

# SOUTH AFRICAN GRAMINEAE.

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## THE SOUTH AFRICAN SPECIES OF SPOROBOLUS.

### HISTORY OF THE GENUS.

THE genus *Sporobolus* was founded by Robert Brown in 1810, and based on *Agrostis indica*, L. He describes three species—*Sporobolus indicus*, *Sporobolus elongatus*, and *S. pulchellus* (*R. Brown Prod.*, 1, p. 170). The characters of the new genus he describes as follows:—(Translated.) Glumes 2, 1-flowered, muticous, unequal, outer smaller. Valves of the perianth, muticous, minutely acute; sessile, beardless, longer than the glumes. Lodicules 2, hypogynous. Stamens 2–3. Styles 2. Stigmas villous. Seed (*cariopsis* Rich.) obovate, ventricose, free, deciduous.

Tropical grass rarely occurring beyond 35° latitude. Inflorescence paniculate. Mouth of the sheaths bearded, ligule obsolete.

Brown also included *Agrostis diandra* Retz. under the new genus, but retained *Agrostis virginica* L. under *Agrostis*, an account of the long upper glume.

Palisot de Beauvois, in his "Agrostographia," 1812, retained the genus *Sporobolus* practically as Brown established it. In his "Tabula methodica" it is placed under cohort I, spikelets 1-flowered, section 4; lower glume the smaller; valve muticous. He also included several grasses now valid under *Sporobolus* in his genus *Vilfa*, which he places in the same cohort as *Sporobolus*, but in section 3; lower glume the larger, valve with terminal bristle.

It is obvious that Beauvois did not know his species too well since he collected a very heterogenous lot of grasses under this genus *Vilfa*, many of which do not conform to his own limits of the genus.

In 1833 Kunth reconstituted the genus *Sporobolus* in a wider sense, and his conception of it has been more or less adopted by present-day botanists.

Trinius ("Agrost.," 1840), following after Kunth, accepted the limits of the genus as proposed by that botanist, but upheld Adanson's name *Vilfa* as being the older and therefore having priority.

Adanson's *Vilfa*, however, created in 1763, was based on *Agrostis stolonifera*, a true *Agrostis*, and did not in any way correspond to *Sporobolus* of Brown.

The name *Sporobolus* is therefore now unanimously accepted for this genus.

### SPOROBOLUS, R. B. PROD.

*Spikelets* small  $\frac{1}{2}$ –4 mm. long, quite glabrous, 1-flowered (in African species), variously paniculate, rhachilla very short, continuous with the pedicel, tardily disarticulating, only produced in one known species; flower hermaphrodite. *Glumes* equal or unequal, the lower often very small, 1-nerved or nerveless, emucronate, seldom keeled, persistent or caducous. *Valve* muticous, unawned, as long as or exceeding the glumes or sometimes very slightly shorter; 1–3-nerved, glabrous. *Pale* equalling the valve or a little shorter, 2-nerved, often canaliculate between the nerves, obtuse, truncate, emarginate or minutely bilobed, sometimes splitting to the base; callus minute, glabrous. *Stamens* 2–3. *Styles* short, distinct with plumose stigmas. *Lodicules* small, delicately hyaline, truncate. *Grain*

free and deciduous, or in some species attached by the base of the pericarp, which, ultimately bursting, ejects the seed; hilum basal, punctiform; embryo equalling half or less the length of the seed, pericarp delicate, loose, more or less swelling in water.

Perennial or sometimes annual grasses, blades flat, folded, or setaceously convolute, ligule a usually very short fringe of hairs. Panicles spikelike or open, often delicately effuse.

Nearest in affinity to *Agrostis*, which differs from it principally in the usually 5-nerved, rarely 3-nerved valves, always shorter than the equal or subequal glumes, and of a more delicate texture, and in the membranous ligule.

The spikelets of *Agrostis* are always a rather pale fresh green, while those of *Sporobolus* are usually from grey to dull yellow and brown.

#### KEY TO THE SPECIES.

Section 1.—*Eu. Sporobolus* (Stapf), rhachilla not produced.

Panicle when mature lax, broadly ovate, lanceolate or subpyramidal, seldom somewhat contracted, usually not more than four times as long as broad, if narrower than the spikelets 3-4 mm. long. [See (15) *artus*.]

Annual.

Culms up to 40 cm. long; leaves narrow linear; branches of panicle regularly whorled simple, 1-3 spiculate. . . . . (1) *panicoides*.

Culms not more than 15 cm. long (usually much shorter); leaves short, blades ovate lanceolate; branches often many spiculate.

Culms up to 6 cm. high; leaves obtuse, margins minutely spinulose; spikelets appressed to the rhachis (2) *parvulus*.

Culms up to 15 cm. high; leaves acute, margins conspicuously rigidly ciliate; spikelets secund, pendulous. . . . . (3) *discosporus*.

Perennial.

Culms not over 15 cm. high.

Panicle contracted, up to 5 cm. long; leaf blades acute subpungent. . . . . (4) *albicans*.

Panicle open, lax; leaf blades very short with obtuse, truncate or emarginate tips. . . . . (5) *tenellus*.

Culms usually over 15 cm. high.

All or at least the lowest branches of the panicle whorled (except sometimes in *S. artus*); pedicels short; spikelets more or less appressed to the branchlets (often spreading in *iocladus*).

Spikelets greyish-green, under 3 mm.

Culms usually about 16-20 cm. high; rhizome branched, covered with closely imbricating sheath bases, innovation shoots short; leaf blades short and narrow, not exceeding 3 cm. × 3 mm. . . . . (6) *Ludwigii*.

Culms up to 40 cm. high; rhizome creeping, oblique or tufted, but not branched.

Basal sheaths becoming hard and shiny.

Branchlets of the panicle very short and appressed, therefore branches narrowly subspiciform above the base.

Leaves linear, under 3 mm. wide, margins straight, smooth, scaberulous or minutely spinulose. . . . . (7) *Vryburgensis*.

- Leaves ovate acuminate, flat, up to 5 mm. wide, with more or less undulate and spinulose ciliate margins. . . . . (8) *nitens*.
- Branchlets of the panicle up to 2 cm. long, spreading; basal sheaths light straw-coloured, up to 9 cm. long. . . . . (9) *iocladius*.
- Basal sheaths thinly membranous striate, not hardening.
- Leaf blades ovate acuminate from a rather broad and clasping base, margins minutely but distinctly pectinate ciliate. . . . . (12) *Smutsii*.
- Leaf blades linear, tapering to a subobtuse apex from a scarcely wider base, margins scabrous, but not ciliate.
- Innovation shoots densely crowded on oblique rhizome; leaves glaucous; spikelets obtuse rather less than 2 mm. . . . . (10) *Gillii*.
- Plant stoloniferous with few innovation shoots; leaves green; spikelets acute, 2 mm. or slightly more. . . . . (11) *usitatus*.
- Spikelets dark brownish-green or brownish-yellow, seldom grey, never less than 3 mm.
- Basal sheaths membranous or thinly chartaceous, finely striate, not becoming hard and polished.
- Panicle ovate, lax, open or somewhat contracted.
- Panicle up to 7 cm. long; leaf blades narrow (not exceeding 3 mm. wide), rather flaccid, long, tapering to a setaceous point, ciliate or scabrid on the margins. . . . . (13) *centrifugus*.
- Panicle up to 17 cm. long; leaf blades wider (up to 5 mm.), rigidly nerved, flat, acutely acuminate, conspicuously ciliate. . . . . (14) *pectinatus*.
- Panicle contracted spikelike (Natal species) . . . (15) *artus*.
- Basal sheaths firm, becoming hard and polished, outer ones not at all or obscurely striate.
- Culms slender, sheaths narrow and rather tight; blades of the culm-leaves narrow and rather reduced.
- Leaves setaceously convolute; basal sheaths pale to deep straw-coloured throughout. . . (16) *filifolius*.
- Leaves flat, basal sheaths tinged with brownish-red. . . . . (17) *Tysonii*.
- Culms stout; sheaths of the culm loose and up to 15 mm. wide; blades of the culm-leaves rather broad and well developed, especially the lower ones; panicle up to 18 cm. long. . . (18) *laxevaginatius*.
- Branches of the panicle solitary or binate, never whorled; spikelets on comparatively long, fine spreading pedicels.
- Basal sheaths persistent, splitting into fibres.
- Basal sheaths covered with tawny, fugacious curled hairs and forming a dense tuft of matted fibres at the base; axils of the panicle glabrous. . (19) *stuppeus*.

- Basal sheaths more tardily splitting into fibres and not forming a matted fibrous tuft.
- Axils of the panicle glabrous; leaves narrow, 2-4 mm. broad, margins finely cartilaginous, scaberulous..... (20) *festivus* var. *fibrosus*.
- Axils of the panicle bearing tufts of fine white hairs; leaves not more than 1 mm. wide, with very much thickened margins..... (21) *micranthus*.
- Basal sheaths not splitting into fibres; rhizome branched; blades short, subpungent; axils of the panicle bare..... (22) *acinifolius*.
- Panicle long and narrow, usually much more than four times as long as broad (except in some specimens of *Fourcadii*), contracted or spikelike, or if rather broad and open then correspondingly long.
- Both glumes equalling the length of the spikelet..... (23) *robustus*.
- Upper glume more or less equalling the spikelet, lower shorter.
- Panicle narrow, contracted, and spikelike; rhizome long creeping. Maritime plants..... (24) *virginicus*.
- Panicle long, loosely spreading, or sometimes the branches more or less ascending, but never spikelike. Tufted grass (25) *fimbriatus*.
- Both glumes shorter than the spikelet.
- Panicle elongate, branches more or less spreading or ascending, not spikelike.
- Branches few, solitary, scattered; rhizome shortly creeping..... (26) *Fourcadii*.
- Branches solitary and irregularly crowded or subverticillate, spreading or obliquely ascending.
- Culms rather stout; upper glume always obtuse and not exceeding half the spikelet. Tropical or subtropical grass..... (27) *pyramidalis*.
- Culms more slender; upper glume often acute or subacute and exceeding half the spikelet. Grass of the coastal regions..... (28) *indicus* var. *laxus*.
- Panicle very narrow, spikelike, sometimes interrupted.. (28) *indicus*.
- Section 2.—*Chaetorhachia* (Stapf), rhachilla produced into a bristle half as long or as long as the spikelet. Only species.. (29) *subtilis*.

1. *S. panicoides*, Rich. (Flor. Abyss. II, 399).

Annual tufted. *Culms* slender, branched, glabrous, up to 40 cm. long, 4-5-noded, lowest internode short, succeeding gradually longer and more or less exerted; *sheaths* of the leaves thin, loose, narrow, sulcate compressed and keeled, glabrous except along the often softly ciliate margins and at the mouth, ligule ciliate; *blades* narrow linear, attenuating to a long, fine acute point, flat or folded, up to 16 cm. long  $\times$  5 mm. wide, thin and flaccid, glabrous, finely scaberulous above and on the margins, smooth beneath, keeled in the lower portion, with 3 primary lateral nerves on either side the midrib. *Panicle* quite glabrous, narrow oblong to ovate, open, 8-20 cm. long  $\times$  4-6 cm. broad; *branches* simple, 1-3 spiculate, regularly verticillate, lowest whorl of 12-20 branches up to 3 cm. long and ascending or spreading, those of the succeeding whorls usually fewer and rather shorter; lateral pedicels very short, clavate. *Spikelets* 3 mm. long, narrow, ovate acuminate, greenish-yellow, flushed with purple; *glumes* very unequal, lower equalling about 0.3 of the spikelet, ovate acuminate, thinly membranous, flushed with purple at the base, nerveless; *upper* equalling or slightly exceeding the spikelet and clasping it

at the base, 1-nerved, ovate acute, the margins reflexed towards the tip so that the glume appears to be narrowly acuminate, flushed with purple at the base and towards the tip, smooth; *valve* resembling the glume, often faintly 3-nerved; *pale* equalling the valve, rather broad truncate or emarginate at the tip, scaberulous towards the base, 2-nerved, folded down the centre and easily splitting to the base; *stamens* 3, anthers 1 mm. long; *lodicules* short, truncate; *ovary* ovate on a short gynophore; *stigma* distinct, short; *grain* globose, reddish-brown to pale straw-coloured, *embryo* equalling less than 0.5 of the grain, dark, *hilum* punctiform; pericarp swelling and dehiscing in water; *testa* mucilaginous.



Plate I.  
*Sporobolus parvulus* Stent.

Pretoria Dist. : Bushveld on Farm Rooikop, *Smuts* (in *Nat. Herb.* 2874); Zoutpansberg Range, N. Transvaal, *Smuts* (in *Nat. Herb.* 2879).

A tropical grass recorded for the first time within the Union.

2. *S. parvulus*, Stent, n. sp.\* [Plate I.]

Small annual. *Culms* up to 6 cm. long, ascending, slender, smooth, glabrous, 1-noded; *basal sheaths* loose, up to 5 mm. long, thinly membranous, sulcate, glabrous; with a few rigid acute tubercle-based bristles on the margin near the mouth, culm sheaths tight, up to 20 mm. long; *ligule* a rather irregular fringe of hairs; *blades* ovate lanceolate, flat or folded, up to 12 mm. long  $\times$  2.5 mm. wide, rounded and somewhat clasping at the base, narrowing to an obtuse apex, glabrous, finely ribbed and scaberulous on the upper surface, smooth below, margins cartilaginous and minutely spinulose. *Panicle* ovate to lanceolate, 16–22 mm. long  $\times$  10–16 mm. wide; lowest *branches* 3–5 in a whorl, upper whorled, binate

\*Latin diagnoses of new species arranged alphabetically at the end of the paper.

or solitary, undivided for half their length, branchlets short, appressed 1-3 usually 2 spiculate, lateral pedicels very short; *spikelets* dark olive-green, lanceolate, 1 mm. long; *glumes* very unequal, *lower* very small, hyaline, ovate obtuse, 0.3 mm. long, nerveless, *upper* ovate, lanceolate, subacute, the length of the spikelet, 1-nerved; *valve* resembling the upper glume, 1-nerved; *pale* bilobed, and toothed at the apex, very readily splitting to the base; *stamens* 3, anthers 0.4 mm. long, ovate; *caryopsis* 0.7 mm. long, pericarp swelling in water.

ORANGE FREE STATE.—Boshof Dist.: Smitskraal, *Burt-Davy* 10127 (in *Nat. Herb. Pret.*).

Near to *S. tenellus*, from which it differs in the larger upper glume, smaller panicle with appressed branchlets, annual habit, and laxer and more distant leaves. *Kensit* in *Herb. Bolus* 17638, from Mortimer, Cape Province, is an annual that resembles this very closely, but is larger in all its parts, the culms reaching a height of 10.5 cm., with panicles 3 cm. × 3 cm. The spikelets are rather lighter-coloured. It is possible that *Burt-Davy's* plant, from which I have described the species, is a somewhat dwarfed specimen; there are, however, six or seven plants on the sheet all representing the same form. I hesitate to include *Kensit's* plant, coming as it does from a very different part of the country, till I have more material.

### 3. *S. discosporus*, Nees (Fl. Afr. Austr., 158).

Annual. *Culms* 4-15 cm. long, slender, glabrous, smooth, erect or geniculate, 1-2-noded; *basal sheaths* short, thinly membranous between the conspicuous ribs, glabrous, 4-5 mm. long, those of the culms narrow, tight, sulcate, rather shorter than the internodes; *ligule* a fringe of hairs; *blades* linear or lanceolate acute, very short, 4-15 mm. long and 4 mm. wide, that of the uppermost internode often much reduced, glabrous, smooth, finely and closely striate, margins cartilaginous, subserrate and ciliate, with rigid acute bristles about 1.5 mm. long. *Panicle* erect, ovate to lanceolate, lax, 2-5 cm. long × 1.5-3 cm. wide; *branches* verticillate, patent, undivided for about half their length. *Spikelets* secund, drooping, 1.3 mm. long, dark olive-green; *glumes* very unequal, *lower* equalling about one-third the spikelet, delicate, narrow ovate acute, nerveless, *upper* equalling the spikelet, broad, concave, acute, 1-nerved, nerve usually purplish, scabrid; *valve* like the glume, faintly 1-nerved; *pale* as long as the valve; *stamens* 3, anthers 0.3 mm. long; *caryopsis* flat, round, lenticular, 1.2 mm. long.

CAPE PROVINCE.—Kwysna Div.: Between Plettenberg Bay and Flats Station, *Burchell* 2750 (*Alb. Mus. Herb.*). Aliwal North Div.: On stony plateau at Kraai River, *Drège* (*Herb. Mus. Austr. Afr.*). Basutoland: Leribe, *Dieterlen* 660 (*Natal Herb.* 13784 and *Herb. Mus. Austr. Afr.* 6329). Veld, Kimberley, *Wilman* (*Herb. Bolus*). Hay Div.: Tyger Kop, *Wilman* (*McGreg. Mus.* 2205 and *Herb. Bolus*).

ORANGE FREE STATE.—Winberg, Hay, *Galpin* 7737 (in *Nat. Herb. Pret.*); Bloemfontein, Quaggafontein Pan, *Potts* 2446 (*Nat. Herb. Pret.*); Vereeniging, *Burt-Davy* 15200 (*Herb. Bolus*).

TRANSVAAL.—Bloemhof Dist.: Holwater, near Christiana, *Burt-Davy* 11233; Kaffraria, near Christiana, *Burt-Davy* 11409, 12778, 11389. Pretoria Dist.: Irene, near Pretoria, *Burt-Davy* 14657, *Pole Evans* 221; Kaalfontein, *Moyg* 3740. (All in *Nat. Herb. Pret.*). Sixmilespruit, near Pretoria, *Schlechter* 3580 (*Alb. Mus. Herb.* and *Herb. Pret. Mus.*).

Nees, in his original description of this plant, gives it as annual. Stapf, however, in the "Flora Capensis," describes it as a tufted perennial with short barren shoots from the base of the culms. All the plants I have examined are undoubtedly annual, and the original description is therefore the correct one.\*

\*After this revision had gone to press, Mr. C. A. Smith brought me specimens of a *Sporobolus* collected by him at Victoria West, Cape Province (*Smith* 2429 in *Nat. Herb. Pret.*). These I identified as *S. argutus* Kunth, a South American annual that has probably been introduced into this country with forage, etc., as have so many of our weeds. There is no doubt that *Bolus* 17638 from Mortimer, Cape Province, is the same species, and very little that *Burt-Davy's* specimens from Smitskraal, on which I have founded my new species *S. parvulus*, is merely a very dwarfed form of the same.

*S. argutus* agrees with the description of *S. parvulus* in every detail except as to measurements. The culms of the former are up to 30 cm. long and 2-noded, the panicle 4-6 cm. long and 3-4 cm. wide, the lowest whorl consisting of 8.12 or more branches. The spikelets are slightly larger

4. *S. albicans*, Nees (Fl. Afr. Austr., 154).

Perennial, tufted. *Culms* 3–15 cm. long, erect, glabrous, smooth, 1–2-noded, sheathed almost all along; *basal leaves* densely imbricate; *sheaths* glabrous, smooth, the lower short and broad, upper long, very tight; *ligules* a ciliate rim; *blades* lanceolate to linear, usually involute towards the tips and subpungent, the lowest 6 mm.  $\times$  2 mm. in the lower part, the upper up to 3 mm. broad; rigid, glabrous, smooth below, densely white papillose above, with rigid white cartilaginous margins. *Panicle* contracted, spikelets 3–5 cm. long, erect; *branches* solitary, up to 18 mm. long, filiform, laxly-branched and smooth, pedicels capillary as long as the spikelets or longer. *Spikelets* rather over 2 mm. long; *glumes* unequal, hyaline, the *lower* oblong, obtuse, nerveless, equalling about half the spikelet, *upper* lanceolate oblong, obtuse to subacute, 1-nerved, slightly shorter than the spikelet; *valve* 3-nerved, oblong obtuse, concave; *pale* slightly shorter; *stamens* 3, anthers 1 mm. long; *caryopsis* obliquely obovate, sub-compressed, 1 mm. long, pericarp swelling in water, testa mucilaginous, albumen opaque.

CAPE PROVINCE.—Queenstown Div.: Between Table Mountain and Wildschutz Berg, 4,000 ft., Drège.

This species has apparently never been collected since Drège collected it nearly a century ago, and his is the only record we have of it.

The construction of the spikelets, the character of the leaves, and general habit of the plant would suggest *Sporobolus acinifolius*, Stapf, from which it only differs in the very short culm and short contracted panicle.

5. *S. tenellus*, Kunth. (Enum. 1.215).

Perennial, densely caespitose with a much branched rhizome, branches short, densely covered with the imbricated sheaths and sheath bases; *culms* erect or ascending, very slender, 4–15 cm. long, glabrous, smooth, 1-noded; *sheaths* of the barren shoots, and basal leaves short, broad, firm, smooth, of the culm leaves tight, narrow, and finely striate; *ligule* a minutely ciliate rim; *blades* ovate to linear, with a broadly obtuse truncate or emarginate tip; 3–8 mm. long  $\times$  1–2.5 mm. broad, rigid, flat or folded, papillose or scaberulous above, finely and closely striate, margins cartilaginous and smooth. *Panicle* lax, erect, ovate, 2.5–4 cm. long; *branches* solitary, obliquely spreading, branched from about the middle, branchlets divaricate, pedicels about twice as long as the spikelets. *Spikelets* pallid or purplish with yellowish tips, up to 1.8 mm. long; *glumes* ovate, obtuse to subacute, *lower* equalling less than half the spikelet, nerveless, hyaline, *upper* rather more than half the spikelet, hyaline at the tips, firmer below, 1-nerved; *valve* obtuse, strongly 3-nerved; *pale* equalling the valve; *stamens* 3, anthers 1 mm. long.

CAPE PROVINCE.—Beaufort West Div.: Beaufort, Zeyher (in *Alb. Mus. Herb.*); Middelburg, Sim (in *Alb. Mus. Herb.* 2701).

ORANGE FREE STATE: Boshof, Burt-Davy 12399 (in *Nat. Herb. Pret.*); Hanover, Sim 5263 (in *Herb. Bolus*) Rosmead Junction Sim 5637 (in *Herb. Bolus*) Victoria West Div.: Hutchinson, Burt-Davy 17591 (in *Nat. Herb. Pret.*).

6. *S. Ludwigii*, Hochst. (in *Flora*, 1846, 118).

Perennial, rhizome creeping, covered with the persistent imbricate sheath bases, barren shoots crowded, short, stout, and closely sheathed. *Culms* very slender, 13–30 cm. long, 1–3-noded, glabrous, smooth, uppermost internode long exerted; *sheaths* of the barren shoots and culm bases closely imbricate, short, broad, firm, pallid, smooth, and finely striate, sometimes obscurely so, those of the culms tight and striate, shorter than the internodes; *ligule* a densely ciliate rim of hairs up to 1 mm. long; *blades* linear lanceolate, acuminate, subacute, finely ribbed, the lower 1–3 cm. long  $\times$  2–3 mm. wide; the upper ones rudimentary, flat, often curled or undulate, glabrous, smooth below, scaberulous above, with scabrid or smooth cartilaginous margins. *Panicle* erect, ovate, acute, lax, 3–8 cm. long  $\times$  2–5 cm. broad; the lowest *branches* whorled, the upper ones in

sub-whorls or solitary, obliquely erect or widely spreading, undivided for from 5–15 mm. from the base, branchlets 2–4 spiculate, lateral pedicels very short. *Spikelets* close, secund, rarely the branchlets alternate, dark olive or greyish-green, 1.5–2 mm. long; *glumes* very unequal, *lower* ovate, obtuse, hyaline, 0.5 mm. long, *upper* oblong obtuse, 1-nerved, 1.5 mm. long; *valve* like the upper glume; *pale* slightly shorter than the valve; *stamens* 3, anthers 1–1.5 mm. long; *grain* not seen.

CAPE PROVINCE.—Graaff-Reinet Div.: On stony hills at Sundays River, *Drège* (in *Herb. Mus. Afr. Austr.*). Griqualand West, in veld near Dutoitspan, *Tuck* (in *Herb. Mus. Afr. Austr.*). Vryburg, Elmar, *Burt-Davy* 14056a (in *Nat. Herb. Pret.*).

ORANGE FREE STATE.—Boshoff Dist.: Smitskraal, *Burt-Davy* 10125, 12950 (in *Nat. Herb. Pret.*).

TRANSVAAL.—Bloemhof Dist.: Christiana, *Burt-Davy* 12809, 12498 (in *Nat. Herb. Pret.*). Potchefstroom, *Burt-Davy* 847a (in *Nat. Herb. Pret.*).

A short-leaved spreading grass of the dry sandy regions of the Karroo and Thornbelt.

### 7. *S. vryburgensis*, Stent, n. sp. [Plate II.]

Tufted perennial, sometimes sending out rather stout, many noded stolons. *Culms* erect or geniculate, up to 60 cm. long, slender, glabrous, smooth, 2–3-noded, simple or more usually branched from the lower nodes; *sheaths* of the barren shoots about 4 cm. long, narrow, chartaceous, sub-compressed, faintly sulcate, pallid, glabrous, smooth; *ligule* a fringe of white hairs up to 1 mm. long; *blades* narrow linear, 2–3 mm. wide × 10 cm. long (or those of the barren shoots often shorter, narrower, and more rigid), flat or folded, smooth below, covered with minute blunt papillae above, scabrid on the margin, midrib rather stout, with primary lateral nerves 1–2 on either side. *Panicle* ovate acuminate, up to 13 cm. long × 6 cm. broad, lowest *branches* verticillate, the succeeding subverticillate or solitary, obliquely or occasionally widely spreading, mostly undivided for from one-third to half their length, the uppermost very short, more or less appressed and divided from the base, smooth or minutely scabrid, mottled with purple; branchlets very short, appressed, and more or less secund. *Spikelets* dark grey, 2 mm. or slightly more or less, shortly pedicelled or sessile, secund; *glumes* unequal, *lower* narrow oval obtuse or subacute, delicately hyaline, nerveless, equalling about half the spikelet, *upper* equalling or slightly exceeding and embracing the spikelet, obtuse or subobtuse, scaberulous on the back or smooth, 1-nerved, the nerve sometimes minutely excurrent; *valve* equalling the upper glume, obtuse or minutely emarginate, 1-nerved, scabrid on the keel or smooth; *pale* equalling the valve, 2-nerved, bilobed or emarginate; *stamens* 3, anthers 1.2 mm.; *caryopsis* ovate, compressed, 1 mm. long, albumen white, granular; pericarp very delicate, swelling in water.

CAPE PROVINCE.—Vryburg Div.: Armoedsvlakte, near Vryburg, *Foley* (in *Nat. Herb. Pret.* 2825), *Mogg* 8828.

TRANSVAAL.—Lichtenburg Dist.: Barberspan, *Pole Evans* 320 (in *Nat. Herb. Pret.*).

### 8. *S. nitens*, Stent (Bothalia, I, 281).

Perennial from oblique rhizome. *Culms* erect or prostrate ascending, sometimes rooting and branching from the lower nodes, compressed below, glabrous, shining, 1–2-noded, 13–30 cm. high, and sheathed almost to base of inflorescence; *sheaths* tight, striate, smooth, glabrous except along the margins, which are often hairy with tubercle based hairs, basal sheaths short, compressed, straw-coloured, very firm, shining, and persistent; *ligule* a densely ciliate rim; *blades* up to 6 cm. long × 7 mm. broad, seldom longer or broader, rounded and more or less clasping at the base, tapering to an obtuse or subacute apex, flat, very firm and finely ribbed, margins undulate, cartilaginous and minutely pectinate, glabrous or with a few tubercle based hairs, minutely scaberulous. *Panicle* ovate to lanceolate, 6–10 cm. long and 2.5–4 cm. broad, rachis and branches smooth; lowest *branches* whorled and ascending, seldom some or all of them spreading, the others single or in pairs arranged spirally on the axis, undivided for from half to two-thirds of their length, except



Plate II.

*Sporobolus vryburgensis* Stent.

the uppermost ones, which are very short and branched almost from the base; branchlets very short, more or less secund, appressed, 1-5 spiculate; pedicels very short. *Spikelets* 1.5 mm. long, secund; *lower glume* oblong, lanceolate, acute to subacute, nerveless, 1 mm. long; *upper glume* 1.5 mm. long, ovate acuminate, strongly 1-nerved, minutely pectinate ciliate on the keel; *valve* equalling or slightly exceeding the upper glume, strongly 1-nerved, acutely acuminate, smooth; *pale* equalling the valve, broad, narrowing to a bilobed tip, soon splitting to the base; *anthers* 3, reddish, about 0.4 mm.; *lodicules* oval, minute; *fruit* oval to round, pericarp swelling and bursting in water, testa not mucilaginous.

In the plain at the foot of the Magaliesberg Mountains, *Schlecht.* 3679; Rooikop Bushveld, Pretoria Dist., *Pole Evans* 667 (in *Nat. Herb. Pret.*); Gezina, Pretoria, *Fouche* and *Stent* (in *Nat. Herb. H.* 21445).

CAPE PROVINCE.—Albany Dist.: Near top of Koonap Heights, common along road, *Schonland* 3705 (in *Nat. Herb.* and *Herb. Alb. Mus.*).

Useful as a crop for sheep, but otherwise of little agricultural value.

9. *S. iocladus*, Nees (Fl. Afr. Aust., 161).

Perennial, densely tufted, rhizome oblique. *Culms* geniculate ascending, up to 60 cm. long, 2-4-noded, simple or occasionally with a branch from the lower or middle node; *basal sheaths* firm with thinner membranous margins, pallid, up to 10 cm. long, glabrous or hirsute; *ligule* densely ciliate; blades linear, narrow, 3-17 cm. long and 2-4 mm. wide, flat or convolute, tapering to a setaceous apex, glabrous or hairy, smooth below, and scaberulous above or scaberulous all over. *Panicle* erect, ovate lanceolate, 10-15 cm. long and up to 12 cm. broad, rachis smooth, slender, terete and striate, glabrous, lowest branches in a whorl of 7-9 obliquely ascending or widely spreading, the rest whorled, sub-whorled or solitary, longest up to 6 cm. long, divided from near the base or from 1-2 cm. above it, branchlets spreading, short, filiform, up to 2 cm. long, pedicels short. *Spikelets* greyish-green to dark olive-green, narrow, 2 mm. long; *glumes* very unequal, *lower* small, equalling one-third of the spikelet or less, nerveless or faintly nerved, broadly ovate obtuse, *upper* equalling or slightly exceeding the spikelet, oblong obtuse when flattened out, acute or subacute in profile, 1-nerved, slightly keeled, with reflexed margins at the tip; *valve* like the upper glume; *pale* slightly shorter; *stamens* 3, anthers 1 mm. long; *fruit* linear oblong, 0.75 mm. long.

CAPE PROVINCE.—Uitenhage Div.: Steenbokvlakte, *Ecklon* and *Zeyher* (*Alb. Mus. Herb.* and *Herb. Mus. Aust. Afr.*). Somerset East, in stony ground at Biesjesfontein, near Loots Kloof, *MacOwan* 1609 (*Alb. Mus. Herb.*). Graaff-Reinet, Klipfontein, *Burtt-Davy* 13526 (*Nat. Herb. Pret.*). Hanover, *Sim* 6262 (*Nat. Herb. Pret.*). Oudtshoorn Div.: Near Congo, on dry kopjes, *Bolus* 12428 (*Herb. Bolus*). West Cradock, *Holland* (*Herb. Bolus*).

TRANSVAAL.—Bloemhof Dist.: Banks of the Vaal, *Burtt-Davy* 1507 (*Natal Herb.* 12646).

The sheet in the Bolus Herbarium labelled *Bolus* 12428 bears under one number two plants presumably from one gathering. One plant typical *iocladus*, but the other has more or less appressed branchlets and spikelets very slightly more than 1 mm. long, with a comparatively smaller and narrower lower glume, otherwise it is typical.

10. *S. Gillii*, Stent, n. sp.

Perennial, rhizome oblique, densely beset with short barren shoots. *Culms* geniculate, ascending 30-45 cm. high, slender, glabrous, 2-3-noded, occasionally rooting from the lowest node, more or less compressed; *sheaths* glabrous, compressed or sub-compressed, the lower short, pallid, thinly membranous, upper green, narrow, rather tight, shorter than the internodes, finely ribbed; *ligule* a fringe of hairs; *blades* flat, glabrous, smooth or minutely scaberulous on the underside and margins, 2-3 mm. broad  $\times$  4-5 cm. long, tapering to a minutely obtuse apex, glaucous, finely ribbed, midrib slender, white. *Panicle* ovate lanceolate, acute, about 9 cm. long  $\times$  4-5½ cm. broad; branches whorled, spreading or the lower obliquely ascending, smooth, undivided for some distance above the base,

branchlets short, spreading or appressed, 2-3 spiculate; pedicels short to very short, the lateral spikelets often subsessile. *Spikelets* small, dark greenish-grey, acute before anthesis, then somewhat gaping and obtuse, 1.5-1.75 mm. long; *glumes* very unequal, *lower* very small, equalling 0.3 of the spikelet or much less, delicate, hyaline, nerveless, *upper* broad, equalling or rather shorter than the spikelet, 1-nerved; *valve* resembling the lower glume, 1-nerved, broadly obtuse; *pale* broad, emarginate, loosely folded down the centre; *anthers* 3.1 mm. long; *styles* short, stigmas plumose; *grain* not seen.

CAPE PROVINCE.—Middelburg, Grootfontein, *Gill* 7 (in *Nat. Herb. Pret.*).

Near to *S. iocladus*, from which it differs in the thin, short basal sheaths, shorter panicle, more obtuse spikelets, and also in the internal structure of the leaf.

11. *S. usitatus*, Stent, n. sp. [Plate III.]

Perennial; stoloniferous. *Culms* geniculate, often prostrate, ascending, 30-45 cm. long, glabrous, smooth, terete or sub-compressed in the lower part, slender, uppermost internodes long, sheathed to above the middle, the lower ones all short and sheathed to near the top; *lower sheaths* thinly membranous, glabrous, compressed, keeled, striate soon withering; upper firmer in texture, tight, sub-compressed and keeled, glabrous, finely striate; *ligule* a fringe of hairs; *blades* linear, tapering to a narrow subobtuse folded apex, green, glabrous, scabrous and minutely spinulose-ciliate on the cartilaginous margins, scaberulous on the underside towards the tip, about 4 mm. broad up to 8 cm. long, those of the barren shoots often slightly wider and shorter. *Panicle* ovate acuminate, up to 9 cm. long  $\times$  4-5 cm. broad, somewhat contracted or spreading; branches verticillate or occasionally the upper ones solitary, purple, delicate, smooth or scaberulous, undivided for from half to one-third of their length; branchlets short, 1-4 spiculate. *Spikelets* on short appressed pedicels, subsecund, 2-2.3 mm., greyish-green; *glumes* very unequal, *lower* narrow oval, obtuse, nerveless, subhyaline, equalling less than half the spikelet, *upper* the size of the spikelet, dark grey-green, strongly 1-nerved, subacute; *valve* like the upper glume, but slightly shorter; *pale* equalling the valve, delicate, and easily splitting; *anthers* purplish, 1.2 mm. long; *fruit* not seen.

CAPE PROVINCE.—Hay Div.: The flats, Tyger Kop, *Wilman* (in *Herb. Bolus* 17637); Bermolli, *Wilman* (*Herb. Bolus*).

TRANSVAAL.—Meintjes Kop, Pretoria, *Stent* (in *Nat. Herb. Pret.* H. 21624).

Not a very distinctive species, near to *S. Ludwigii*; it occurs plentifully in association with *Eragrostis*, spp.

12. *S. Smutsii*, Stent (Bothalia, I, 281).

Perennial. *Culms* prostrate, ascending, glabrous, many noded and often branched and rooting from the lower nodes, which are short, exerted; *barren shoots* often long, many and shortly noded, and leafy; *sheaths* short, membranous, keeled, tight, glabrous except at the bearded mouth and sometimes finely ciliate margins, or with a few scattered tubercle based hairs, finely striate, lower ones reddish; *ligule* a densely ciliate rim up to 1.5 mm. long; *blades* lanceolate, broadly clasping at the base and narrowing to an obtuse apex, 2.5-8 cm. long and 4-7 mm. wide, rigid, flat, glabrous, or hairy with tubercle based hairs, margins thick, cartilaginous, and pectinate, with small rigid, broad based, acute, ascending hairs, scabrid all over or quite or nearly smooth. *Panicle* erect, ovate, lanceolate, acute (rarely contracted into a spikelike inflorescence), 2-4 cm. broad and 8-10 cm. long; *branches* in whorls, or the upper ones more or less scattered, lowest up to 3.5 cm. long, undivided for from 0.5-1.25 cm., usually ascending, upper ascending spreading; branchlets short, up to 3 mm. long, more or less secund and appressed; *pedicels* very short. *Spikelets* 1.7-2 mm. long, greenish-grey, oblong, obtuse; *lower glume* small, 0.6 mm. long, delicate, nerveless, and obtuse; *upper* equalling the spikelet, distinctly 1-nerved, acute or subacute, boat-shaped with rounded keel; *valve* resembling upper glume, subacute, 1-nerved; *pale* truncate when expanded; *anthers* 3, 1.25 mm. long; *lopicules* truncate, minute; *grain* (?).

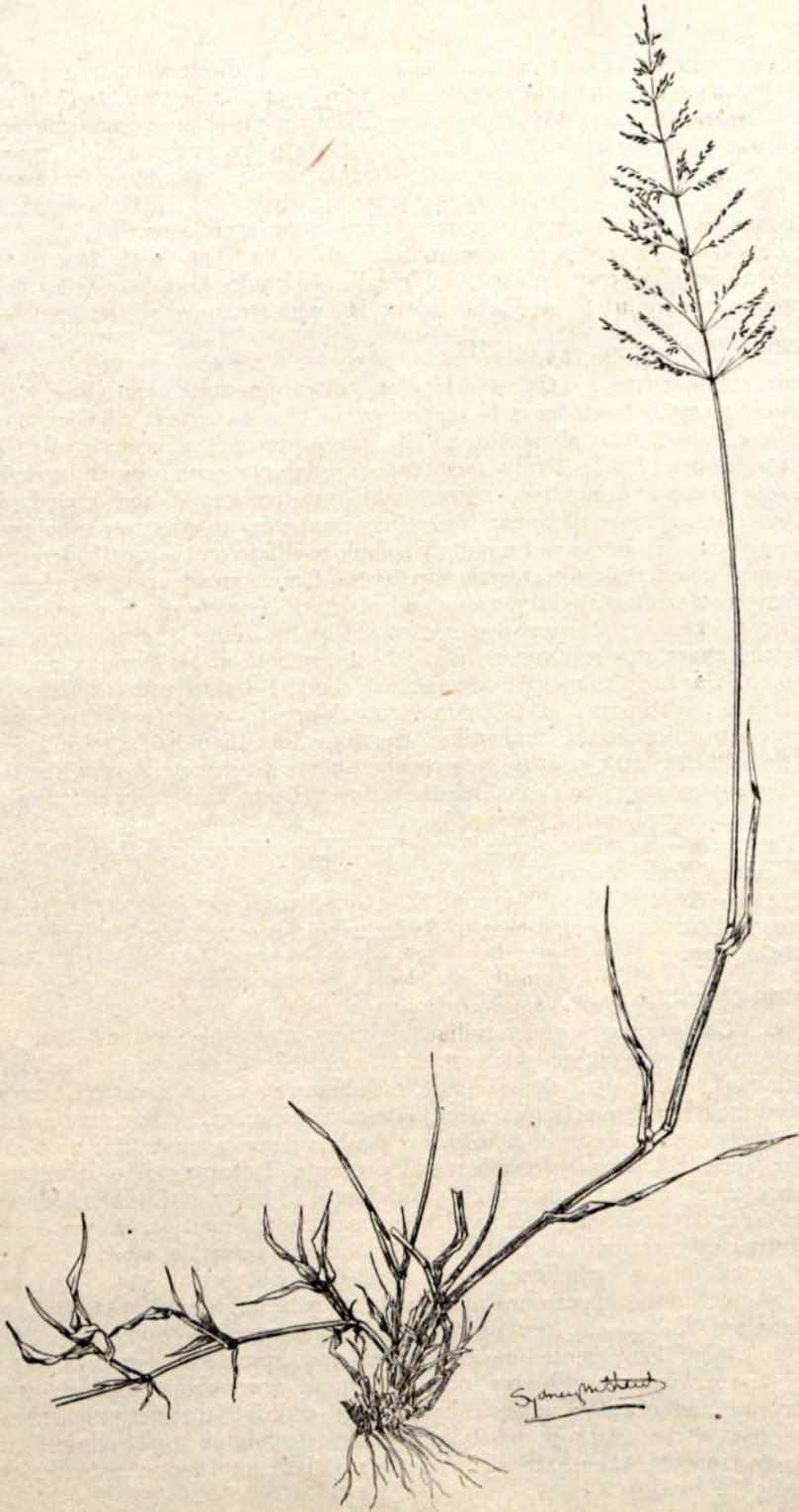


Plate III.

*Sporobolus usitatus*, Stent.

TRANSVAAL.—Pretoria Dist.: Rooikop Bushveld, *Pole Evans* 590 and 271 (in *Nat. Herb. Pret.*); Mosdene, Naboomspruit, Waterberg, *Galpin* M. 682 (in *Nat. Herb. Pret.*).

A very characteristic grass with its decumbent ascending habit and short, broad, flat leaves on leafy runners.

13. *S. centrifugus* Nees (Fl. Afr. Austr., 158).

Perennial, tufted. *Culms* slender, up to 37 cm. high, glabrous, smooth, 1-2-noded, simple; *basal sheaths* short, densely imbricating, rather thin, finely striate, persistent, upper tight, glabrous; *ligule* a narrow ciliate rim; *blades* narrow linear, flat or involute, tapering to a setaceous point, 2-3 mm. wide, 4-8 cm. long, the upper ones usually much reduced, glabrous except on the often pectinate ciliate margins. *Panicle* erect ovate, open or more or less contracted, 2.5-4 cm. wide and up to 10 cm. long; *branches* verticillate or the uppermost binate or solitary, filiform, undivided in the lower half, branchlets and pedicels very short, appressed. *Spikelets* few or rather crowded towards the tips of the branches, olive-brown with usually shining yellowish margins to the glumes, slightly over 3 mm. long; *glumes* unequal or subequal, *lower* narrow, 1-nerved, acutely or obtusely acuminate, equalling three-quarters or more of the spikelet, *upper* broader, equalling or more usually exceeding the spikelet; *valve* ovate, subacute, 1-nerved; *pale* equalling the valve truncate or broadly obtuse; *anthers* 3, 1.5 mm. long; *fruit* not seen.

CAPE PROVINCE.—Transkei: Between Gekan and Bashee, *Drège* (*Herb. Mus. Afr. Aust.*). Basutoland: Lcibe, *Dieterlen* 671 *ex parte*.

TRANSVAAL.—Near Lydenburg, *Schlechter* 3965 (*Herb. Alb. Mus. and Nat. Herb. Pret.*).

Nees quotes *Drège's* specimens from the Transkei as the type of his var. *β angusta* (Nees, Fl. Afr. Austr., 159), but the sheet in the Albany Museum Herbarium bearing *Drège's* label agrees with his description of var. *a* and not of var. *β*, and it would appear that Nees made a mistake in recording his localities. I have not seen *Drège's* plants from the Windvogel Mountain, in Cathcart Division, nor from the Witte Bergen, Aliwal North, which Nees quotes as types of his var. *a*.

14. *S. pectinatus*, Hack. (Oestr. Bot. Zeitschr., LIII, 198).

Perennial; rhizome oblique. *Culms* erect, rather slender or sub-robust, up to 40 cm. long, terete, glabrous, smooth, 2-noded, simple; *basal sheaths* densely imbricating, not exceeding 4 cm. long, usually much shorter, pallid, chartaceous, finely striate, with finely pectinate margins; upper sheaths rather tight, glabrous, green, with smooth margins; *ligule* a narrow ciliate rim; *blades* mostly crowded at the base, linear, tapering to an acute apex, flat or folded, up to 12 cm. long × 6 mm. wide, often much shorter, rigidly nerved, smooth or rarely scaberulous, pectinate ciliate on the margins with rigid tubercle based bristles. *Panicle* ovate-acute, open or somewhat contracted, up to 17 cm. long and 8 cm. broad; lowest internode about 3 cm. long, succeeding ones gradually decreasing; *branches* verticillate, filiform, smooth, obliquely ascending or more or less spreading, undivided for from two-thirds to three-quarters of their length, branchlets and pedicels very short and crowded towards the tips. *Spikelets* lanceolate, acute, about 3 mm. long, dark brownish-green; *glumes* unequal, *lower* equalling half the spikelet, ovate lanceolate, subacute, nerveless or faintly 1-nerved, *upper* equalling the spikelet, lanceolate, acute, 1-nerved; *valve* like the upper glume; *pale* oblong obtuse, 2-nerved; *anthers* 3 (rarely 2); *fruit* ovate, 1.5 mm. long, narrowed to the base, pericarp swelling in water.

CAPE PROVINCE.—George, Christina Bay, *Schlechter* 2453 (in *Alb. Mus. Herb., Herb. Mus. Austr. Afr.* 17860, and *Herb. Bol.*).

TRANSVAAL.—Pretoria: Derdepoort, *Fouche* (in *Nat. Herb. Pret.*). Witwatersrand: Doornkloof, Irene, *Pole Evans* 367 (*Nat. Herb. Pret.*); Johannesburg, *Paterson* (*Alb. Mus. Herb.*), *Rogers* 1396 (*Alb. Mus. Herb.*), *Burt-Davy* 3097 (*Nat. Herb. Pret.*), *Hutton* 253 (*Alb. Mus. Herb.*). Lydenburg, *Schlechter* 3965 (*Herb. Trans. Mus.* 19644). Carolina: Leeuwpoot, *Burt-Davy* 7736, 2990 (*Nat. Herb. Pret.*). Zoutpansberg: Downs, open veld, *Junod* 4091 (*Nat. Herb. Pret.*).

Bears a close resemblance to *S. centrifugus*, from which it differs in the broader, flat or folded rigidly pectinate leaves as well as in the shorter lower glume. Hackel places it nearest in affinity to *S. iocladus*, having obviously overlooked the much more nearly related *S. centrifugus*.

15. *S. artus*, Stent, n. sp. [Plate IV.]

Tufted perennial, rhizome oblique. *Culms* erect, slender, glabrous, smooth, striate, 1-2-noded, 26-46 cm. long; *basal sheaths* rather broad, imbricate, thin, rather firm, glabrous, finely and closely striate; *clum sheaths* narrow, tight, glabrous, smooth, finely striate, exceeding or sometimes a little shorter than the internodes; *ligule* a minutely ciliate rim; *blades* narrow linear, about 3 mm. wide at the base, tapering to an obtuse or sub-obtuse point, finely sulcate, and smooth below, smooth or finely scaberulous above, flat or involute towards the tip, margins scaberulous. *Panicle* contracted, spiciform, up to 15 cm. long; *branches* scattered or subverticillate, short, closely appressed, or the lower ones slightly spreading. *Spikelets* light olive-green, about 5 mm. long; *glumes* unequal, *lower* about two-thirds the spikelet, linear oblong, obtuse, nerveless or faintly 1-nerved, *upper* equalling the spikelet, obtuse, faintly 1-nerved, scaberulous all over on the back, sub-bicarinata in the upper half; *valve* like the upper glume; *pale* equalling the valve, faintly 2-nerved truncate when expanded, canaliculate down the back; *stamens* 3, anthers 2-3 mm. long; *lodicules* rather large for the genus, 0-5 mm. long and broad, 3-nerved; *fruit* about 1-5 mm. long, oval (only immature one seen).

NATAL PROVINCE.—Without precise locality, *Wood* 6009 (in *Natal Herb.*); Inanda, *Rehmann* 8254 (*Herb. Alb. Mus.*), *Wood* 1578 (*Herb. Alb. Mus.*); Claremont, *Schlechter* 3044 (*Herb. Alb. Mus.*); Phoenix, *Schlechter* 3128 (*Herb. Alb. Mus.*); Winkelspruit, *Wood* 11894 (*Herb. Mus. Austr. Afr.* 7391 and *Herb. Bolus*). Zululand, *Buchanan* 300 (*Herb. Bolus*). Drakensberg, near Newcastle, *Buchanan* 176 (*Herb. Bolus*).

*Rehmann* 8254 and *Wood* 1578 are quoted by Stapf in the "Flora Capensis" under *S. centrifugus* var. *angustus*.

16. *S. filifolius*, Stent, n. sp. [Plate V.]

Perennial, densely tufted, with numerous innovation shoots on an oblique rhizome. *Culms* slender, simple, smooth, glabrous, up to 40 cm. high, 1-2-noded, lower internodes short, erect, or subgeniculate; *basal sheaths* short, glabrous, firm, pale or deep straw-coloured, polished smooth, those of the culm narrow, striate, somewhat loose, glabrous except along the sometimes softly ciliate margins and at the mouth; *ligule* a narrow ciliate rim; *blades* very narrow, filiform, convolute, up to 16 cm. long, smooth or minutely scaberulous on the margins. *Panicle* narrow ovate, contracted or somewhat open, up to 9 cm. long  $\times$  2-5 cm. broad, often narrower and almost spiciform, lowest internode rather long, sometimes equalling nearly half the panicle; *branches* verticillate, filiform smooth, erect or obliquely erect, lowest up to 4-5 cm. long, undivided to about the middle, branchlets and pedicels short, erect, the latter rarely longer and equalling the spikelet. *Spikelets* from a dark greyish-yellow to olive-brown, 3-4 mm. long, acuminate; *glumes* unequal to subequal, *lower* equalling three-quarters to more of the spikelet, narrow, acutely acuminate, usually prominently 1-nerved, *upper* embracing and often exceeding the spikelet, 1-nerved, lightly bicarinata towards the tip; *valve* resembling the upper glume and usually shorter; *pale* equalling the valve truncate or emarginate at the tip; *stamens* 3, anthers 1 mm. long; *fruit* not seen.

CAPE PROVINCE.—Basutoland: Leribe, *Dieterlen* 6328 (*Herb. Mus. Austr. Afr.*). Uitenhage, stony spots on the Van Stadens River Mountains, *Ecklon* and *Zeyher* 289 (*Herb. Mus. Austr. Afr.* 12698).

NATAL.—Summit of Majuba, *Burt-Davy* 7746 (*Nat. Herb. Pret.*); Strydhoek, Mount Tintwe, *Doidge* (*Nat. Herb. Pret.* H. 19813).

Very near *S. centrifugus*, from which it differs mainly in the firm, shining basal sheaths, longer and more constantly filiform leaves, and usually narrower panicle.



Plate IV.  
*Sporobolus artus* Stent.



Plate V.  
*Sporobolus filifolius* Stent.

The comparative size of the lower glume differs on the same plant. *Dieterlen* 671 shows a form with rather long spikelets (4 mm.), but otherwise agrees with the two other specimens.

17. *S. Tysonii*, Stent, n. sp. [Plate VI.]

Perennial, densely tufted, on oblique rhizome. *Culms* slender, up to 30 cm. high, 1-2-noded, smooth and glabrous, erect or subgeniculate, simple; *basal sheaths* up to 5 cm. long, closely imbricate and persistent, firm, smooth, somewhat shining, brownish-yellow, sometimes flushed with red, glabrous except at the often ciliate margins, finely, often very faintly striate; *ligule* a minutely ciliate rim; *blades* narrow linear, flat, tapering to a setaceous convolute apex, 2-4 mm. wide and up to 11 cm. long, smooth, finely ribbed, glabrous except for the usually ciliate margins, cilia tubercle based, rather fine and rigid and about 1.5 m. long. *Panicle* narrow ovate, up to 7.5 cm. long, 2 cm. broad, branches verticillate, obliquely ascending, lowest up to 3 cm. long, undivided in the lower half, branchlets and pedicels short, more or less appressed. *Spikelets* about 4 mm. long, yellowish-brown; *glumes* unequal, lower equalling about three-quarters of the spikelet, narrow acuminate, 1-nerved, minutely scaberulous on the keel, upper broader, equalling the spikelet, 1-3-nerved, bicarinate towards the tip; *valve* resembling the lower glume; *palea* equalling the valve; *stamens* 3, anthers 2 mm. long; *fruit* not seen.

CAPE PROVINCE.—Griqualand East: On grassy slopes near Kokstad, *Tyson* 1473 (*Herb. Mus. Aust. Afr.*). Cathcart, *Sim* 2728 (*Herb. Bolus*).

Very near to *S. centrifugus* than which the panicle is rather more contracted, the basal sheaths broader and more firmly coriaceous, and the blades more constantly flat, broader and longer.

18. *S. laxivaginat*us, Stent, n. sp. [Plate VII.]

Perennial, densely tufted on a creeping rhizome. *Culms* up to 1 m. high, smooth or minutely scaberulous, 2-3-noded, simple or branched from the lower nodes; *sheaths of the leaves* loose and rather broad, the basal ones straw-coloured, becoming hard, smooth and shining, glabrous, those of the culm broader, striate hirsute or glabrescent usually equalling or exceeding the internodes; *ligule* a narrow ciliate rim; *blades* hirsute or glabrescent, scaberulous on both sides, up to 24 cm. long, those of the barren shoots very narrow and involute, those of the culms up to 10 mm. wide, minutely spinulose, ciliate on the margins. *Panicle* ovate-acuminate, up to 18 cm. long  $\times$  5 cm. wide; *branches* smooth, verticillate, obliquely ascending, undivided for from half to three-quarters of their length, branchlets and pedicels short, appressed, subsecund. *Spikelets* dark brownish-green, crowded towards the ends of the branches, 4 mm. long; *glumes* somewhat unequal, lower equalling three-quarters or more of the spikelet, narrow ovate-acuminate, slightly falcate, acute, 1-nerved, minutely scaberulous, upper broader, embracing and usually slightly exceeding the spikelet, 1-nerved, 2-keeled towards the subacute tip; *valve* 1-nerved, obtuse or subacute; *palea* equalling the valve, truncate or rounded; *anthers* 3, 1.75-2 mm. long; *fruit* ovate-obtuse, subcompressed towards the apex, 2 mm. long, pericarp rather thick, soon splitting and ejecting the seed.

NATAL: Umpumulu, on bare hills, *Buchanan* 297 (*Natal Herb.*); Van Reenen, *Wood* 7218 (*Natal Herb.* 7960); Cedara, *Fisher* 44 (*Natal Herb.* 12456); Dargle, *Lautt* (*Natal Herb.* 8584).

CAPE PROVINCE: Griqualand East: Nolangeni, *Tyson* 1327 (*Herb. Mus. Austr. Afr.* 6006); Bazeia, *Baur* 555 (*Herb. Alb. Mus.*).

TRANSVAAL: Carolina Dist.: Between Machadodorp and Carolina, *Mundy* (*Nat. Herb. Pret.* H. 4286). Ermelo Dist.: Spion Kop, *Burt-Davy* (*Nat. Herb. Pret.* H. 9236). Tzaneen Dist.: New Agatha, *McCallum* (*Nat. Herb. Pret.* H. 21682). Pretoria Dist.: Pretoria, on the Natal Road, *Pole Evans* 286 (*Nat. Herb. Pret.*)

*Buchanan* 297 from Natal and *Baur* 555 have been distributed as *S. centrifugus*, and are quoted under that species by Stapf (*Dyer Flor. Cap.* VII, 584). *S. laxevaginat*us

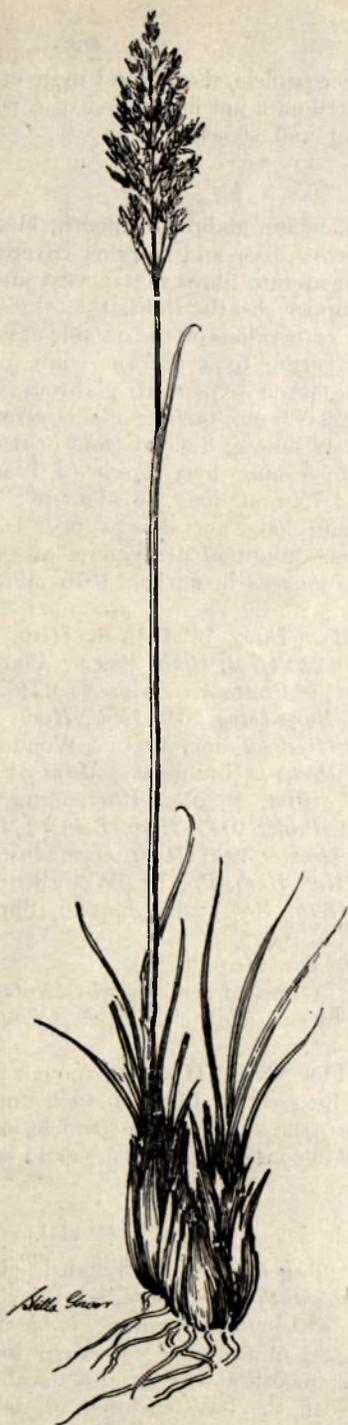


Plate VI.  
*Sporobolus Tysonii* Stent.



Plate VII.  
*Sporobolus laxeraginatatus* Stent.  
(The panicle is typically not as congested as shown in this figure, and the whorling of the branches more obvious.)

is a much coarser species than *S. centrifugus* with larger panicle, darker and more crowded spikelets, broader and looser sheaths, of which the basal ones are firmer and of a polished smoothness, while those of *S. centrifugus* are thinner and striate.

19. *S. stuppeus*, Stent. n. sp. [Plate VIII.]

Tufted perennial. *Culms* slender, erect or subgeniculate, glabrous, smooth, 11–30 cm. long, 2–3-noded; *basal sheaths* short, 1–3 cm. long, narrow, base and margins covered with tawny fugacious thin-walled curled hairs, soon splitting up into fibres that persist and form a dense matted tuft round the base of the culms; upper sheaths tight, terete, glabrous, except for a few of the same kind of hairs at the mouth, scaberulous on the outside or smooth; *ligule* a ciliate rim; *blades* very narrow, linear, tapering to a filiform point, usually, setaceous convolute, 4–6 cm. long  $\times$  1.5 mm. wide when expanded, glabrous, scabrid on the margins. *Panicle* ovate, lax, 3–7 cm. long  $\times$  2.5–5 cm. broad; rachis straight or subflexuous, smooth, glabrous; *branches* solitary, rarely binate, divided from or near the base, branchlets spreading ascending; pedicels up to 3 mm. long, branches, branchlets and pedicels delicately filiform, smooth. *Spikelets* 1.75 mm. long, oval-acute; *glumes* hyaline, acute, or acuminate; denticulate, lower 0.8 mm. long, nerveless; upper 1.3 mm., 1-nerved; *valve* 1-nerved, acute or obtuse, sometimes minutely denticulate at the tip; *pale* equalling the valve, truncate when expanded; *stamens* 3, anthers 0.75 mm. long; *Fruit* ovate, 0.5 mm. long; pericarp swelling.

TRANSVAAL.—Witwatersrand: Johannesburg, *Burt-Davy* 7496 (*Nat. Herb. Pret.*). Pretoria Dist.: Irene, *Burt-Davy* 14656; *Pole Evans* 220 (*Nat. Herb. Pret.*); Claremont, near Pretoria, *Kresfelder* (*Nat. Herb. Pret. H.* 20834); Pretoria, *Leendertz* 6286 (*Herb. Trans. Mus.*); Magaliesberg near the Wonderboom, *Burt-Davy* 2683 (*Nat. Herb. Pret.*); Magaliesberg, *Schlechter* 3595 (*Herb. Alb. Mus.*); 6364 (*Herb. Trans. Mus.*); Wonderboom, *Burt-Davy* 7184, 3343; *Pole Evans* 229 (*Nat. Herb. Pret.*); Kaalplaats, *Mogg* 340 (*Nat. Herb. Pret.*); Rietfontein, *Pole Evans* (*Nat. Herb. Pret.* 18907). Rustenburg Dist.: Rooikop, Bushveld, *Pole Evans* 256 (*Nat. Herb. Pret.*), *Pegler* 1095 (*Herb. Bolus*); Pillansberg, *Smuts* and *Pole Evans* 632; Crocodile River, *Schlechter* 3900 (*Herb. Mus. Austr. Afr., Herb. Alb. Mus.*); Maricana River, *Burt-Davy* 161 (*Nat. Herb. Pret.*). Waterberg Dist.: near Nylstroom, *Burt-Davy* 2068 and 2023 (*Nat. Herb. Pret.*); Klipfontein, Springbok Flats, *Nelson* 274 (*Herb. Trans. Mus.*).

SWAZILAND.—Black M'belusi, *Burt-Davy* 10650 (*Nat. Herb. Pret.*).

NATAL.—Dundee, *Green* 81 (*Natal Herb.* 9230); Camperdown, *Franks* (*Natal Herb.* 12613); near Maritzburg, *St. George* 25 (*Natal Herb.* 8106); Howick, *Franks* (*Natal Herb.* 14549); Umsinga, *Buchanan* 96 (*Herb. Bolus*).

This is *S. festivus* var. *steppeus*, Stapf (*Dyer. Flor. Cap.* VII, 582); though bearing a certain resemblance and affinity to *S. festivus* Hochst., yet it differs in such important characters as the size of the spikelet and the glumes, the shape of the panicle, and the character of the basal sheaths, and I agree with Hackel in considering that it should be given specific rank.

20. *S. festivus*, Hochst. var. *fibrosus* Stapf. [Cheval. Sudan, 142, 155 (1911)].

Tufted perennial. *Culms* slender, straight or sub-geniculate, 2–3-noded, glabrous, finely sulcate, smooth or minutely scaberulous; *basal sheaths* thin, loose, soon drying and splitting into fibres, culm sheaths tight, glabrous, or with ciliate margins; *ligule* a fringe of hairs; *blades* linear, narrowing to a subacute tip, 2–4 mm. broad  $\times$  2–6 cm. long, flat or involute in the upper part, glabrous, finely nerved, smooth above, minutely scaberulous on the nerves below. *Panicle* ovate, erect, often with the base enclosed in the upper sheaths, up to 15 cm. long  $\times$  5 cm. wide; rachis smooth, glabrous, finely sulcate; branches solitary, scattered, divided from the base; branches, branchlets, and pedicels finely filiform and usually flexuous, pedicels 1.5–3 mm. long. *Spikelets* 1–1.3 mm. long, oval-acute, purplish; *glumes* sub-equal, very small, hyaline; lower 0.3 mm., broadly obtuse or shortly



Plate VIII.  
*Sporobolus stueps* Stent.

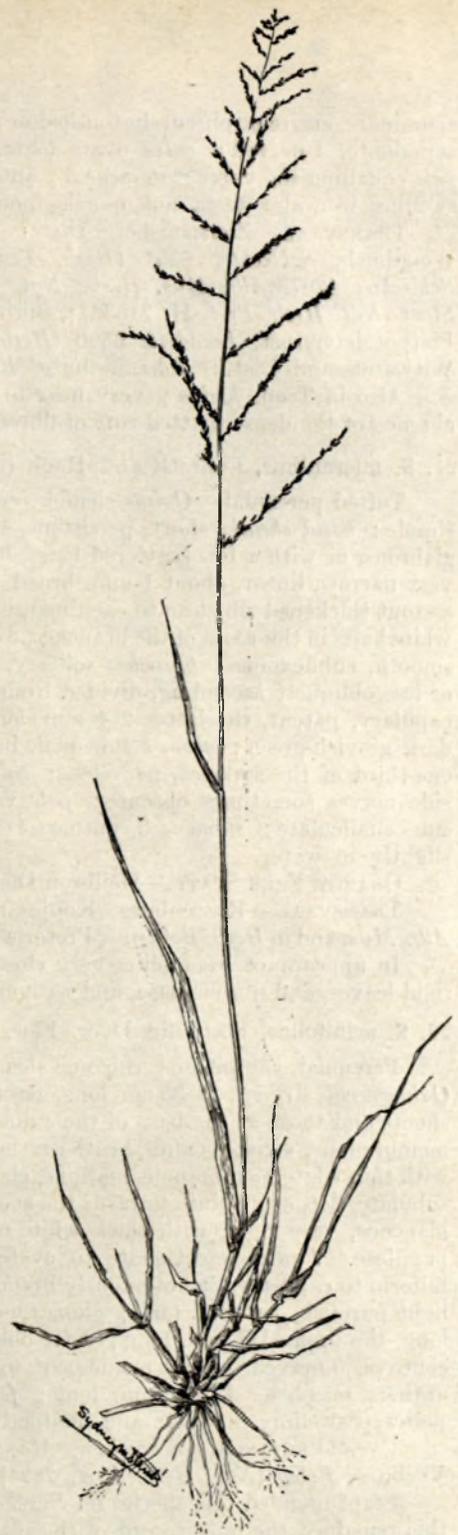


Plate IX.  
*Sporobolus Fourcadii* Stent.

acuminate, entire or obscurely toothed or fimbriate; *upper* 0.5 mm. broadly ovate, abruptly acuminate, 1-nerved; *valve* ovate-acute, 1-nerved, flushed with purple, 1.3 mm. long; *pale* equalling the valve; *stamens* 3; anthers 0.5 mm.; *fruit* ovate, 0.6 mm. long, pericarp swelling in water testa not mucilaginous.

TRANSVAAL.—Zoutpansberg Dist.: Houtbosch, *Schlechter* 4403 (*Herb. Alb. Mus.*); Woodbush, *Schlechter* 6354 (*Herb. Trans. Mus.*). Waterberg Dist.: Pienaars River, *Schlechter* 4207 (*Alb. Mus. Herb.*, *Nat. Herb. Pret.*, *Herb. Trans. Mus.*); Warmbaths, *Stent* (*Nat. Herb. Pret.* H. 21536); Springbok Flats, *Burtt-Davy* 1111 (*Nat. Herb. Pret.*); Pietpotgietersrust, *Leendertz* 6590 (*Herb. Trans. Mus.*), *Galpin* 8907 (*Nat. Herb. Pret.*). Witwatersrand Dist.: Johannesburg, *Edwards* 274 (*Herb. Alb. Mus.* and *Herb. Bolus*).

Also in Trop. Africa; very near to *Sporobolus stuppeus*, from which it differs in the absence of the dense matted tuft of fibres at the base, longer panicle, smaller spikelets, etc.

21. *S. micranthus*, Conrath and Hack (in Oest. Bot. Zeitschr. 1903, 198).

Tufted perennial. *Culms* slender, erect, up to 49 cm. long, terete, glabrous, 3-noded, simple; *basal sheaths* short, persistent, splitting into fibres; upper sheaths tight, narrow, glabrous, or with a few scattered hairs, bearded at the mouth; *ligule* a ciliate rim; *blades* very narrow, linear, about 1 mm. broad  $\times$  12 cm. long, flat or setaceously convolute, with a stout thickened rib close to each margin, scaberulous. *Panicle* ovate, open, lax, with fine white hairs in the axils of the branches, 8–15 cm. long by 4–10 cm. broad, rachis and branches smooth, subflexuous; *branches* solitary, rarely binate, spreading at right angles or more or less obliquely ascending, divided from the base, filiform; branchlets and pedicels finely capillary, patent, the latter 2–4 mm. long. *Spikelets* scattered, 1.6 mm. long, lanceolate, dark greyish-green; *glumes* subequal, broadly ovate, obtuse or subacute, equalling about one-third of the spikelet, nerveless; *valve* ovate-lanceolate, subacute, or acute, 3-nerved, side nerves sometimes obscure; *pale* very like the valve, 2-nerved, flat on the back or sub-canalicate; *stamens* 3, anthers 1.3 mm. long; *fruit* narrow oval, pericarp swelling slightly in water.

ORANGE FREE STATE.—Heilbron Dist.: Maccavlei, *Brandmuller* 36 (*Nat. Herb. Pret.*).

TRANSVAAL.—Rustenburg, Kopjes near the Crocodile River, *Schlechter* 3977 (*Herb. Alb. Mus.* and in *Herb. Bolus*). Pretoria Dist.: Rooikop, *Pole Evans* 535 (*Nat. Herb. Pret.*).

In appearance resembling very closely *S. subtilis*, but with a narrower panicle, more rigid leaves, and fibrous base, and without the characteristic produced rachilla of *S. subtilis*.

22. *S. acinifolius*, Stapf (in Dyer. Flor. Cap. VII, 581).

Perennial, caespitose; rhizome slender, branched, with numerous short barren shoots. *Culms* erect, slender, 23–35 cm. long, glabrous, smooth, 2–3-noded. Leaves of the innovation shoots and those at the base of the culms densely crowded, distichous; *lower sheaths* short, membranous, striate, culm sheaths rather shorter than the internodes, tight, striate, firm, with thin white membranous margins, glabrous; *ligule* a densely ciliate rim; *blades* cuneate, subulate, flat, or involute towards the acute callous tip, 2.5 cm. long, 3 mm. wide at the base, glaucous, very rigid, with thick white cartilaginous margins, upper surface densely white papillose. *Panicle* erect-ovate to ovate-oblong, very lax, divaricate; *branches* solitary, filiform to capillary, dichotomously branched, smooth; pedicels 2–3 mm. *Spikelets* oblong, light purplish, 1.6 mm. long; *glumes* unequal, hyaline, nerveless, obtuse, the *lower* 1 mm. long, the *upper* 1.5 mm. long; *valve* oblong, obtuse, delicate, hyaline above, firmer below, concave, 3-nerved, nerves evanescent towards the tip; *pale* slightly shorter; *stamens* 3; anthers purplish, 1–1.5 mm. long; *fruit* 1 mm. long, obliquely obovate, compressed; pericarp swelling in water and distinctly mucilaginous.

CAPE PROVINCE.—Kuruman, *Mogg* 7635 (*Herb. Vet. Res. Pret.*); Armoedsvalkte, Vryburg, *Foley* (*Nat. Herb. Pret.* 2824).

Stapf founded this species on *Burchell's* 1846 from Griqua Town, collected about 1813; this remained the only record of the plant till 1920, when it was collected by J. W. Mogg at Kuruman and later at Vryburg by M. Foley.

23. *S. robustus*, Kunth. (Rev. Gram., 11, 425, t. 126).

Perennial, tufted, or stoloniferous (?). *Culms* robust, geniculate, ascending, up to 6-noded and branched from most of the nodes, 0.7–1.3 m. long; *basal sheaths* short, ovate, acute, straw-coloured, smooth, shining and scale-like, without or with very much reduced blades; upper sheaths firm, loose, glabrous, finely striate, exceeding the internodes; *ligule* a rim of very short rigid hairs; *blades* linear, long, tapering to an apex, flat or folded, 4–6 mm. wide; up to 26 cm. long, not contracted at the base, glabrous, rigid, striate, scaberulous on the margins only, or all over, midrib white and conspicuous above, scarcely prominent beneath. *Panicle* long, narrow, elliptic, 23–42 cm. long  $\times$  1.5–5.5 cm. wide, rachis sulcate, smooth; *branches* solitary, rarely the lower subverticillate, obliquely ascending up to 11 cm. long, divided from near the base; branchlets and lateral pedicels short, appressed. *Spikelets* pale-greivish or glaucous-green, 2.5 mm. long; *glumes* equal, or subequal, the length of the spikelet, the lower sometimes slightly exceeding it, ovate, acute, 1-nerved, upper part of keel scabrid; *valve* like the glumes, but not scabrid; *pale* ovate, with rounded tip (when expanded), 2-nerved, canaliculate down the centre; *stamens* 3; anthers 1–1.5 mm. long.

TRANSVAAL.—Zoutpansberg: Messina, *Pole Evans* (in *Nat. Herb. Pret.* H. 13113.)

A coarse much-branched tropical grass, with erect narrow panicle.

24. *S. virginicus*, Kunth (Rev. Gram., 1: 67, 1829).

Perennial, rhizome, long creeping, stoloniferous, sending up flowering shoots from the nodes. *Culms* up to 38 cm. long, many-noded, sheathed to the base of the inflorescence; *sheaths* tight, glabrous, sulcate, overlapping each other, having at the mouth and sometimes on the thin margins; *ligule* a ciliate rim; *blades* up to 10 cm. long, 2–6 mm. broad, convolute towards the narrow acute tip, often pungent, firm, usually more or less flat at the base or sometimes in the broader-leaved forms flat right through, glabrous, scaberulous on the upper surface, smooth below, many and firmly nerved, margins scabrid. *Panicle* contracted and spike-like, rarely somewhat loosened, 2–9 cm. long; *branches* short, divided from or very near to the base; pedicels short. *Spikelets* greyish-green, 2–3 mm. long; *glumes* unequal, ovate acute, 1-nerved, keels acute, scaberulous above, the lower equalling half to four-fifths of the upper; the upper as long as or usually rather longer than the valve; *valve* like the upper glume, 1-nerved; *pale* truncate or obtuse, canaliculate down the centre; *stamens* 3; anthers 1.5 mm. long; *fruit* narrow ovate, slightly compressed, yellow, with delicate reddish veinings; pericarp swelling.

CAPE DIVISION.—Cape Peninsula: Buffels Bay, *Edwards* (*Nat. Herb. Pret.*); Flats below Wynberg, *Bolus* 15062 (in *Alb. Mus. Herb. and Nat. Herb. Pret.*); Miller Point, *Wolley Dod* 2288 (*Herb. Bolus*); Muizenberg Vlei, *Wolley Dod* 925 (*Herb. Bolus*); Cape Flats, *Rehmann* 1767 (*Alb. Mus. Herb.*); Green Point, *Ecklon* (*Herb. Mus. Austr. Afr.*). East London: East London, near Cove Rock, *Galpin* 7356 (*Nat. Herb. Pret., Alb. Mus. Herb.*); West of East London, *Hilner* 377 (*Alb. Mus. Herb.*). Uitenhage: North of Van Staden River, *MacOwan* 710 (*Herb. Mus. Austr. Afr., Herb. Bolus*); Redhouse, *Paterson* 498 (*Natal Herb.* 15865, *Herb. Bolus*); Uitenhage, *Ecklon and Zeyher*. (*Herb. Mus. Aust. Afr.*).

PORT ELIZABETH DIV.—Drège 649 (*Alb. Mus. Herb.*); Zwartkops River, *Ecklon* (*Alb. Mus. and Herb. Mus. Aust. Afr.*).

BATHURST DIV.—Pora River mouth near Mazeppa Bay, *Hilner* 507 (*Alb. Mus. Herb. and Nat. Herb. Pret.*); Marsh ground, Grahamstown, *Salisbury* (*Alb. Mus. Herb.*); near Port Alfred, *Burchell* 4032 (*Herb. Mus. Austr. Afr.*); sand-dunes, Port Alfred, *Tyson* (*Nat. Herb. Pret.* 12610, *Natal Herb.* 15859, *Herb. Bolus* 14882); lagoon, Port Alfred, *Galpin* 2971 (*Nat. Herb. Pret. and Alb. Mus. Herb.*); Potts 186 (*Alb. Mus. Herb.*); Britten 796, 1930 (*Alb. Mus. Herb.*); *Flanagan* 1892; 997 (*Nat. Herb. Pret., Herb. Bolus, Grey College Herb.* 4268 (*Herb. Trans. Mus.*). Natal: Verulam, *Wood* 10223 (*Natal Herb.* 11352; *Herb. Bolus*); Congella, *Wood* 11980 (*Natal Herb. and Herb. Mus. Austr. Afric.*); Bluff, Durban, *Wood* 12548 (*Natal Herb.* 14474).

The Natal plants have slightly shorter spikelets and broader and flatter leaves.

The only one of the specimens I have examined which is in fruit is Tyson's from Port Alfred, and I have described the caryopsis from that plant.

25. *S. fimbriatus*, Nees. (Fl. Afr. Aust., 156).

Perennial, densely tufted. *Culms* erect or geniculate, 2-3 ft. long, 2-4-noded, simple or branched from the lower nodes; *sheaths* glabrous, rarely with a few scattered spreading hairs, often ciliate along the margins, smooth, the lowest pallid and more or less compressed and keeled; *ligule* a ciliate rim; *blades* linear, tapering to a long setaceous point, 12-25 cm. × 2-4 mm., flat or more usually involute, with inrolled margins, glabrous or rarely the lower ones with scattered spreading hairs; primary lateral veins conspicuous, usually three on either side the inconspicuous midrib. *Panicle* erect, long and often more or less contracted, tapering to a narrow apex, 19-35 cm. long, and 3-7 cm. broad; *branches* solitary, irregularly crowded, 2-7 cm. long, filiform ascending, spreading, branched from the base, or occasionally the base bare for 1 cm.; branchlets usually very short, but in some specimens attaining a length of 2½ cm.; pedicels short. *Spikelets* greyish-green to dark olive-grey, up to 2 mm. long, usually crowded on the branchlets, more rarely somewhat lax; *glumes* unequal, the lower equalling about half the spikelet, narrow, nerveless, acute, or subacute; *upper* nearly equalling the spikelet or sometimes slightly exceeding it, acute or subacute, 1-nerved, more or less scaberulous on the back; *valve* ovate, acute, 1-nerved; *pale* canalicate from the tip down, rather broadly rounded, or emarginate at the tip when expanded; *stamens* 3; anthers 1 mm. long; *grain* slightly compressed, quadrangular, up to 1 mm. long; pericarp delicate and swelling in water.

CAPE PROVINCE.—Humansdorp Division: Humansdorp, below Zuurbron, *Fourcade* 2568 (*Nat. Herb. Pret.*). Albany Division: Carlisle Bridge, *Bowker* 1 (*Herb. Alb. Mus.*); Brakkloof, Grahamstown, *Hutton* 6 (*Herb. Alb. Mus.*); Graaff-Reinet, on stony hill, *Bolus* 555 (*Herb. Alb. Mus.*); Caledon, Sir Lowry's Pass, *Schlechter* 1169 (*Herb. Alb. Mus.*). Vryburg District: Warrenton, *Adams* 183 (*Herb. Alb. Mus.*); Kimberley, *Moran* (*Herb. Mus. Austr. Afr.*, *Herb. Bolus* 12730, *Nat. Herb. Pret.* H. 13912); western slopes of Langeberg range, *Pole Evans* 91 (*Nat. Herb. Pret.*); Riverton, *Wilman* (*Herb. Trans. Mus.* 19618), *Potgieter* (*Herb. Bolus* 1510); Armoedsvlakte, near Vryburg, *Theiler* (*Nat. Herb. Pret.* H. 30163, H. 20163, H. 20203, H. 20200, H. 20178, H. 20205, H. 20180, H. 21617). Basutoland: Leribic, *Dieterlen* 84 (*Herb. Mus. Austr. Afr.* 9468).

ORANGE FREE STATE.—Heilbron Dist.: Maccauvlei, *Brandmüller* 25 (*Nat. Herb. Pret.*); Bloemfontein, *Rehmann* 3799 (*Herb. Alb. Mus.*), *Potts* 1257 (*Herb. Bolus*). Boshoff Dist.: Smits Kraal, *Burt-Davy* 11344, 10101, 11349 (*Nat. Herb. Pret.*).

TRANSVAAL.—Bloemhof Dist.: Fourteen Streams, *Burt-Davy* 1691, 1635 (*Nat. Herb. Pret.*); Christiana, on farm Kaffraria, *Burt-Davy* 13090, 12758, 12765, 13054, 14160 (*Nat. Herb. Pret.*). Potchefstroom Dist.: near Machavie Station, *Burt-Davy* 1476 (*Nat. Herb. Pret.*). Pretoria Dist.: Derdepoort, *Fouche* (*Nat. Herb. Pret.* H. 21618); Rooikop, Bushveld, *Pole Evans* 157 (*Nat. Herb. Pret.*). Ermelo Dist.: Davel, *Burt-Davy* 1656 (*Natal Herb.*). Lydenburg Dist.: near Lydenburg, *Atherston* (*Herb. Alb. Mus.*); Roggerveld, *Rehmann* 3207 (*Herb. Alb. Mus.*).

Var. *latifolia*, Stent (*Bothalia*, I, 4, 279).

Leaves up to 12 mm. broad; culms robust, up to 1.8 m. long [= *S. Rehmanni* Hack (in part)].

TRANSVAAL.—Pretoria Dist.: Haamans Kraal, *Burt-Davy* 1086 (*Nat. Herb. Pret.*); Groenkloof, Pretoria, *Pole Evans* 395 (*Nat. Herb. Pret.*); near Irene, *Pole Evans* 131 (*Nat. Herb. Pret.*). Boschveld: farm Klippan, *Rehmann* 5373 (*Herb. Alb. Mus.*). Waterberg Dist.: Mosdene, Naboomspruit, *Galpin* M. 460 (*Nat. Herb. Pret.* H. 20497), *Galpin* M. 461 (*Nat. Herb. Pret.*).

NATAL.—Without precise locality, *Gerrard* and *McKen* 44 (*Natal Herb.*); Clairmont, *Wood* 6055 (*Natal Herb.*); Camperdown, *Franks* (*Natal Herb.* 11709, *Herb. Alb. Mus.*, *Nat. Herb. Pret.*); Durban, *Rehmann*, 8626 (*Herb. Alb. Mus.*); Tugela River, *Buchanan* 245 (*Natal Herb.*).

The type occurs freely in the dry and sandy regions of the grass and thorn veld. It is plentiful in association with *Eragrostis* spp. in parts of Bechuanaland and the High Veld.

The variety is a Bushveld form that also occurs in Natal and probably extends north into the tropical regions.

*Rehmann's* 5373, on which *Hackel* founded his species *S. Rehmann*, has hairy leaves and a narrow panicle. I have seen no other specimen quite like it.

*Stapf* (in *Dyer Flor. Cap.* VII, 585) has kept *S. Rehmanni* as a distinct species, and has amplified *Hackel's* description to include all the glabrous broad-leaved forms of the Bushveld and Natal. Critical examination of a number of specimens ranging from *S. fimbriatus*, sensu stricto, though all variations of width of leaf and panicle to the broad-leaved and robust form of the Bushveld and Natal has convinced me that this latter is only a climatic and edaphic variety of *S. fimbriatus*.

26. *S. Fourcadii*, *Stent*, n. sp. [Plate IX].

Tufted perennial, on a short creeping rhizome. *Culm*, erect or subgeniculate, 14–40 cm. high, 1-noded, terete, glabrous, smooth; *sheaths* rather tight, compressed, firm, striate; *ligule* reduced to a narrow ciliate rim; *blades* narrow, tapering to a fine acute point, flat or involute, about 4 mm. wide × 8–10 cm. long, primary lateral nerves about 3 on either side the midrib, rigid, prominent below, scarcely distinguishable on the upper surface from the fine close secondary nerves, glabrous, smooth, margins scaberulous. *Panicle* narrow, linear lanceolate, scanty; *branches* not crowded mostly solitary, flexuose, short, longest up to 4 cm. long, spreading at right angles or obliquely ascending, scabrid, divided from near the base; *branchlets* short, scabrid 2–4 spiculate, appressed to the branches. *Spikelets* subsessile or on very short pedicels, 2 mm. long, lanceolate acuminate, rather pale, greyish-green or almost straw-coloured; *glumes* unequal, lower quarter to one-third the length of the spikelet, nerveless, obtuse or truncate, minutely dentate; *upper* equalling about two-thirds the spikelet, lanceolate, acute, or sub-acute, minutely dentate, 1-nerved; *valve* sub 3-nerved, the sides inflexed towards the tip, tip minutely dentate; *pale* shorter than the valve, obtuse to subtruncate, nerveless, canaliculate; *stamens* 3 (occasionally 2); *anthers* 0.8 mm.; *fruit* oblong, 1 mm. long; *pericarp* swelling slightly in water.

CAPE PROVINCE.—*Knysna*, *Burt-Davy* 15116 (*Herb. Bolus*). Humansdorp Div.: Humansdorp, *Fourcade* 1986 (*Nat. Herb. Pret.*, *Herb. Bolus*); *George*, *Schlechter* 2224 (*Herb. Alb. Mus.* and *Herb. Bolus*). Bathurst Div.: *Kowie*, *Hutton* 45 (*Herb. Alb. Mus.*).

Distributed as *S. diandra*, *Beauv.*, an Indian species to which the South African plant bears a certain superficial resemblance, but from which it differs in the size of the glumes, the width of the leaves, the arrangement of the branches of the panicle and other points.

27. *S. pyramidalis*, *Beauv.* (*Flor. d'Oware et de Beain*, 11, 36).

Perennial, tufted. *Culms* up to 1.5 m. long and to 4-noded (usually 2–3), erect, glabrous, smooth, terete or sub-compressed at the base, sheathed all along or the upper internodes exerted; *sheaths* quite glabrous, sometimes shortly ciliate on the margins, smooth, finely striate, upper terete, lower more or less compressed, pallid; *blades* linear, tapering to a fine point, 3–8 mm. wide, 10–30 cm. long, flat or folded, minutely scaberulous, midrib slender but prominent, primary lateral nerves 4 on either side, glaucous. *Panicle* erect, narrow, lax, 18–44 cm. long, 2–5 cm. broad, tapering to the tip; *rachis* smooth, terete, finely sulcate; *branches* simple or divided with short branchlet often secund, scattered or occasionally verticillate, bearing spikelets from the base or bare for from 10–20 mm. above the base. *Spikelets* crowded, dark greyish-green, 1.7–2 mm. long; *glumes* unequal; *lower* up to 0.5 mm., broadly rounded or truncate, often denticulate, nerveless; *upper* up to 0.9 mm., subtruncate, or broadly rounded or sometimes shortly and abruptly obtusely

acuminate, 1-nerved, both thinly membranous; *valve* obtuse to subacute, scaberulous, equalling or slightly shorter than the *pale*, 1-3 nerved; *pale* usually slightly longer than the *valve*, with broadly rounded tip when flattened out; *stamens* 3; *lodicules* small, broadly truncate or emarginate; *fruit* quadrangular, ovate, remaining for some time after ripening, attached to the base of the *floret*; *pericarp* tardily swelling and bursting in water.

NATAL.—Without precise locality, *Buchanan* 243, *Gerrard* and *McKen* 45 (*Natal Herb.*); *Tembuland*, *Baur* 405 (*Herb. Mus. Austr. Afr.* 12654); *Hilton Road*, *Schlechter* 6769 (*Herb. Alb. Mus.*); *Berea*, *Durban*, *Wood* 5924 (*Natal Herb.*); *Umtwynkwa Cutting*, *Isolo*, *Galpin* 6922 (*Herb. Alb. Mus. and Nat. Herb. Pret.*); *Farkkop*, *Rehmann* 7675 (*Herb. Alb. Mus.*); *Maritzburg*, *Angus* (*Nat. Herb. Pret. H.* 13799), *St. George* (*Nat. Herb. Pret.*), *Wood* 7243 (*Herb. Bolus*); *Zululand*, *Jenkinson* 6 (*Natal Herb.* 7961); *South Coast*, *Natal*, *Pole Evans* 782 (*Nat. Herb. Pret.*); *Bremersdorp*, *Burt-Davy* 3013 (*Nat. Herb. Pret.*).

TRANSVAAL.—*Carolina Dist.*: near *Bossies*, *Burt-Davy* 2955 (*Nat. Herb. Pret.*). *Witwatersrand*: *Johannesburg*, *Bryant* B 23 (*Nat. Herb. Pret.*). *Lydenburg Dist.*: *Sterk Hill*, *Burt-Davy* 478 (*Nat. Herb. Pret.*). *Pretoria*, *Leendertz* 12790 (*Herb. Trans. Mus.*); *Wolvenkraal*, *Kameel River*, *Pole Evans* (*Nat. Herb. Pret.*). *Waterberg Dist.*: *Pietpotgietersrust*, *Galpin* 8898 (*Nat. Herb. Pret.*); *Warmbaths*, *Leendertz* 6664 (*Herb. Trans. Mus.*); *Springbok Flats*, *Burt-Davy* 1137 (*Nat. Herb. Pret.*). *Zoutpansberg*: *Spelonken*, *Junod* 115 (*Herb. Trans. Mus.* 20257). *Pretoria*: *Irene*, *Pole Evans* 376 (*Nat. Herb. Pret.*).

## 28. *S. indicus*, R. Br. (Prod. 170).

Perennial, tufted. *Culms* erect or geniculate, 1-3 ft. long, glabrous, smooth, 1-3-noded (usually 2-noded), below the panicle, terete or sub-compressed, sheathed all along or the upper internodes exserted; *leaves* mostly crowded near the base; *sheaths* glabrous, except on the often ciliate margins, finely striate, the lower ones sub-compressed; *pale* 1-2 ins. long and rather broad and membranous; *ligule* a minutely ciliate rim; *blades* linear, tapering to a fine point, 2-4 mm. wide and up to 20 cm. long, glabrous, smooth above and usually finely scaberulous below and on the margins, flat or convolute. *Panicle* narrow, spike-like above; *branches* and branchlets solitary, very short, crowded, and many spiculate, except the lower ones, which are often up to 2.5 cm. long and more distant and appressed. *Spikelets* dark greyish-green over 2 mm. and under 3 mm. long; *glumes* unequal; lower oblong, obtuse, nerveless, 0.8-1 mm. long, thinly membranous; *upper* ovate-acuminate, acute or subacute, 1-nerved, 1-1.6 cm. long, thinly membranous; *valve* 2.5 mm., 1-3-nerved, minutely scaberulous, obtuse or minutely truncate, margins reflexed towards the tip; *pale* equalling the *valve*, rounded or subtruncate; *stamens* 3; *anthers* 1 mm. long; *lodicules* 0.3 m. long, delicate, broadly truncate or emarginate; *fruit* quadrangular, oblong, *pericarp* swelling in water, very delicate.

CAPE PROVINCE.—*Knysna*: in forest, *Bolus* 2694 (*Herb. Bolus*). *Humansdorp*: *Hofmansbosch*, *Britten* 1217 (*Herb. Alb. Mus.*); *Flats Witte Els Bosch*, *Fourcade* 996 (*Herb. Alb. Mus.*); *George*, near *Montagu*, *Kensit* (*Herb. Bolus* 14730); *Montagu Pass*, *Burt-Davy* 12595 (*Nat. Herb. Pret.*). *East London*: *Slopes near Kefani River Mouth*, *Galpin* 5823 (*Nat. Herb. Pret., Herb. Alb. Mus.*). *Albany*: *Oatlands Park*, *Grahamstown*, *Daly* and *Sole* 156 (*Herb. Alb. Mus.*). *Bathurst*: *Kowie*, *Hutton* 15a (*Herb. Alb. Mus.*); *Port Alfred*, *Burt-Davy* 7888 (*Nat. Herb. Pret.*), *Tyson* (*Nat. Herb. H.* 12558, *Herb. Trans. Mus.* 17076, *Herb. Bolus* 14885). *Komgha*: near *Komgha*, *Flanagan* 1257 (*Herb. Mus. Austr. Afr., Herb. Alb. Mus.* 1910, *Herb. Bolus*). *Caledon*: *Sir Lowry's Pass*, *Schlechter* 1166 (*Herb. Alb. Mus.*); *Hermanus*, *Pole Evans* 445 (*Nat. Herb. Pret.*). *Peninsula*: *Grassy veld near Capetown*, *Zeyher* 48 (?) (*Herb. Mus. Austr. Afr.*); *Kenilworth*, *Bolus* 15049 (*Nat. Herb. Pret.*); *Rondebosch*, *Wolff Dod* 5344 (*Herb. Bolus*); *slopes of Lion's Head*, *Zeyher* 4497 (*Herb. Alb. Mus. and Herb. Mus. Austr. Afr.*); *Noord Hoek*, *Smuts*. *Uitenhage*: *Zuurberg*, *Holland* 99 (*Herb. Alb. Mus.*); near *Sanatorium*, *Schonland* 3194 (*Herb. Alb. Mus.*); *Aloes*, *Drège* (*Nat. Herb. Pret. H.* 3079).

ORANGE FREE STATE.—Brandfort, *Burt-Davy* 14703 (*Nat. Herb. Pret.*).

CAPE PROVINCE.—Western Province: Without precise locality, *Kolbe* 2632 (*Herb. Trans. Mus.*). Komgha Div.: Pasture near Komgha, *Flanagan* 910 (*Nat. Herb. Pret.*). Bathurst Div.: Kowie, *Hutton* 50 (*Herb. Alb. Mus.*); Blauwkrantz River, *Schlechter* 6867 (*Herb. Alb. Mus.* and *Herb. Bolus*); Kasuga River, *MacOwan* 1015 (*Herb. Mus. Austr. Afr.*). Albany Div.: Grahamstown, *Daly* and *Sole* 171 (*Herb. Alb. Mus.*). Uitenhage Div.: Zuurberg, *Holland* 96 (*Herb. Alb. Mus.*). Alice Div.: Lovedale, *Macdonald* 10 (*Herb. Alb. Mus.*). Kentani Div.: Veld, *Pegler* 1055 (*Nat. Herb. Pret.*, *Herb. Bolus*). Middelburg: *Hewitt* (*Herb. Trans. Mus.* 12100).

There is a divergence of opinion among botanists as to the correct classification of this grass.

Grisebach (*Fl. Brit. W.Ind.* 533) Bentham (*Fl. Austr.* VII, 622), and Stapf (*Dyer Fl. Cap.* VII, 586) refer it to *S. indicus* R.Br., which is the *Agrostis indica* of *Linnaeus*. Hitchcock and Chase ("Grasses of the West Indies," cont. *U.S. Nat. Herb.* XVIII, 370) classify it under *Vilfa berteroaana Trin* (*Sporobolus berteroaana H.C.*), reserving the name *indicus* for the longer looser panicle form. Hitchcock ("Grasses of Hawaii," *Mem. Bern. Paw, Bishop's Mus.*, VIII), also recognises *S. elongatus* R.Br. as a distinct species very near to *S. berteroaanus*, but with a narrower laxer panicle.

The South African material corresponds on the whole rather more with Hitchcock's conception of *S. elongatus* than of *S. berteroaana*, though *Bolus* 15049 from Kenilworth in the Cape Peninsula, and *Zeyher* 48 from Capetown both represent a form with the spike-like inflorescence up to 16 cm. long by 12 mm. broad. We have no record of a smut attacking this grass in South Africa.

I have for present purposes thought it advisable to adopt Stapf's classification of the grass as being the best known in this country, and as, without having access to types and with only South African material for examination, it is impossible for me to form an opinion on the subject or to throw my weight into the controversy.

28. *S. Subtilis*, Kunth (*Rev. Gram.* 11, t. 124).

Densely tufted perennial on a creeping rhizome. Culms erect, slender, glabrous, smooth, 4-5-noded, sheathed to the base of the panicle; sheaths very tight, narrow, glabrous, except at the usually bearded mouth; ligule a very short ciliate rim; blades very narrow, setaceously convolute, up to 23 cm. long  $\times$  1 mm. wide, minutely scaberulous, glabrous. Panicle oblong to almost rhomboid, lax, open, up to 15 cm. long  $\times$  12 cm. broad, dichotomously branched, all divisions capillary, with fine white hairs from the axils; pedicels up to 4 mm. long. Spikelets few, lanceolate, 1.5-1.75 mm. long; rachilla produced into a fine bristle, sometimes as long as the spikelet or much shorter; glumes subequal, 1-nerved acute; lower about 1 mm. long; upper slightly longer; valve slightly shorter than the pale, subacute, 3-nerved, side nerves obscure; pale narrow, obtuse, obscurely canaliculate; stamens 3; anthers 1 mm. long; grain oblong, about 1 mm. long, subterete, finely-striate; pericarp adnate to the seed, indistinct, embryo not quite one-fifth the length of the grain."—*Stapf*.

CAPE PROVINCE.—Florida, *Hutton* 614 (*Nat. Herb. Pret.* and *Herb. Alb. Mus.*).

TRANSVAAL.—Middelburg Dist.: Belfast, *Doidge* and *Bottomley* (*Nat. Herb. Pret.* H. 21753).

Also in tropical Africa and Madagascar.

## APPENDIX.

(Latin diagnoses of new species arranged alphabetically.)

**S. artus**, Stent, n. sp.

Gramen perenne, caespitosum, rhizoma obliquum; culmi erecti, graciles, glabri, striati, 1-2-nodi, 26-46 cm. alti; vaginae basaliae latae, imbricatae, tenue membranaceae, striatae, vaginae caulinis angustae, arctae, glabrae, leaves, tenuiter striatae; ligulae minute ciliatae; laminae anguste lineares circ. 3 mm. latae, subtus tenuiter sulcatae laeves supra laeves vel leviter scaberulae, planae vel apicem obtusum versus involutae; panicula spiciforma, ad 15 cm. longa; rami solitarii vel subverticillati, breves, arcte appressi vel inferiores paulo patentes; spiculae ad 5 mm. longae; glumae inaequales; inferior spicula triplo brevior, lineare oblonga obtusa, enervata vel leviter 1-nervata; superior spiculam aequans, obtusa, leviter 1-nervata, dorso scabro; valva glumae superior similis; palea 2-nervata, expansa truncata; antherae 3, 2-3 mm. longae; lodiculae 0-5 mm. longae, latae, 3-nervis; fructus 1-5 mm. longa, ovata (immaturum tantum visum).

**S. filifolius**, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizoma obliquum; culmi graciles, simplices, ad 40 cm. alti, vaginae basis breves, glabrae, indurescentes nitidaeque, culmorum angustae, striatae, tantum laxae; laminae angustissimae, filiforme convolutae; panicula anguste ovata, vel interdum tantum patula; rami verticillati, ramulis pedicellisque brevibus; spiculae acuminatae, 3-4 mm. longae; glumae inaequales vel subinaequales, inferior angusta, acute acuminata; superior spiculam amplectens, interdum paulo longior; valva glumae superiori similes; palea valvam aequalis, truncata vel emarginata; antherae 3.

**S. Fourcadii**, Stent.

Gramen perenne, caespitosum, rhizomate brevi, repente; culmi erecti vel subgeniculati, 14-40 cm. alti, 1-nodi, tereti; vaginae arctae, compressae, firmae, striatae; laminae anguste-lineares in apice acuto attenuatae, planae vel involutae, rigidae, glabrae, laeves, marginibus scabris; panicula anguste lineare-lanceolata, exigua; rami plerumque solitarii, breves, longissimus ad 4 cm. longi, horizontale-patentes vel oblique-ascendentes, scabri, prope basum divisi; ramuli brevi, scabri, appressi, parvis spiculatis; spiculae sessiles vel brevissime pedicellatae, pallide plumbeo-virides; glumae inaequales, inferiore  $\frac{1}{4}$ -vel  $\frac{1}{3}$  spicula aequans, enervata obtusa vel truncata, minute dentata; superiore aequans circ.  $\frac{2}{3}$  spicula, lanceolata acuta vel subacuta, minute dentata, 1-nervata; valva sub 3-nervata, apice minute dentata; palea valvam brevior, obtusa, enervata, canaliculata; stamina 3 (rare 2); antherae, 0-8 mm. longae, fructus oblonga, 1 mm. longa, pericarpium in aqua parve turgiscente.

**S. Gillii**, Stent.

Gramen perenne, rhizome obliquum, innovationis brevis, sterilis, dense confertis; culmi geniculati plus minus compressi; foliorum vaginae compressae vel subcompressae, infimae breves, pallidae, tenuite membranaceae; laminae planae, glabrae, glaucae, in apicem minute obtusum attenuatae; panicula ovato-lanceolata, acuta, ramis verticillatis, patentis vel infimis oblique ascendentis; ramuli breves, appressi vel patenti, 3-spiculati; spiculae brevissimae, plumbeo-viridae, post anthesis obtusae, hiantesque, pedicellis brevissimis vel deficientis; glumae inaequales; infra bravissima, hyalina enervata; supra valvam aequans vel paulo breviora, uni-nervata, obtusa; valva glumae superae similis, uni-nervata, late obtusa; palea lata, emarginata, in medio laxe plicate; antherae 3.

**S. laxivaginatus**, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizomate repente; culmi ad 1 m. alti, 2-3-nodi; foliorum vaginae laxae, latae, basis flavae indurescentes, nitidaeque, culmorum, striatae, hirsutae vel glabrescentes; innovationum laminae angustissimae involutae, ad 24 cm. longae, culmorum latiorae, ad 10 mm. latae, 18 cm. longae, marginibus minute spinulose ciliatis; panicula ovato-acuminata ad 18 cm. longa, 5 cm. lata; ramis verticillati, obliquo-ascendentes, partis inferioribus nudis, superioribus spiciformis spiculis confertis; spicula, atraolivaceae, 4 mm. longae; glumae paulo inaequales, inferiore anguste ovato-acuminatae acuta, superiore lata, spiculam complectentes paulo-longiore; valva 1-nervata, apicem versus bicarinata; palea valvam aequans, caryopsis ovato-obtusa, apicem versus subcompressa; pericarpium mox findenta.

**S. parvulus**, Stent.

Gramen annum; culmi ad 6 cm. alti, ascendentes, graciles, 1-nodes; vaginae infimae laxae, ad 5 mm. longae, tenuiter-membranaceae, sulcatae, glabrae, margines setis basi tuberculatis ciliati; laminae ovato-lanceolatae, planae vel complicatae, ad 12 mm. longae, 2-5 mm. latae, base rotundata nonnihil amplexicaula, glabrae, tenuiter sulcatae, supra scaberulae, subtus laeves, margines cartilagineos, minute spinulosi; panicula 16-22 mm. longa, 10-16 mm. lata, rami infimi verticillati, superiores verticillati, binati, vel solitarii, demidium inferiore indivisum; ramuli breves, appressi, plerumque bi-spiculati; spiculae 1 mm. longae; glumae inaequalissimae, inferior parvissima, hyalina, ovato-obtusa, enervata; superior ovato-lanceolata, subacuta, spiculam aequans, 1-nervata; valva glumam superiorem similans, 1-nervata; palea biloba, apice dentata, mox findente; antherae 0-4 mm. longae, ovatae; caryopsis, 0-7 mm. longa; pericarpium in aqua turgescente.

**S. stuppeus**, Stent, n. sp.

Gramen perenne, caespitosum; culmi graciles, 11-30 cm. alti, 2-3-nodes; vaginae infimae breves, angustae, in fibras persistentes mox findentes, bases marginibusque pilis fulvis cincinnis tectibus; laminae angustissimae, lineares, setaceo-convolutae; panicula ovata, laxa; rami solitarii, raro binati, a basi ramuliferi; ramuli patente-ascendentes; spiculae 1-75 mm. longae; glumae hyalinae, acuta vel acuminatae, denticulatae; inferiore 0-8 mm. longa, enervata, superiore 1-3 mm. longa, 1-nervata; valva 1-nervata, acuta vel obtusa; palea truncata, expansa, valvam aequans; antherae 3, 0-75 mm. longa; fructus ovata, 0-5 mm. longa.

**S. Tysonii**, Stent, n. sp.

Gramen perenne, dense caespitosum, rhizoma obliquum; culmi graciles, ad 30 cm. alti, vaginae basis indurescentes, dense imbricatae, tenuiter striatae; laminae anguste lineares, planae, apicem versus setaceo convolutae, marginibus ciliatis; panicula anguste ovata; rami oblique ascendentes, verticillati, a medio denseflori, spiculae ad 4 mm. longae; glumae inaequales, inferior anguste acuminata, valvam circiter  $\frac{1}{3}$  brevior; superior laevior, valvam aequans; valva glumae superiori similis; palea valvam aequalis; antherae 3, 2 mm. longae.

**S. usitatus**, Stent, n. sp.

Gramen perenne, rhizoma stolonifera; culmi geniculati, saepe prostrato-ascendentes, 30-45 cm. longi, glabri, laeves teretes, vel basis subcompressis, plurinodi, inferiores breves; vaginae basis tenuiter membranaceae, glabrae, striatae, mox, marcescentes, superiores firmiores, arctae, glabrae tenuiter striatae; ligulae ciliatae; laminae lineares, in apice angusto sub-obtuso complicato attenuatae, viridae, glabrae, subtus apicem versus

marginesque scabrae, 4 mm. latae, ad 8 cm. longae; panicula ovato-acuminata, ad 9 cm. longa, 4-5 cm. lata; rami verticillati, vel interdum superiores solitarii, dimidium ad tertiae inferior indivisi; ramuli brevi 1-4 spiculis; spiculae secundae vel subsecundae 2 mm. longae plumbo-viridae; pedicelli brevis, appressi; glumae inaequales, inferior angusto-ovata, obtusa, enervata, spiculae sub-duplo brevior; superior spiculam aequans, acuta; valva glumae superiores similis; palea tenue, mox findata; antherae purpurascens, 1.2 mm. longae; fructus (?).

**S. vryburgensis**, Stent, n. sp.

Gramen perenne caespitosum; culmi erecti vel-geniculati ad 60 cm. longi, graciles, glabri, laeves, simplices vel saepe ramosae nodis inferioribus; vaginae basales ad 4 cm. longae, angustae, chartaceae, subcompressae, pallidae, leviter sulcatae, laeves, glabrae; ligulae ciliatae; laminae anguste lineares, 2-3 mm. latae, 10 cm. longae, planae vel complicatae, subtus laeves, supra pappilis minutis albidis obtusis tectae; costa subtus albida, 2 nervis primarius lateralibus utrimque onustae; panicula ovato-acuminata, ad 13 cm. longa, 6 cm. lata; rami infimi verticillati ceteri subverticillati vel solitarii, patentes; ramuli brevissimi, appressi plus minusve secundi; spiculae ad 2 mm. longae, pedicellis brevissimis vel 0; glumae inaequales; inferiore hyalina acute vel subacuta, spiculae dimidio brevior; superiore spiculam equante, obtusa vel subobtusa, 1-nervata; valva glumam superiorem aequans, obtusa vel minute emarginata, 1-nervata, carina scabrida; palea biloba, 2-nerva; antherae 3, 1.2 mm. longae; caryopsis ovata, compressa 1 mm. longa.

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## SOUTH AFRICAN SPECIES OF CYNODON.

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### INTRODUCTION.

#### Nomenclature.

There are two names in use in present-day botanical literature for the genus under revision, *Capriola* and *Cynodon*, most of the important American botanists upholding the former and most of the European botanists the latter.

The case stands as follows:—

In 1763 Adanson published in his "Famille des Plantes" a description of a grass which he called *Capriola*, a name used by the earliest botanical writers, and applied to some grass or group of grasses with digitate inflorescence, but the references to which are too vague to admit of the name being attached to any one particular plant. Adanson was the first botanist to apply this name definitely to one grass, which he describes thus: "Couronne de la gaine des feuilles: poils; fleurs: epis digités; calice: plat par les côtés; corolle: sans arete"; and in the synonymy under *Capriola* is given "Gramen dactylon off."

In 1805, in Persoon's "Synopsis Plantarum," appeared a diagnosis of a grass under the name of *Cynodon* (a Greek rendering of the name "chientend," by which it was popularly supposed to have been known in earlier botanical literature and under which it is still known in Europe). There could be no doubt as to the identity of the plant referred to, and the name was adopted by subsequent botanists and became firmly established for this small but important genus.

In 1891 Kuntz, in "Rev. Gen. Plant.," II, p. 764, revived Adanson's name, giving his reasons for so doing and pointing out that Adanson undoubtedly had this same grass in mind when he described his genus *Capriola*.

Mr. Theo. Holm opposed this theory in an article entitled "*Cynodon* or *Capriola*," published in *Botanical Gazette* of 1898, p. 47. The greater part of the article is taken up with an attempt to prove that the name *Capriola*, though much in use in botanical records of the earliest times before Adanson, could scarcely be taken to refer to one particular species,

but rather to a group of superficially alike grasses of which *Panicum sanguinale* (*Digitaria sanguinale*) was the most distinctive. His arguments make interesting reading, but are not relevant to the discussion, the point of which is whether the grass described by Adanson under the name *Capriola* is the same as that described later in Pers. "Syn. Pl." as *Cynodon*. Holm touches on this point in his last paragraph and attempts to prove that this is not the case. He holds that Adanson's description—ligule composed of hairs, flowers in digitate spikes, calyx (glumes) laterally compressed, corolla (valve) awnless—can just as easily be applied to *Panicum sanguinale*.

As Kuntz, in a later volume of his work ("Rev. Gen. Pl.," III, p. 345), points out, Mr. Holm has omitted all reference to Adanson's index where, in the synonymy of *Capriola*, is given "Gramen dactylon off." Adanson's descriptions are somewhat vague, but this phrase is practically a quotation from the first edition of Linnaeus Species Plantarum where it appears under *Panicum dactylon*. It is, therefore, obvious that this phrase, together with the diagnosis (quoted above), was intended by Adanson to refer solely to *Panicum dactylon* L., which is synonymous with *Cynodon dactylon*, Pers.

It would certainly have been more to the point had Adanson expressly mentioned the former name in his synonymy of *Capriola*, but though his methods were complicated and unsatisfactory, his intentions, at any rate in this instance, were clear.

I would also add that, apart from his sins of omission referred to by Kuntz, Mr. Holm, in upholding his argument, has made statements with which I cannot agree, namely, that *Panicum sanguinale* (= *Digitaria sanguinalis*) can be described as having a "ligule composed of hairs . . . calyx laterally compressed." I have never yet seen this *Digitaria* with laterally compressed glumes nor with a ciliate ligule. Mr. Holm also makes the statement in another part of his article that *Cynodon dactylon* never has more than five spikes to the inflorescence, whereas it has as many as seven or eight. Consideration of these facts and arguments leaves no doubt in my mind that Kuntz is right, and that the *Capriola* of Adanson is synonymous with the *Cynodon* of Persoon's synopsis, and that therefore the earlier name has the claim of priority.

The question, however, arises as to the advisability of replacing a name in use for over one hundred years by one recently revived and known to only a few scientists, merely on the plea of priority. *Cynodon* is a well-established name for a cosmopolitan genus of economic value, and under these circumstances I should be very averse to changing it; fortunately, we have the best authority for not doing so, since the name *Cynodon* appears on the list of "Nomina Conservenda" published by the Geneva Conference.

Having decided to accept the name *Cynodon* for this genus, the next controversial point is the authorship of the name. Hitchcock, Beal, Kuntz, Nees, Steudel, Torre, and Harms, etc., attribute it to Richard; while Persoon is credited with it by Bentham, Hooker, Stapf, Hackel, Kunth, etc.

Bentham gives reasons for his attitude in the matter in *Journ. Linn.*, XIX. He says: "We know that he (Richard) declined to attach his name to Persoon's 'Synopsis' chiefly from an unwillingness to sanction the arrangement under the Linnean System, and we are by no means assured that there may not have been other details in both works which he did not concur in. We are, therefore, not justified in fixing on him a responsibility which he refused to undertake; the genera and species first published by Persoon should be quoted as his and not Richard's except where Richard's name is expressly attached to them." Bentham's reasoning seems to me very sound. If the name and description of a genus is published in a certain author's work without any author's name attached to it, one must certainly assume that the author of the whole work is the author of that particular generic name, in spite of any unofficial knowledge one may have to the contrary. But as Persoon has "expressly attached" Richard's name to the diagnosis of the genus *Cynodon*, I cannot follow Bentham's logic in attributing the authorship to Persoon, when in accordance with the above reasoning Richard should certainly be held responsible for it. I have, therefore, in this work quoted Richard as the author.

### Affinities.

*Cynodon* is placed in the tribe Chlorideae, in which the spikelets are usually sessile, or sub-sessile, and secund in solitary, sub-digitate, digitate, or racemosely arranged spikes or racemes, rarely are they pedicelled and paniced; glumes more or less laterally compressed and keeled; valves 3-nerved (rarely 1-5-nerved), lateral nerves usually distant and sub-marginal, awn, when present, straight from the truncate or notched tip.

*Cynodon* is nearest in affinity to *Microchloa*, from which it differs chiefly in the size and texture of the valve as compared with the glumes and in the usually long hairs of the former; the production of the rachilla is as variable a quantity in *Microchloa* as it is in *Cynodon*, but in at least one species of the former a second usually well-developed floret is *always* present, while in the latter genus this is not the case—though I have found *occasional* spikelets in *C. dactylon*, where the rachilla terminates in a second well-developed floret, and many where it bears a more or less reduced floret or valve. The valve of *Cynodon* is sometimes minutely pubescent, but never long hairy on the nerves as it is in *Microchloa*. I have, however, seen a form of *C. dactylon* from Rhodesia that has a line of fine appressed silky hairs along each marginal nerve of the valve.

Bentham divides the two genera on the habit and on the form of inflorescence, and describes three species of *Cynodon* from Australia besides the cosmopolitan *C. dactylon*. I have not seen specimens of these species, but from the description it is obvious that they belong properly to *Microchloa* and should be placed in that genus.

### Taxonomic and Geographical Notes on the Species,

*Cynodon plectostachyum*, Pilg. Star grass. A very distinct species introduced into the Union from East Africa, distinguished from other species by the elongation of the rachis, the pubescent spikelets, the rather broad flaccid leaves, and the anatomy of the leaf blade, which differs from that of all other African species (known to me) in the enlargement of the mid rib; this consists of a large primary bundle and two secondaries; the adaxial area is composed of a mass of large irregular parenchymatous tissue devoid of chlorophyll and a small group of hypodermal fibres; the abaxial half contains chlorophyll tissue as well as the small group of fibres. The group of one large, flanked by two or three smaller thin-walled motor-cells in each groove on the adaxial side is characteristic of the genus, but the band on the opposite side I have only seen in this species. Fig. 1.

*Cynodon dactylon*, Pers. A cosmopolitan species fairly constant in its essential characters, but varying in height, texture, breadth of leaf, etc., according to locality and conditions under which it is grown.

*Cynodon incompletus*, Nees, was described by Nees from specimens collected by Ecklon and Zeyher and Drège in the coastal districts of the Cape Province, and appears to be, so far as our records go (I have not seen any of the material from the Bolus Herbarium), confined more or less to those regions.

*C. notatus*, Nees, I have not seen; except for the comparative size of the glumes and the valve, Nees's description agrees with our species *C. hirsutus*, but the distribution is so different that without seeing Nees's type I cannot suggest that this inland and, more or less, tropical species corresponds with his *C. notatus*.

*Cynodon hirsutus*, Stent, is found all over the Transvaal, and occurs also in Southern Rhodesia. We have no records of it from Natal or from any of the coastal regions.

For many years this tropical and sub-tropical grass has been identified as *C. incompletus*, Nees and has been distributed as such by the South African herbaria. Comparison, however, with the coastal species and with Nees's co-type has revealed the fact that the two grasses are quite as distinct in character as they are in distribution. I have not seen Drège's specimen from Little Namaqualand, nor Atherston from near Lydenburg, quoted by Stapf under *C. incompletus* in the "Fl. Cap.," VII, 635, but I suspect them of being referable to *C. hirsutus*.

*Cynodon transvaalensis*, Burt-Davy. "Germiston grass" and what is known to horticulturalists as "Bradley grass" are both, in my opinion, natural hybrids between *dactylon* and *hirsutus*, as is possibly also *C. Polevansii*. I have not discovered mature seed in any of the plants of these grasses that I have examined.

I have tried to raise plants from seed of *C. dactylon* and *C. hirsutus* taken from specimens growing in close proximity to each other and to Germiston or Bradley, but so far have failed to do so, and apparently the two latter are always sterile. I hope, however, to carry my investigations into this question further and prove what I now only put forward as an hypothesis, based on examinations of the morphological (both external and internal) characters of the five grasses and on observations in the field.

The following is a comparative analysis of the important specific characters of the two species, *dactylon* and *hirsutus*, and of their supposed progeny:—

*C. dactylon*.

1. Inflorescence of 3-8, mostly 4-5 spikes.
2. The production of the rhachilla beyond the floret.
3. The reduction of the ligule to a ciliate rim.
4. Wingless keel to the valve.
5. Leaves bright green, glabrous.
6. Internal anatomy of leaf: Band of irregular colourless cells penetrating the leaf from the motor-cells of the upper epidermis almost or quite to the lower epidermis; epidermal cells rather regular and not papillate. Fig. 2.

*C. hirsutus*.

1. Inflorescence of 4-5 spikes.
2. Rhachilla never produced beyond the floret.
3. Ligule distinctly membranous and up to 1.3 mm. long.
4. Keel of valve always narrowly winged.
5. Leaves rather glaucous and hairy.
6. Internal anatomy of leaf: Large motor cells of the upper epidermis separated from lower epidermis by chlorophyll tissue: epidermal cells irregular and papillate, with occasional groups of outstanding oblong cells (forming tubercles) and 1-celled hairs. Fig. 2.

*C. transvaalensis*.

1. Inflorescence of 2-3, usually 2 spikes.
2. Rhachilla produced in some of the spikelets, but not in all.
3. Ligule usually shortly membranous, but often found as a ciliate rim.
4. Keel of the valve always wingless.
5. Leaves bright green, often hairy.
6. Anatomy of leaf: No band of large irregular colourless cells between the motor-cells and lower epidermis (this character was constant in all sections examined); epidermal cells rather regular, not or scarcely papillate. Fig. 3.

*C. Bradleyi*.

1. Inflorescence of 3-4, usually 3 spikes.
2. Rhachilla produced in some spikelets of the inflorescence and not in others.
3. Ligule membranous, occasionally reduced to a ciliate rim.
4. Wingless keel to the valve.
5. Leaves hairy and glaucous green.
6. Internal anatomy: No band of irregular colourless cells between the motor-cells and lower epidermis in some sections examined, but other sections exhibited this character; epidermal cells irregular and papillate, often with groups of outstanding oblong cells from which spring unicellular hairs. Fig. 4.

*C. Plevansii.*

1. Inflorescence usually of 2 spikes.
2. Rhachilla rarely produced.
3. Ligule reduced to a ciliate rim (always?).
4. Wingless keel to the valve.
5. Leaves glabrous, pallid, rigid.
6. Internal anatomy: Row of irregular colourless cells between motor-cells and lower epidermis; epidermal cells very irregular and densely papillate, no outgrowths. Fig. 5.

It will be seen by comparison of these analyses that the three grasses, *C. Bradleyi*, *C. transvaalensis*, and *C. Plevansii*, combine in a greater or less degree the specific characters of both *dactylon* and *hirsutus*, even to the internal anatomy of the leaf structure. I have examined numbers of specimens of *Bradleyi* and *transvaalensis* from various localities, and find that the degree in which the different characters are present in each hybrid varies considerably; that is to say, in some specimens one will find, perhaps, one spikelet only of the inflorescence without the produced rhachilla, while in other specimens up to about 50 per cent of the spikelets will be without it, and so with the other transmitted characters; it will also be noticed that one important character of *C. hirsutus*, the winged keel, is not reproduced in any of the hybrids.

*C. transvaalensis*, however, is always distinguished by the very fine narrow glabrous or sparsely hairy leaves and slender runners, by its bright rather yellow-green colour, and by the very slender short culms and usually 2-3-stachys inflorescence, and it is, on the whole, more constant in character than the following.

*C. Bradleyi* has leaves at least twice as broad as the preceding, always softly hairy, and of a bluish green colour; the runners are slender and usually reddish in colour, and the inflorescence is seldom (never?) less than 3-stachys, and the membranous ligule is a fairly constant character. It will thus be seen that *transvaalensis* leans more towards *C. dactylon* and *Bradleyi* to *C. hirsutus*.

The sterility of these hybrids would account for the fact that it is possible to procure and keep a pure stand of either.

Both *dactylon* and *hirsutus* are fairly prolific seeders, and are nearly always found growing more or less together. When this is the case, one or both of the hybrids will be found in close proximity to them.

The fact that the two hybrids, Bradley and Germiston, are so distinct from each other, though each exhibits in different degrees the characters of both parents, is possibly due to reverse crosses.

Of the third suggested hybrid, which I have called *Plevansii*, I have little information. I have only seen one collection; the rigid pallid and densely papillose leaves are, as far as I know, characters foreign to both *dactylon* and *hirsutus*. The habitat of *Plevansii* is the dry sandy region of the Lichtenburg District, where, Dr. Pole Evans informs me, there was a distinct and fair-sized patch which he noticed at once as being different from the surrounding quick grasses. It appears to be more tufted in habit than *dactylon*; in its usually distachys inflorescence and short slender 1-noded culms it resembles *transvaalensis*, but the spikelets are considerably longer than in that species and more laxly arranged; the leaves, too, are broader and more rigid and pallid; comparison of the leaf sections of the two will show that *Plevansii* has rather broad bands of sclerenchyma above and below each vascular bundle and on the margin, and a very papillate epidermis; also the large thin-walled colourless cells continue downwards from the sinus of the upper surface to the lower epidermis—all of which characters are lacking in *transvaalensis*. Fig. 5.

I have no records of *dactylon* or *hirsutus* from Lichtenburg, though it is probable that both occur there. It is possible that *Plevansii* is not a hybrid, but the result of a mutation that, being specially suited to its environment and climate, has survived in the struggle for existence.

In the only material I have examined there were no ripe seeds, but the ovaries appeared to be well developed.

Though of these three grasses two are not, and one a doubtful, true species, I have conferred on them specific rank for convenience sake, because, in the case of *transvaalensis* and *Bradleyi*, they are being cultivated largely, and not bearing mature seed and being propagated vegetatively they will practically always come true to type, and it is necessary that they should have names by which they may be known to science. The same reasons apply to the case of *Polevansii*, except that it is not likely to be brought into cultivation and will have to fight for its right to perpetuate its kind under normal conditions and may lose in the fight; it is, however, well adapted to its environment and may win through and spread and become a firmly established true species or hybrid.

### Economic Value,

#### Medicinal.

The roots of *Cynodon dactylon* are well known as containing medicinal properties, and it is probable that this grass was one of the healing herbs referred to as "gramen dactylon" in ancient herbals. In southern Europe at the present day the roots of *C. dactylon* are often used as a substitute for, or as an adulterant of, those of *Agropyrum repens*, known in pharmacy as "radix graminis."

Fluckiger and Hanbury ("Pharm.," 1879, 2nd ed., p. 730), in comparing the microscopical structure of the rhizomes of the two grasses, state that those of *C. dactylon*, which affords the "gros chiendent" or "chiendent pied-de-poule" of the French, contain a greater number of much stronger fibro-vascular bundles and a cellular tissue loaded with starch, this latter substance being entirely lacking in the tissue of *Agropyrum repens*.

The indigenous African species, *C. hirsutus*, is, according to a correspondent, used by some of the Dutch population in much the same way as *C. dactylon*—a decoction is made from the roots and drunk as a blood purifier and as a cure for indigestion.

#### Agricultural.

*Cynodon dactylon* as a pasture grass has a certain value. F. von Muller ("Sel. Ex. Trop. Pl.") writes: "Difficult to eradicate, but for permanent pastures on exhausted land in mild climes not surpassed." In parts of India and in the Southern States of America it is much valued as a pasture and hay grass, especially for horses. In South Africa it seldom attains any height, and is not much valued except occasionally on poor land that will sustain no better growth. It is more generally regarded as a rather troublesome weed that soon takes possession of poor or waste land and overgrazed veld, and is difficult to eradicate.

*Cynodon plectostachyum*, "Star grass."—A tropical grass introduced into the Union from East Africa, where it is said to be an excellent pasture grass of superlative feeding value. It does well in some parts of the Transvaal, and makes first-class hay, but will stand neither drought nor frost.

*Cynodon hirsutus*, red quick, is said to be one of the most useful pasture grasses of the high veld, "affording a short but sweet bite to stock, especially mules, horses, and sheep" (Burt-Davy).

#### Ornamental.

The most important function of the grasses of this genus is for the making of lawns. *C. dactylon* is known as a lawn grass in most of the warm countries where it occurs; it makes a smooth, compact, but rather coarse lawn, and withstands drought well, but succumbs to frost, soon, however, putting on new growth in the spring. We have no records of lawns of this grass being seriously attacked by either fungus or insect pest. *C. transvaalensis*, Burt-Davy, "Florida grass," "Germiston grass," is the most popular lawn grass of South Africa; it makes a fine level springy turf, suitable for bowling or golf putting greens and for croquet lawns; the colour is a vivid rather yellow green, and it is not subject to insect or

fungous pests; with a certain amount of moisture Germiston grass will keep green throughout the hottest summer, but not through our frosty, dry winter; in fact, we have not yet found a lawn grass that will keep green the whole year round under normal conditions.

*C. Bradleyi*, "Bradley grass," has become popular of recent years as a grass for ornamental lawns, but its popularity is on the wane. It is in colour of a much bluer green than Germiston, makes an equally soft fine lawn, but is not quite so hardy, and is subject to the attacks of a nematode that in time will destroy a whole lawn.

#### DESCRIPTION OF GENUS AND SPECIES.

**Cynodon**, Rich. in Pers. "Syn. Pl.," 1, 85.

*Spikelets* laterally compressed, sessile, biseriate, and unilateral on a flattened, and more or less keeled rhachis, usually articulate between the glumes, 1-flowered, with rhachilla produced or not (occasional second floret developed in *C. dactylon*); *glumes* shorter than the valve, keeled, 1-3-nerved, the lower usually persistent; *valve* exceeding the glumes, boat-shaped, with ciliate and sometimes winged keel, 3-nerved, lateral nerves close to the margin, entirely firmly membranous or with hyaline tips and margins, mucous, or with very minute blunt muc.o; *pale* equalling or slightly shorter than the valve, 2-keeled, usually with a firmly membranous back and hyaline margins; *lodicules* 2, minute; *stamens* 3; *style* distinct; *stigmas* plumose, laterally exerted; *grain* oblong, glabrous, smooth, not sulcate, free and included in the pale and valve.

Creeping or stoloniferous perennials; *leaves* usually flat, flaccid, or rather firm; *prophyllum* entire (not bifid, as stated by Hackel); *inflorescence* of 1-12 digitate, sub-digitate, whorled or scattered narrow spikes; *spikelets* small, more or less imbricating and appressed to the rhachis.

Species, seven in South Africa, one cosmopolitan, and two also found in tropical Africa.

#### KEY TO THE SPECIES.

Keel of valve not winged

Rachilla not produced or rarely so in 3 and 5.

Valves minutely pubescent; spikes many, whorled or scattered on a short common axis..... 1. *plectostachyum*

Valves glabrous (except for dorsal cilia); spikes umbelled.

Spikes in pairs, rarely in threes; leaves rather rigid and pallid, glabrous..... 3. *Polevansii*.

Spikes 3-4, usually 3; leaves somewhat glaucous, flat, flaccid, hairy..... 5. *Bradleyi*.

Rhachilla produced, rarely not or only microscopically produced in some of the spikelets of 4 and 5.

Culms many-noded, up to 30 cm. high; spikes 3-7 digitate or sub-digitate, 3-5.5 cm. long; a rather coarse creeping grass..... 2. *dactylon*.

Culms slender, 2-3-noded, up to 10 cm. high; fine lawn grasses.

Spikes 1-3, usually 2; leaf-blades about 1 mm. wide, of a vivid green..... 4. *transvaalensis*.

Spikes 3-4, usually 3; leaf-blades up to 2 mm. wide, of a deep rather glaucous green..... 5. *Bradleyi*.

Keel of valve winged; rhachilla not produced.

Spikelets rather broadly oval, not more than 2 mm. long.

Upper glume equalling three-quarters or more of the spikelet, usually 3-nerved; leaves densely hairy..... 6. *hirsutus*.

Upper glume shorter; leaves less densely hairy..... var. *parviglumis*.

Spikelets narrow oval, up to 3 mm. long; upper glumes much shorter; lower often minute; leaves glabrous or sparsely hairy..... 7. *incompletus*.

1. *C. plectostachyum*, Pilg.

Perennial, tufted, with prostrate running stems. *Flowering culms* up to about 50 cm. high, slender, simple or branched, terete, compressible, glabrous, smooth, striate, 2 to many-noded, internodes included or shortly exserted; *leaf sheaths* finely striate, sparsely tubercular, and hairy, more densely so towards the margins; *ligule* membranous, up to over 4 mm. long; *blades* linear, tapering to a fine setaceous point, flaccid, flat, 3-6 mm. wide by about 18 cm. long, finely tubercular hairy on both sides, mid-rib fine and prominent, keeled in the lower part of the blade with 3 primary and 16-18 secondary veins on either side; *spikes* 5-12, whorled, binate, or scattered, on an elongated axis, often with one spike some distance below the first whorl; *rhachis* narrow, keeled, scabrid, minutely spinulously ciliolate along the margins, bearing spikelets from the base; *spikelets* 2.5 mm. long; *glumes* very small, with coarsely scabrid stout keels and minutely rigidly ciliolate margins, lower about 0.3 mm. long, upper 0.6 mm.; *valve* stoutly keeled, not winged, keel rigidly

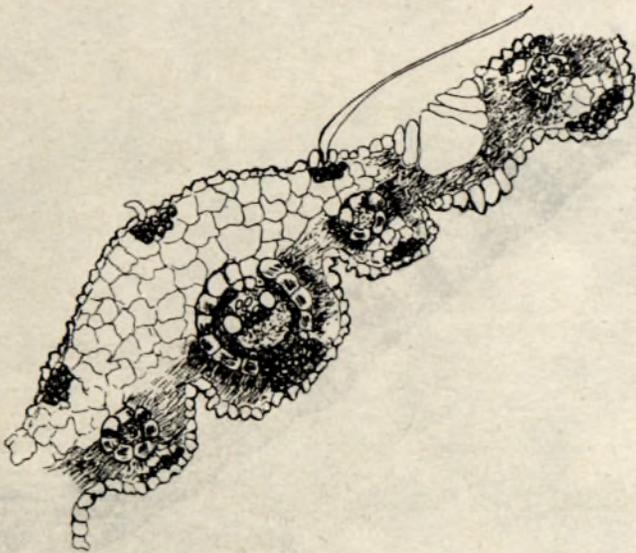


Fig. 6.

*C. plectostachyum*. Transverse sections of leaf-blades.

ciliate and produced into a short mucro, minutely pubescent on the back towards the margins; *pale* equalling or slightly exceeding the valve, 2-keeled, minutely pubescent between the minutely pectinate scabrid keels, rhachilla not produced; *anthers* 3, 1.5 mm. long; *stigmas* plumose from the middle; *lodicules* small, cuneate; *grain* linear oblong.

Pretoria: In grounds of Division of Botany (introduced) (H. 19254, in *National Herb.*).

2. *C. dactylon*, Pers.

Prostrate ascending and creeping perennial, sending out long underground and surface runners that root and shoot from the nodes. *Flowering culms* erect or sub-ascending, many-noded, the lower internodes very short, the upper gradually longer, smooth, glabrous, slender, from 7 to 30 cm. high; *leaf sheaths* smooth, hairy, or glabrous, except at the hairy mouth, lower short, but usually exceeding the internodes and, more or less, closely imbricating, upper longer and tightly enveloping the culms; *ligule* reduced to a short densely ciliate and fimbriate rim about 0.4 mm. long; *blades* narrow linear, 2-10 cm. long, up to 5 mm. wide, acutely acuminate or more often obtuse, glabrous, or hairy on the upper surface with tubercle based hairs, smooth except on the minutely scaberulous margins or scabrid

on the upper surface, mid-rib fine and prominent, with 2 primary and 8-9 secondary nerves on either side; *spikes* 3-5 (usually 4), seldom 2, digitate or sub-digitate, 3-5.5 cm. long, rhachis narrow, straight, keeled on the back, glabrous except at the base, smooth with minutely scaberulous margins, bearing imbricating spikelets from about 1 mm. above the base; *spikelets* oblong, elliptic, acute, up to 3 mm. long; *glumes* sub-equal, seldom equalling less than 0.5 of the spikelet and sometimes as long, acute, strongly 1-nerved with scabrid keel, upper glume somewhat broader than the lower; *valve* narrow and sub-acutely acuminate or ovate and sub-obtuse, 3-nerved, the mid-nerve sometimes produced from just below the tip into a minute mucro, keel shortly and more or less appressedly ciliate, not winged; *pale* equalling the valve, narrow oblong, canaliculate between the stout scabrid keels; *rhachilla* produced and often bearing a reduced floret; *lodicules* ovate, obtuse, about 0.25 mm. long; *anthers* 3, about 1 mm. long; *ovary* ovate; *stigmas* plumose, distinct, except at the very base.

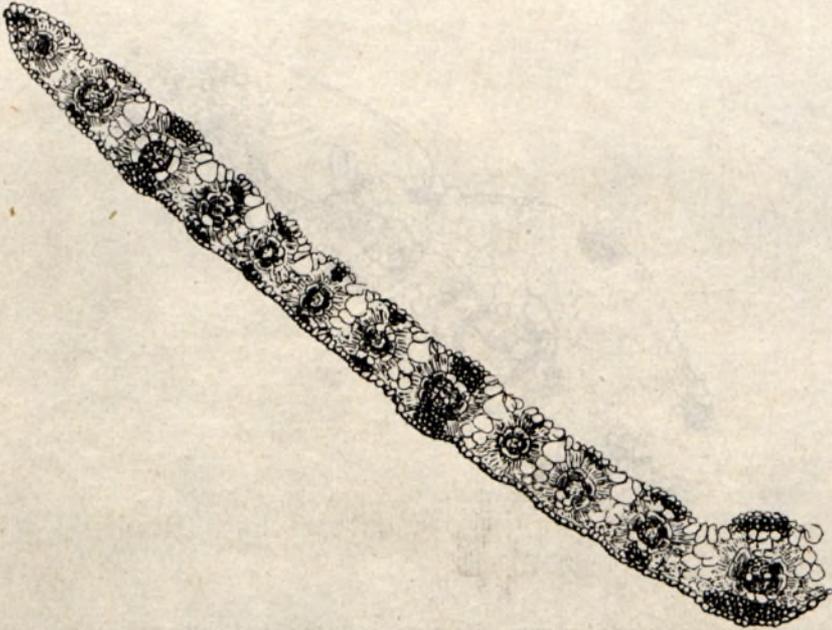


Fig. 1.  
*C. dactylon.*

CAPE PROVINCE.—Coastal District, South-West: Capetown, Claremont Flats, *Schlechter* 151 (*Herb. Alb. Mus.*); Kenilworth, *F. Bolus* (*Nat. Herb. Pret.*); Green Point, *Zeyher* 4519 (*Alb. Mus. Herb.*). South: Riversdale, *Muir* 3615 (*Nat. Herb. Pret.*); Humansdorp, Flats Witte Els Bosch, *Fourcade* 997 (*Herb. Alb. Mus.*); Uitenhage, Zwartkopsriver, *Zeyher* 4520 and 446 (*Herb. Mus. Austr.-Afr.*); "Aloes," near Port Elizabeth, *Burt-Davy* 11957 (*Nat. Herb. Pret.*); "Kaffraria," *Baur* 267 (*Alb. Mus. Herb.*). South-East: About homesteads, Komgha, *Flanagan* 1009 (*Nat. Herb. Pret. and Alb. Mus.*); Kentani, *Pegler* 246 (*Nat. Herb. Pret. and Alb. Mus. Herb.*); near Grahamstown, *MacOwan* 2119 (*Herb. Mus. Aust.-Afr.*); Katberg, near Sanatorium, *Schönland* 4342 (*Alb. Mus. Herb.*); Kowie, *Tyson* (H. 21822 in *Nat. Herb. Pret.*); Grahamstown, *Glass* 586 (*Herb. Mus. Aust.-Afr.*); Central District: Kuruman, *Mogg* 7695 (*Nat. Herb. Pret.*); Armoedsvlakte, Vryburg, *Theiler* (H. 20287 in *Nat. Herb. Pret.*).

NATAL PROVINCE.—Berea, Durban, *Wood* 5930 (*Nat. Herb. Pret., Alb. Mus. Herb., Herb. Mus. Aust.-Afr.*).

TRANSVAAL.—Pretoria District : Pretoria, *Leendertz* 1079 (*Nat. Herb. Pret.* and *Trans. Mus. Herb.*), *Mogg* (H. 16905 in *Nat. Herb. Pret.*), *Lounsbury* (H. 21823 in *Nat. Herb. Pret.*); *Leendertz* 3865 (*Trans. Mus. Herb.*); *Zwartspruit*, *Burt-Davy* 7108 (*Nat. Herb. Pret.*); *Groenkloof*, Old Natal Road, *Pole Evans* 320 (*Nat. Herb. Pret.*); *Johannesburg*, Hospital Hill, *Bryant* A. 30 (*Nat. Herb. Pret.*); *Germiston*, *Fenn* (H. 8746 in *Nat. Herb. Pret.*), *Leendertz* 6073 (*Trans. Mus. Herb.*); *Irene*, *Doornkloof*, *Pole Evans* 563 and 224 (*Nat. Herb. Pret.*); *Barberton*, *Pott* 5530 (*Trans. Mus. Herb.*); *Komatipoort*, *Burt-Davy* 368 (*Nat. Herb. Pret.*). *Waterberg* : *Pietpotgietersrust*, *Leendertz* 6688 (*Trans. Mus. Herb.*); *Naboomspruit*, *Galpin* M. 430 (*Nat. Herb. Pret.*); near *Nylstroom*, *Burt-Davy* 2080 and 2033 (*Nat. Herb. Pret.*); *Bushveld*, *Reck* (H. 3533 in *Nat. Herb. Pret.*). *Zoutpansberg* : *Tzaneen*, *Sampson* (H. 4391 in *Nat. Herb. Pret.*); *Rikatla*, *Junod* 68 (*Trans. Mus. Herb.*); the Downs, *Junod* 4101 (*Trans. Mus. Herb.* and *Nat. Herb. Pret.*); *Woodbush*, *Wager* (*Trans. Mus. Herb.* 12520). *Lichtenburg* : *Lichtenburg*, *Burt-Davy* 58 (*Nat. Herb. Pret.*). *Bloemhof* : *Schweizer Reneke*, *Burt-Davy* 1634; near *Bloemhof*, *Burt-Davy* 1515 (*Nat. Herb. Pret.*); *Christiana*, *Burt-Davy* 14094 (*Nat. Herb. Pret.*). *Marico* : *Zeerust*, *Leendertz* 11319 (*Trans. Mus. Herb.*). *Lydenburg* : *Lydenburg*, *Wilms* 12431 (*Trans. Mus. Herb.*); *Pilgrims Rest*, *Legat* (H. 1585 in *Nat. Herb. Pret.*); *Middelburg*, *Hewitt* (*Trans. Mus. Herb.* 12070); *Standerton*, *Leendertz* 11010. (*Trans. Mus. Herb.*); *Heidelberg*, *Vereeniging Burt-Davy* 5052 (*Nat. Mus. Pret.*); *Henley-on-Klip*, *Stent* (H. 21609, H. 21590 in *Nat. Herb. Pret.*).

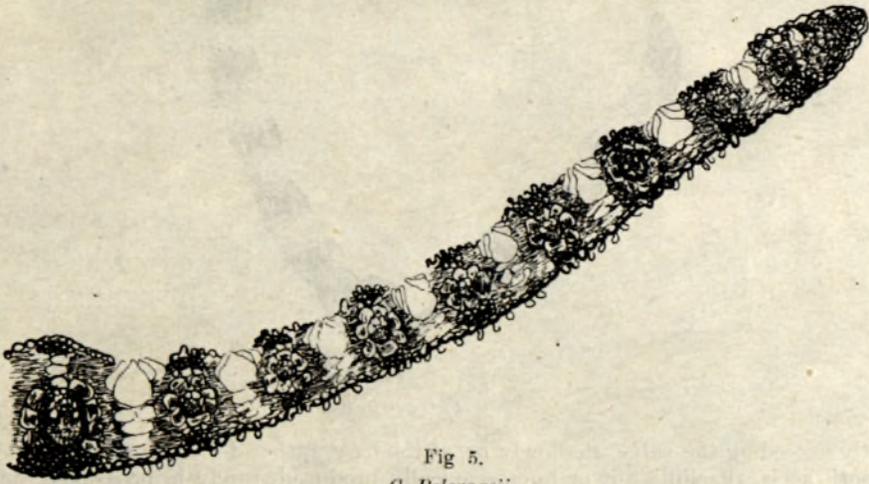


Fig 5.  
*C. Plevansii.*

ORANGE FREE STATE.—*Maccavlei*, *Heilbron*, *Brandmuller* 104 (*Nat. Herb. Pret.*); *Bloemfontein*, *Beck* (H. 21794 in *Nat. Herb. Pret.*).

A cosmopolitan species that seeds freely and is very variable in its habit. *Junod's* specimen from *Rikatla* is an unusually flaccid form with thin flat leaves resembling more some forms of *C. incompletus* in its habit; the same collector's 4101 from Downs is small and fine, with very narrow leaves and slender culms, and is scarcely distinguishable from *C. transvaalensis*. My specimen, H. 21590, from *Henley-on-Klip*, exhibits a form with very stout, rigid, many-jointed runners about 2 mm. in diameter with short internodes, the intravaginal shoots densely fasciated at each node, and the lowest sheaths short, broad, straw-coloured, and almost bladeless.

### 3. *Cynodon Plevansii*, *Stent*. n. sp.

Perennial, densely caespitose, rhizomes branched, and creeping stems short, prostrate, densely beset with short flowering and barren shoots, and covered with the persistent

sheath bases. *Flowering culms* erect or ascending, very slender, 2-noded, 6-8 cm. high (excluding inflorescence), nodes slightly contracted, glabrous, dull greenish, about 1 mm. long, internodes, usually exerted; *lower sheaths* and those of barren shoots mostly short (about 6-10 mm. long), broad, loose, finely ribbed, smooth, glabrous except at the long hairy mouth, culm sheath tightly rolled; *ligule* a very narrow fimbriate membranous rim, sparsely long hairy from the back; *blades* short, linear-cuneate, obtuse, rigid, flat or more often folded and, more or less, navicular, up to 2 cm. long by 2 mm. broad near the base, scabrid on the margins and keel and minutely so all over on the upper surface, glabrous, glaucous, finely 13-ribbed, mid-rib acutely keeled below, scarcely prominent above (blade of the uppermost culm-leaf much reduced). *Inflorescence* of 2-3-umbellate shortly peduncled spikes, spikes up to 2 cm. long, rather lax; *rhachis* pubescent at the base for 2-3 mm., otherwise glabrous or very microscopically pubescent, scabrid on the margins, about 0.5 mm. broad, usually flat on the back with a raised straight or wavy mid-rib on the face, bearing loosely appressed spikelets from about 2.3 mm. above the base. *Spikelets* rather narrow, oval, 3-3.3 mm. long, glabrous; *glumes* sub-equal, equalling about half the spikelet, strongly keeled, acute, glabrous, scabrid on the keels, lower sub-falcate, upper slightly broader and flatter; *valve* navicular with hyaline obtuse or sub-acute tip, hyaline margins, keel scabrid towards the tip, long, and softly ciliate below; *pale* acute with hyaline margins, equalling



Fig. 3.

*C. transvaalensis.*

or slightly exceeding the valve, shallowly or, at the base, rather deeply canaliculate between the smooth keels, rachilla not or microscopically produced, rarely in occasional spikelets long and bristlelike; *stamens* 3; *ovary* narrow, ovoid; *stigmas* laterally exerted, dark purple plumose from the middle; *lodicules* thinly fleshy, broadly cuneate, about 0.4 mm. long.

TRANSVAAL.—Barbers Pan, Lichtenburg District, *Pole Evans* 334. Very near to *C. transvaalensis*, from which it differs in the longer and more loosely arranged spikelets, rachilla not produced, rigid and somewhat glaucous leaves, etc.

#### 4. *C. transvaalensis*, Burt-Davy (Kew Bul., 1921, p. 281).

Perennial; long creeping stems, glabrous, smooth, purplish, very slender, about 1 mm. diameter, often rooting and sending forth from the nodes fascicles of short upright barren and flowering shoots and prostrate branches. *Culms* very slender, 5-10 cm. high, 2-3-noded, often branched from the lowest node, glabrous, sulcate, slightly contracted at the nodes; *sheaths* of the leaves smooth, finely striate, glabrous, or with a few scattered hairs, bearded at the mouth, the lowermost broad, short, lax, straw-coloured or purplish, those of the culm longer and tightly or rather loosely convolute; *ligule* membranous up to 0.4 mm.

long, and more or less fimbriate, or reduced to a ciliate rim; *blades* narrow, linear, subulate, about 1 mm. wide and up to 5 cm. long, obtuse to sub-acute, sometimes minutely apiculate, more or less hairy all over from tubercle based hairs, flaccid, green. *Inflorescence* consisting of 1-3, usually 2, digitate spikes terminating the culms; *spikes* short, 1-2 cm. long; *rhachis* narrow, 0.3-0.5 mm. wide, more or less, flattened with a straight or flexuous rounded keel on the face, scabrid on the margins, glabrous except at the often microscopically pubescent base. *Spikelets* more or less imbricating, oval, 2-2.5 mm. long, pallid, glabrous, except the keel, arranged on alternate notches of the rhachis, from 1-4 mm. above the base; *glumes* somewhat unequal, acute to sub-acute, firmly 1-nerved with scabrid keels, upper equalling about half the spikelet, lower somewhat shorter; *valve* membranous, with hyaline margins and tip, 3-nerved, side nerves long, mid-nerve minutely excurrent below the hyaline tip, keel ciliate, not at all winged, cilia about 0.25 mm. long; *pale* equalling or slightly exceeding the valve, with broadly rounded or cuneate and narrowly truncate hyaline tip, deeply canaliculate between the minutely scaberulous keels, rhachilla produced and bristle-like, or in some spikelets not produced; *stamens* 3; *lodicules* very small (about 0.3 mm.), cuneate, fleshy stigmas purple, plumose from above the middle; *ovary* ovoid; grain?

TRANSVAAL.—Uitval, Vereeniging, *Turner* (*Nat. Herb. Pret.* H. 21224; Lake Chrissie, Ermelo District, *Burt-Davy* 9270 (*Nat. Herb. Pret.*); Burgers Park, Pretoria (Cult.), *Stent* (*Nat. Herb. Pret.* H. 10799); Orange Grove, Johannesburg, *Bryant* C. 10 (*Nat. Herb. Pret.*).

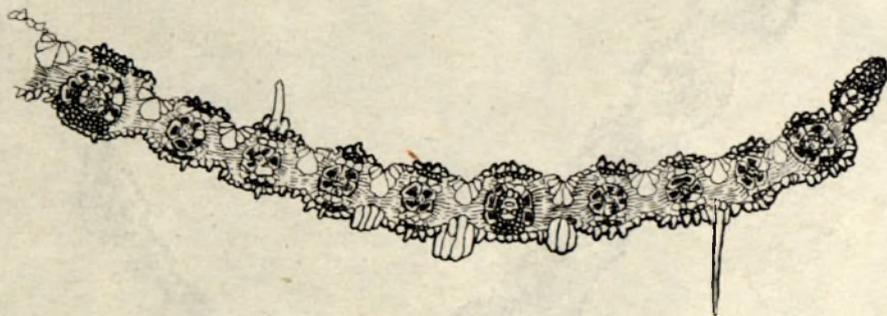


Fig. 4.  
*C. Bradleyi*.

ORANGE FREE STATE.—Kroonstad, *Hoffman* (*Nat. Herb. Pret.* H. 10802); Bloemfontein, *Beck* (*Nat. Herb. Pret.* H. 21795).

NATAL.—Country Club, Durban (Cult.), *Mackay* (*Nat. Herb. Pret.* H. 21824).

A very fine grass, much used for lawns. Appears to be a hybrid between *C. dactylon* and *C. incompletus*. It does not seed, but is propagated solely by roots and runners, and therefore remains more or less constant to type.

##### 5. *C. Bradleyi*, Stent, n. sp.

Creeping perennial. *Flowering culms* 1-2 noded, glabrous, smooth, finely striate, internodes enclosed or shortly exerted; *sheaths of leaves* glabrous or sparsely hairy, smooth, striate; *ligule* distinctly membranous, up to 1 mm. long and ciliate, seldom reduced to a ciliate rim; *blades* hairy from tubercle-based hairs, scabrid on the margin, 0.5-2 cm. long and about 1.5 mm. wide at the base, tapering to an obtuse apex, finely nerved, mid-rib, with 2 primary and 8-9 secondary nerves on either side, nerves fine but distinct, prominent on the under surface. *Spikes* 2-4, usually 3; *rhachis* sharply keeled, about 0.5 mm. wide, deeply and bluntly toothed on the margins at the insertion of the spikelets, rather long hairy at base and often bearing spikelets from near the base or from up to 2 mm. above. *Spikelets* imbricate, elliptic, and unequal-sided, glabrous, 2.5 mm. long; *glumes* sub-equal, equalling about half the spikelet, 1-nerved with prominent green, smooth

keel; *valve* sub-acute, glabrous except on the ciliate keel; *pale* equalling the valve with two firm green scabrid keels; *lodicules* minute, cuneate, fleshy; anthers 3; *stigmata* plumose, laterally exerted; *ovary* ovoid; grain not seen.

TRANSVAAL.—Orange Grove, Johannesburg, *Stent* (in Nat. Herb. Pret. H. 21852); *MacDonald* (in Nat. Herb. Pret. H. 21849).

Both specimens were from unbroken veld and occurred in close association with *C. dactylon* and *C. hirsutus*.

In the National Herbarium are several other specimens of Bradley grass taken from cultivated lawns and golf greens at Pretoria, Johannesburg, Durban, and Bloemfontein. Probably a hybrid.

#### 6. *C. hirsutus*, *Stent*. n. sp.

Creeping perennial. *Flowering culms* 1-2-noded, glabrous, smooth, finely striate; *sheaths of leaves* glabrous or finely hairy, smooth, striate, those of the basal and barren shoots short, 1.2 cm. long, those of the culm longer, rather loose; *ligule* membranous,

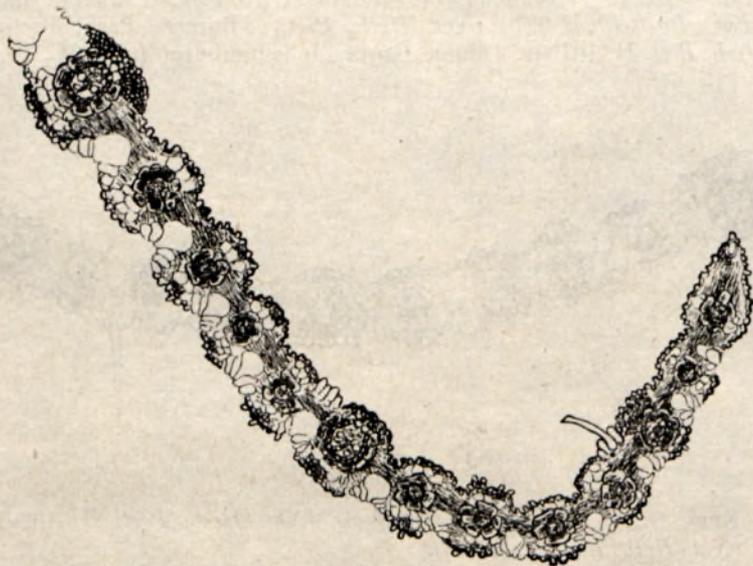


Fig. 2.  
*C. hirsutus*.

ovate, acute, irregularly toothed or fimbriate, up to 1.3 mm. long; *blades* rather blue-green, linear, tapering to a fine point, up to 7 cm. by 4 mm., usually shorter, hirsute on both sides from tubercle-based hairs, finely but distinctly ribbed, lateral primary nerves on either side the mid-rib 2, distinct with 10-11 fine but distinct secondary nerves. *Spikes* 4-5 (rarely with one spike some distance below the umbel); *rhachis* straight or somewhat flexuous, glabrous, more or less deeply and bluntly toothed on the margins at the insertion of the spikelets, about 1 mm. broad, flat or somewhat concave on the face, keeled (sometimes obscurely so) and purplish on the back, pubescent at the very base, and bare of spikelets for 2-5 mm. *Spikelets* crowded, imbricate, 2-2.5 mm. long, scarcely gaping; *glumes* unequal to sub-equal, lower equalling from half to two-thirds of the spikelet, ovate, acute, 1-nerved, stoutly keeled, keel narrowly winged below, obscurely ciliate, upper sub-equaling or slightly exceeding the spikelet, usually 3-nerved, nerves greenish, rather stout, lateral shorter, evanescent above, keel scabrid, not or very obscurely and shortly winged near the base; *valve* ovate, obtuse, glabrous, keeled, keel with a shortly ciliate wing in the

upper half; *pale* equalling the valve, 2-keeled, minutely bilobed, flat between the scabrid keels or slightly canaliculate below, rhachilla not produced; *anthers* 3; *stigmas* plumose; *ovary* ovate obtuse; *lodicules* truncate, obtuse, or minutely bilobed, 0.3 mm. long.

Var.  $\beta$  *parviglumis*, Stent.

*Glumes* shorter than in the type, never 3-nerved, whole plant less densely hairy.

TRANSVAAL.—Ermelo, Spionkop, *Burt-Davy* 9262; near Morgenzon, *Burt-Davy* 1011; Carolina, *Burt-Davy* 2713; Lydenburg District, Helvetia, near Lydenburg, *Burt-Davy* 7245; Zoutpansberg, New Agatha, *Burt-Davy* 1214.

NATAL.—Meteor Ridge, Mooi River, *Mogg* 3368 (*Nat. Herb. Pret.*).

Var.  $\beta$ .

TRANSVAAL.—Bloemhof District, Banks of Vaal River, *Burt-Davy* 1516; Schweizer Reneke, *Burt-Davy* 1635; Fourteen Streams, *Burt-Davy* 1555. Pretoria District, Pretoria, *Lounsbury* (*Nat. Herb. Pret.*).

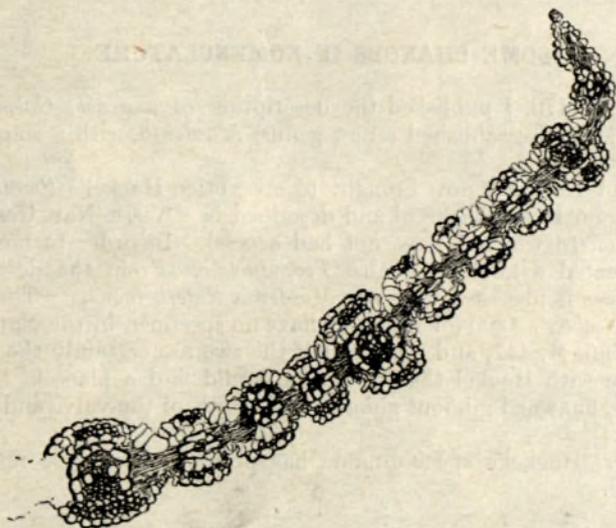


Fig. 7.

*C. incompletus*.

BASUTOLAND.—Leribe, *Dieterlen* 6340 (*Herb. Mus. Aust.-Afr.*).

The type is a more or less tropical grass; we have it also from Rhodesia; the variety seems to be chiefly confined to the drier regions of the western sand veld.

#### 7. *C. incompletus*, Nees.

Creeping perennial. *Flowering culms* erect or sub-geniculate, up to 24 cm. high, 1-2-noded, and usually branched from the lowest node, smooth, glabrous, striate; *sheaths* glabrous, of barren shoots up to 4 cm. long, rather lax, of the culm longer and tighter; *ligule* membranous, 1-1.3 mm., obtuse; *blades* flaccid, up to 12 cm. long by 3 mm. wide, those of the culms shorter, glabrous, or sparsely hairy, minutely scaberulous on both sides, scabrid on the margins, primary lateral nerves distinct, two on either side the prominent mid-rib. *Spikes* 3-5, usually 4, in a terminal umbel, rarely one spike a little distance below the other; *rhachis* glabrous, about 0.75 mm. wide, flat on the face, with scabrid margins and dorsal keel. *Spikelets* 3 mm., obliquely and narrowly oval; *glumes* unequal, lower small, 1-nerved, upper 1-1.5 mm. long, ovate, acute, with scabrid keel; *valve* glabrous,

3-nerved, with hyaline margins, obtuse tip, and a narrowly winged and rather rigidly ciliate keel; pale equalling the valve, obtuse or obtusely acuminate, with two rigid scabrid keels, canaliculate between; anthers 3; ovary ovate.

CAPE PROVINCE.—Albany District, Cradock Road, near Grahamstown, *Schönland* 4391 (*Alb. Mus. Herb.*); Carlisle Bridge, *Bowker* 8 (*Alb. Mus. Herb.*); Steenbokvlagte, Uitenhage, *Ecklon and Zeyher Gub.* (*Alb. Mus. Herb.*); Queenstown, Plains near Klass Smits River Bridge, *Galp.* 2353 (*Nat. Herb. Pret., Alb. Mus. Herb.*); Humansdorp, *Fourcade* 2553 (*Nat. Herb. Pret.*); Hanover, *Sim and Galp.* 6261 (*Nat. Herb. Pret.*); Grahamstown, *Daly and Sole* 157 and 2641 (*Alb. Mus. Herb.*); Camdeboosberg, *Drége* (*Herb. Aust.-Afr.*, 19484); Honey Nest Kloof, *Wilman* (*Nat. Herb. Pret. H.* 21825); near Grahamstown, *Schönland* 4391 (*Alb. Mus. Herb.*); Port Elizabeth, *Bishop* (*Nat. Herb. Pret. H.* 21848).

Ecklon's specimen from Steenbokvlagte does not appear to be the one quoted by Nees under his species *C. notatus*, since it has unequal glumes and is quite glabrous; it is probably Zeyher's from Uitenhage quoted under *C. incompletus*.

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### SOME CHANGES IN NOMENCLATURE.

In *Bothalia*, Vol. I, p. 170, I published the description of a grass, *Galpin* M. 447, from the Waterberg, for which I established a new genus, *Mosdenia*, with a single known species, *M. waterbergensis*.

The Director of Kew has now brought to my notice Hackel's *Perotis phleoides* based on *Schlechter* 4200 from Hammanskraal and described in "Viert. Nat. Ges. Zürich," XLIX (1904) (a publication to which I have not had access). In order to include the grass in *Perotis*, Hackel created a new sub-genus, *Tropidachne*. From the description it would appear that this grass is identical with my *Mosdenia waterbergensis*. The Director of Kew has kindly had *Schlechter's* 4200 (of which we have no specimen in the National Herbarium) compared with *Galpin* M. 447, and reports that the two are certainly the same grass.

I cannot agree with Hackel that the grass should find a place in the genus *Perotis*; the sessile spikelets, unawned gibbous glumes, and length of the valve and pale are sufficient to differentiate it.

Since, however, Hackel's specific name has priority, I propose renaming the grass *Mosdenia phleoides*.

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In the same number of *Bothalia* I published the description of a new species of *Eragrostis* under the name of *Eragrostis valida*. It has since been brought to my notice that in 1915 Pilger published, in "Wiss. Ergel. Schwed. Rhod. Kongo. Exped." (a publication not available in South Africa and not indexed in the most recent part of the "Index Kewensis"), the description of a tropical species of *Eragrostis* under the same specific name. I have not seen a specimen of Pilger's *Eragrostis valida*, but from the description it is not the same grass as mine of the same name. To avoid confusion, therefore, I propose to rename my species *Eragrostis robusta*.