* 8 pro parte (N); do., I. 1933, *Goossens* 1175 (B, N).

TYPE SPECIMEN.

Schultze 342 i is deposited in the Botanisches Museum, Berlin-Dahlem. The specimen is overmature and thus poor.

60. *A. stipitata* Hack. ap. Schinz in Verh. Bot. Ver. Prov. Brandenb. **30**. 143 (1888); Dur. et Schinz, Consp. **5**. 809 (1894); Hack. in Bull. Herb. Boiss. **4**. Append. III. 19 (1896); Stapf in Dyer, Fl. Cap. **7**. 560 (1899) sub. *A. sieberiana* Trin. var.; Dinter in Fedde, Rep. **15**. 342 (1918); Garabedian in Ann. S. Afr. Mus. **16**. II. 405 (1925); Henrard Crit. Rev. **3**. 590 (1928); Henrard Monogr. **1**. 106 cum ic. tab. 35 (1929); Range in Fedde, Rep. **33**. 9 (1933); Theron in Fedde, Rep. **40**. 28 (1936) [*sphalm. stipitata*].

Densely caespitose erect *perennial*. Culms up to 100 cm. high, robust, glaucous, simple below, usually branched from the upper nodes; internodes compressed (?), glabrous; nodes exserted, glabrous. *Leaf-sheaths*, broad, slipping from the culms, glabrous; *ligule* a ciliate rim; *blades* flat or at length involute, up to 20 cm. long and 2–3 mm. wide, glabrous on the lower surface, scaberulous on the upper surface, glaucous. *Panicle* almost spicate, narrow, dense, contracted, up to 25 cm. long; branches binate, branched from near the base; branchlets and pedicels short. *Glumes* unequal, glabrous; the lower about 10–13 mm. long, scabrous on the keel, acuminate, shortly awned; the upper 20–22 mm. long. *Lemma* 9–10 mm. long including the callus, tubulous, finely punctulate; *callus* \pm 3 mm. long, very acute, densely hairy; column of awns up to 40 mm. long, strongly twisted; awns subequal, capillary, up to 60 mm. long.

SOUTH WEST AFRICA.

Omatope, II. 1886, Schinz 658 (K, N, V, Z); Onumakunde, Rautanen 8 (P); Okahandja, II. 1928, Bradfield 278 (T); Gobabis, XII. 1921, Wilman s.n. (BH, S).

TYPE SPECIMEN.

Schinz 658 in the Botanisches Museum, Zürich and the Naturhistorisches Museum, Wien are to be regarded as the type.

61. *A. graciliflora* Pilger in Engl. Bot. Jahrb. **33**. 599 (1907); Henrard Crit. Rev. **1**. 211 (1926); Henrard Monogr. **1**. 112 cum ic. tab. 40 (1929).

A. ramifera Pilger in Engl. Bot. Jahrb. **33**. 59 (1907); Henrard Crit. Rev. **3**. 492 (1928); Henrard Monogr. **1**. 114 cum ic. tab. 40 (1929). *A. Sieberiana* Trin. sec. Stapf in Dyer, Fl. Cap. **7**. 560 (1899); Stent in Bothalia **1**. IV. 278 (1924); Garabedian in Ann. S. Afr. Mus. **16**. II. 404 (1925), omnes non Trin. *A. stipitata* Hack. sec. Eyles in Trans. Roy. Soc. S. Afr. **5**. IV. 304 (1916) excl. syn., non Hack.

Robust erect caespitose *perennial*. Culms simple below but usually branched from the upper nodes, up to 120 cm. high, about 5-noded; internodes more or less equal, terete, obscurely striate, glabrous, somewhat glaucous; nodes glabrous, exserted. *Leaf-sheaths* glabrous, striate; the lower more or less rigid, lax, the upper fairly lax, glaucous and at length slipping from the culms; *ligule* a ciliate rim; auricles densely long-bearded or only pubescent; collar pubescent or glabrous; *blades* variable in length, up to 30 cm. long, linear, usually convolute, erect or spreading, glabrous and striate on the lower surface, scaberulous on the upper surface. *Panicles* erect, sub-spicate to fairly lax and interrupted, about 20 cm. long, branches adpressed to the rachis or eventually spreading on maturity, solitary to 3-nate, angular, scaberulous on the angles; pedicels slightly scaberulous, usually shorter than the glumes. *Glumes* unequal, acute, awned; the lower about 10 mm. long, scaberulous on the keel; the upper up to 20 mm. long, minutely scaberulous upwards. *Lemma* tubular, somewhat mottled with purple, glabrous, finely punctulate, including the callus up to 11 mm. long; *callus* very acute, densely hairy, 2 mm. long; column of awns very variable in length, up to 25 mm. long, strongly twisted; awns subequal, capillary, spreading, up to 60 cm. long.

SOUTH WEST AFRICA.

Onumakunde, III. 1905, Rautanen 8 (Z); Waterberg, V. 1928, Bradfield 388 (K, N); do., I. 1939, Volk 1002 (D); Neidsas, IV. 1939, Volk A. 155 (D); Olamakaris ?, II. 1939, Volk 1191 (D).

CAPE PROVINCE.

Hay distr. : Near Postmasburg, VI. 1929, *Uys* G. 17 (N). Kimberley distr. : Kimberley, I. 1937, *Acock* 1626 (K, Mc); Carter's Ridge, I. 1937, *Acock* 1605 (K, Mc); Riverton, III. 1918, *Wilman* 2522 (BH, Mc). Barkly West distr. : Droogveld, II. 1934, *Cooke* 3235 (K); Waldeck's Plant, V. 1936, *Cooke* s.n. (K) et XII. 1936, *Acock* 1432 (Mc). Kuruman distr. : Cowley, VI. 1936, *Acock* 458 (Mc). Vryburg distr. : Armoedsvlakte, III. 1921, *Mogg* in Herb. Stell. 12610 (St).

ORANGE FREE STATE.

Boshof distr. : Smitskraal, VI. 1911, *Burt Davy* 10319 (N) et 10366 (N). Hoopstad distr. : Wesselsbron, I. 1933, *Goossens* 1250 (N); De Rots, II. 1933, *Goossens* 1283 (N). Kroonstad distr. : Bothaville, I. 1933, *Goossens* 1152 (B, N) et 1176 (B, N); do., IV. 1931, *Boshoff* 8 (N). Heilbron distr. : Maccauvlei, II. 1926, *Brandmuller* 118 (N).

TRANSVAAL PROVINCE.

Bloembhof distr. : Christiana, III. 1912, *Burt Davy* 13030 a (N) et 13113 (N); Cawood's Hope, III. 1912, *Burt Davy* 12984 (N); Kameelpan, I. 1934, *Theron* 527 (N). Wolmaransstad distr. : Boskuil, V. 1929, *Sutton* 112 (N); Vaalbank, IV. 1931, *Liebenberg* 2355 (N, W). Potchefstroom distr. : Ventersdorp, III. 1931, *Pole Evans* 3144 (B, N) et without locality *Theron* 4 (N). Rustenburg distr. : De Put, II. 1933, *Van Nouhuys* 22 (T). Pretoria distr. : Pretoria, XII. 1929, *Liebenberg* 8330 (B, K, N, W); do., IV. 1933, *Smith* 6567 (N); De Wildt, II. 1933, *Irvine* s.n. (N); Klipfontein, VIII. 1880, *Nelson* 103 (K); between Klippan and Elandsrivier, *Rehmann* 5111 (BM, K, V, Z). Waterberg distr. : Twenty-four Rivers, XII. 1919, *Burt Davy* 18259 (K) et 18260 (K); Naboomspruit, I. 1919, *Galpin* M. 425 (N, W); Potgietersrust, I. 1909, *Leendertz* 1983 (T). Zoutpansberg distr. : Messina, II. 1919, *Rogers* 22576 (T). Barberton distr. : Komatipoort, XII. 1897, *Schlechter* 11744 (A, BH, N).

BECHUANALAND PROTECTORATE.

Mahalapye, IV. 1931, *Pole Evans* 3204 (K, N) et 3207 (N).

PORTUGUESE EAST AFRICA.

Ressano Garcia, XII. 1897, *Schlechter* 11934 (A, B, BH, BM, G, K, P, V, Z); Lourenco Marques, XII. 1897, *Schlechter* 11966 (BH, BM, G, K, N, P, Z); do., I. 1898, *Schlechter* 11984 (A, B, BH, BM, G, K, N, P, Z); do., *Monteiro* s.n. (K); do., *Junod* 23 (T); do., X. 1919, *Shantz* 337 (K, W); do., VII. 1922, *Moss* 6907 (WR). Chibuto, X. 1935, *Lea* 135 (N); *Maputaland Expedition*, VI. 1914, T.M. 14338 (BH, T).

TYPE SPECIMEN.

Schlechter 11984 is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAME.

Steekgras.

ECONOMIC NOTES.

Opinion differs as to the value of this species as a fodder for stock. It is stated to be eaten in South West Africa whereas in the Western Transvaal and the Orange Free State it is reported to be very coarse and thus unpalatable.

62. *A. hordeacea* Kunth Rev. Gram. 2. tab. 173 (1830); Kunth, Enum. 1. 196 (1833); Walp. Ann. Bot. 3. 746 (1852); Steud. Syn. Pl. Glum. 1. 142 (1854); Dinter in Fedde, Rep. 15. 342 (1918) [spalm. *hordeacea*]; Garabedian in Ann. S. Afr. Mus. 16. II. 402 (1925); Henrard Crit. Rev. 2. 241 (1927); Henrard Monogr. 1. 140 cum ic. tab. 54 (1929); Range in Fedde, Rep. 33. 9 (1933).

A. hordeacea Kunth var. *longiaristata* Henrard Crit. Rev. 2. 244 (1927); Henrard Monogr. 1. 140 (1929). *A. Steudeliana* Trin. et Rupr. Spec. Gram. Stip. 155 (1842); Henrard Crit. Rev. 3. 588 (1928).

Annual, usually fairly robust and much-branched from the base and lower nodes. *Culms* up to 85 cm. high including the inflorescence, or in weak specimens 20-30 cms. high, erect or somewhat geniculately ascending, several-noded; internodes fairly rigid, compressed, striate, densely pubescent with spreading or reflexed short hairs, sometimes becoming almost glabrous, usually exserted; nodes constricted, more or less densely pubescent. *Leaf-sheaths* striate, compressed, keeled, pubescent, with narrow hyaline margins, usually shorter than the internodes; *ligule* shortly ciliate; auricles shortly bearded; collar smooth; *blades* linear-lanceolate, more or less glaucous, flat or folded lengthwise, keeled, acute, scabrous on both surfaces or hirtellous above, many-nerved, up to 30 cm. long and 0.9 cm. wide. *Panicle* linear-oblong or subovate, exserted, in robust plants up to 24 cm. long, but usually much shorter, densely contracted, compact and spike-like, usually only somewhat interrupted at the base; peduncle and axis densely pubescent; branches solitary much-divided from the base; branchlets and spikelets fascicled; pedicels short and pubescent. *Spikelets* congested, linear-lanceolate, greenish or pallid in colour. *Glumes* lanceolate, manifestly awned, 1-nerved, keeled, bifid near the apex, scaberulous dorsally; the lower scabrous on the keel, from 6-11 mm. long excluding the 2.5-5 mm. long awn; the upper smooth on the keel, 7-12 mm. long excluding the 1-4 mm. long awn. *Lemma* narrowly linear, fusiform, with many longitudinal lines of characteristic spiny hairs from the base to the summit, ventrally somewhat furrowed, narrowed towards the apex, up to 7.5 mm. long including the callus, articulation evident; *callus* rounded, short, densely bearded, about 0.5 mm. long; awns subequal, scabrous, erect or somewhat spreading, from 35-50 mm. long.

ANGOLA.

Between Gamboas and Cabama, V. 1909, *Pearson* 2481 (V) et 2482 (V); without precise locality, VI. 1936, *Martins* 33 (N).

SOUTH WEST AFRICA.

Andoni, *Barnard* 813 (K, N, S); Ossa, III. 1939, *Volk* 1564 (D); Fockshof, IV. 1939 *Volk* A. 156 (D). Tsumeb, III. 1934, *Dinter* 7444 (B, N); do., IV. 1913, *Engler* 6105 (B, K, N); Otavi, III. 1925, *Dinter* 5751 (BH, G, GU, N, S, Z); Okatjongeama, *Dinter* 1587 (B); do., *Seiner* 527 (B); Duwib, *Boss* TM. 36022 et 36166 (T); between Okahandja and Waterberg, *Kolon. Wützenhausen* s.n. (B); Hoachanas, III. 1911, *Dinter* 1933 (B).

WITHOUT PRECISE LOCALITY.

Lüderitz 41 (B, Z) et 65 (B, Z); Bumbo, IV. 1903, *Fritzsche* 17 (B).

BECHUANALAND PROTECTORATE.

Francistown, IV. 1929, *Gordon* 49 (N).

TYPE SPECIMEN.

The type is deposited in the Botanisches Museum, Berlin-Dahlem.

COMMON NAMES.

Sauergras. Wilde Gerste.

ECONOMIC NOTES.

This species is not readily eaten by stock. In the young condition however it is eaten to some extent, whereas in the mature condition it is injurious on account of the awns which penetrate the palates of stock.

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