Natal Plants.

Vol. 2.

Grasses.

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... and of...

Natal Government Herbarium.

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PREFACE.

In presenting this volume of figures and descriptions of 100 of the Natal indigenous grasses, it is with pleasure that I acknowledge our great indebtedness to the Director of the Royal Gardens, Kew, for permission to use the descriptions of these plants as given in Vol. VII. of the Flora Capensis, since the descriptions here given are taken entire from that work, the only differences being the division into paragraphs, and the use of capitals and italics, with the object of making them easier of reference for those not accustomed to botanical descriptions. To Dr. Stapf, who has been responsible for the work on this difficult Order, our very hearty thanks are also due.

To the list of the habitats of the different species as given in the Flora Capensis, I have added those taken from the specimens in our Herbarium, and I regret that so very little local information could be given as to the value of the species as fodder or grazing plants, such information is not easily obtained in a country where the species, or but few of them, have any distinctive vernacular names, but it is hoped that the publication of this work will be of some assistance in the way of gathering information together for publication in a separate form. It will be noticed that there is a difference between the Plates Nos. 1 to 50, and those from 51 to 100, the first 50 were drawn on transfer paper, the second 50 were drawn on an enlarged scale with Indian ink, and then transferred to the stone by the photo-lithographic process, this was done by the advice of Mr. John Singleton, who has very successfully carried out the lithographic work, and to whom I am much indebted for the suggestion.

I have also to offer my thanks to all those persons who assisted by contributing specimens, and in some cases information also, to Mr. Mason for specimens collected in the Mooi River district, Mr. J. T. St. George for specimens collected near Maritzburg, and Messrs. Jenkinson and Swanfield for Zululand specimens. The set of specimens collected by the late Rev. John Buchanan, which is now in the Herbarium, has been of the greatest service, especially so as the numbers are so frequently referred to in the Flora Capensis. A number of specimens collected in the Dundee district by the late Mr. W. E. Green have also been very useful. The drawings and dissections were done in the Herbarium by Miss Lauth, and the drawings of the several parts have been compared, both with the plants and with Dr. Stapf's descriptions. At the end of the volume I note a few corrections of the details which were discovered on going over the drawings when the last part of the volume was completed.

In conclusion, it is necessary for me to state that, without the liberal grants allowed by Government for the different parts of this work as published, it would not be possible for it to be continued, except at such a loss as the Botanic Society would not be justified in accepting.

J. MEDLEY WOOD,
Director.
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Notes on Some of the Species.

Plate 119.—Andropogon Halepense, Brotn. var effusus, Stapf.

In June, 1901, an assistant in the office of the Agrostologist of the United States of America was directed to make investigations, and to report on the methods used for the extermination of this grass in places "where it had become a pest." The report was published in pamphlet form, and the following is a summary:—

"Johnson grass is a tall, vigorous grass, closely related to the Sorghums, with a very strong system of long, jointed, underground stems, popularly known as roots. Each joint of this underground stem is capable of producing a new plant.

"It is a native of the tropics of the Old World, and was first introduced into this country as a hay grass in South Carolina about sixty years ago.

"It has spread rapidly throughout the entire south to the Pacific coast, and thence to British Columbia. It thrives best in rich, moist alluvial or irrigated soil, where it is also most difficult to eradicate.

"It is commonly spread by means of its seeds. They are widely scattered from hay, cut after the seed has matured, and are often planted with seed oats. The seeds are unharmed by passing through the digestive tract of animals, and are thus widely scattered in manure.

"The grass should never be allowed to ripen its seed in meadows, fields, or along roads, fences, or railways.

"It can be destroyed by hand labour, digging out the underground stems.

"Under field conditions, it is best killed by ploughing fallow land during hot, dry weather. The stems are thus exposed to the heat of the sun and soon killed. The same result follows the action of severe frosts.

"It can also be killed during the cultivation of a cotton crop by much extra hand labour.

"Various chemical substances have been tried, but none have thus far proved successful and economical.

"Johnson grass makes a very good quality of hay when cut when just in flower, and it may be profitably cultivated throughout the south for this purpose.

"Meadows should be broken up at least every third year to loosen the matted stems. It is not necessary to re-seed the meadows when thus treated.

"Cow peas may be sown in the grass when it is broken in the spring. When broken in the fall, oats may be used with it. It affords good pasture during summer when treated in the same way as meadows."

Our plant, it will be seen, is the variety "effusus," but from experience in the Botanic Gardens it will be found quite as difficult to eradicate as the type.

Plate 122.—Andropogon Nardus, Linn. var validus, Stapf.

Of this grass Baron F. v. Mueller says: "One of the lemon-scented grasses. It yields an essential oil for condiment and perfumery, and is occasionally used for tea. Simmonds gives the export value of this oil as from Ceylon alone at £7,000."
This is also one of the lemon grasses. It will live in arid places. The medicinal "Sirri Oil," is prepared from the root.

Baron F. v. Mueller says: "Much liked by pasture animals, grows readily in poor stony ground; forms very large patches."

This is known as "Finger-grass" or "Crab-grass," and is said to be a useful pasture plant, and to succeed in swampy places and under shade. It is good as a sand-stay, but does not stand frost well, and in cold climates it is an annual. It can be propagated either by seeds or by division of the roots. Formerly known as Panicum sanguinale, Linn.

Of the type species, Baron F. v. Mueller says: "Evidently one of the hardier species, particularly eligible for wet brackish ground. Vegetates luxuriantly in the hottest part of summer, the stems lengthening sometimes to 7 feet, soon bending, and then rooting from the lower joints, throwing out numerous shoots from them, which grow rapidly, allowing of repeated cutting. Stems thick, succulent, sweetish; panicles to 2 feet long. Through all stages of its growth this grass is much relished by horses and cattle."

Baron F. v. Mueller says of this grass: "It is perennial, creeping and admirable for binding sea-sand and loose soil of river banks, also for forming garden edges and for establishing a grass sward on lawns much subjected to traffic. Generally not liked by pasture animals, and for this reason all the more eligible for consolidating rolling coast sand. It kept alive in the hottest and driest region of Central Australia . . . . . it endures also some frost, even the tender portion of its blade, and has shown itself adapted for recently reclaimed swamp land."
Notes on the Drawings.

Plate 116.—Andropogon amplexens, Nees.
    Fig 5 should be lower, not upper valve.

Plate 146.—Panicum Helopus, Trin.
    Fig 1 should be upper glume, 1a lower glume.

Plate 150.—Panicum trichopus, Hochst.
    Fig 6 is lower valve, not lower glume.

Plate 152.—Panicum æquinerve, Nees.
    Fig 1, lower glume in our specimen is 7-, not 5-nerved as stated in text.

Plate 154.—Panicum zizanioides, H.B.K.
    Fig 5, pale, should be acute as stated in text.

Plate 155.—Panicum densum, Thb.
    Fig 3, lower valve is shown acute, should be obtuse.

Plate 157.—Panicum laevifolium, Hack.
    Fig 3, upper glume, and Fig 4, lower valve, should be obtuse, not acute as shown.

Plate 159.—Panicum proliferum, Lam. var.
    Fig 1, lower glume is shown too flat.

Plate 166.—Axonopus semialatus, Hk. var.
    Figures wrongly numbered, Fig 6 should be lower valve, Fig 3 upper valve.

Plate 169.—Setaria nigrirostris, Dur. and Schinz.
    Fig 7, upper valve is 5-nerved, not clearly shown in drawing.

Plate 199.—Aristida junciformis, Trin.
    Lodicules are sub-acute, not truncate as shown.

Plate 200.—Aristida Sciuars, Stapf.
    Lodicules are rounded at apex, not truncate as shown in drawing.
Imperata arundinacea. Cyri.
PLATE 101.


Perennial, rather coarse, few culms in a stool; on jointed creeping rootstocks, which are completely clothed with imbricate, leafy, veiny scales.

Culms, \(\frac{1}{2}-4\) feet long, erect, 3-4-noded, glabrous. Sheaths rather loose, glabrous, the lowest at length breaking up into fibres; ligules membranous, short, hairy. Blades linear from a very narrow base, tapering to an acute point, the lowest \(\frac{1}{2}-1\) foot long, by 1-2 lines broad, the upper very short, rigid, usually convolute, glabrous or bearded at the base, smooth below, margin scabrid, midrib stout.

Panicle spiciform, 2-8 inches long, cylindric, very dense, branches and branchlets very numerous, crowded, appressed, pedicels fine, with clavate tips, \(\frac{1}{2}-1\frac{1}{2}\) line long, with fine long hairs below.

Spikelets about \(2\frac{1}{2}\) lines long, pale or purplish, enveloped by hairs 5-6 lines long. Glumes ovate-oblong, to ovate-lanceolate, obtuse or subobtuse, with the tips ciliate, usually 5-7-nerved. Valves, lower oblong, obtuse, denticulate, ciliate, nerveless; upper ovate, acute, glabrous, nerveless. Anthers \(1\frac{1}{2}-2\frac{1}{4}\) lines long. Stigmas \(1\frac{1}{2}-2\frac{1}{2}\) lines long, purple.


Drawn and described from specimens gathered near Durban, February, 1899.

This genus includes five closely allied species, all natives of warm countries. The present species is common in moist ground in the coast districts, and extends to the uplands and Zululand. It has little if any value as a pasture grass, and its presence is, I think, usually indicative of a moist subsoil, but further information on this point is desirable. I have not been able to ascertain its native name. Baron F. v. Mueller says of it: “The Lalang grass of India. Structurally almost a Sugar Cane in miniature. Valuable for binding sand, especially in wet localities. Available also for thatching, and for litter of resisting qualities. Pretty in table bouquets. Apt to become irrepressible in cultivated ground. Browsed on by pasture animals, though harsh; ought to be suitable for ensilage.”

Fig. 1, Plant reduced; 2, lower glume; 3, upper glume; 4, lowest valve; 5, upper valve; 6, pale; 7, ovary, stamens, style and stigmas; 8, branchlet with spikelets; 9, pedicels after disarticulation. Except fig. 1, all enlarged.
PLATE 102.

Saccharum Munroanum (Hack. Androp. in DC. Mongr. Plan. vi. 124.)

Culms 2 feet long, 3-noded.

Leaves, lower crowded. Sheaths rather lax, scantily hairy at the nodes, otherwise glabrous, the lowest shining as if lacquered; ligule short with hairs from the base behind, otherwise glabrous. Blades narrow, linear, acute, flat, 4-5 inches long, by 2 lines (or by less than 1 line in the more or less convolute innovation leaves), rigid, puberulous on both sides, margin smooth.

Panicle oblong, 4-5 inches long, dense, fulvous or ferruginous, shining. Racemes ½ to almost 1 inch long, rather stout; joints and pedicels stout, ciliate.

Spikelets crowded, lanceolate. Sessile spikelet 2-2½ lines long, enveloped by rigid hairs. Glumes, lower chartaceous, entire, subobtuse, 2-keeled and 4-nerved between the keels, which are long ciliate above the middle; upper more acute, 1-3 nerves, ciliate along the margins and on the keel above the middle. Valves, lower 1½-1¾ line long, lanceolate; upper very small, ovate, nerveless, tips ciliate. Pale 0. Anthers 1 line long. Grain obovoid, globose, ½ line long. Pedicelled spikelets similar but smaller (1½-1¾ line long), enveloping hairs more copious. Anthers rudimentary, very minute.

Habitat: Natal. Drakensberg, near Coldstream, 5500 feet, Rehmann 6876; Umphumulo, in marshes, 2000 feet, Buchanan 212; Greytown, Wood 7357.

Drawn and described from specimens gathered near Greytown, Wood 7357.

The genus Saccharum includes 12 species widely distributed in tropical and subtropical regions of the Old World, one or two only being found in America and West India Islands. The above described species is so far as at present known, the only South African one, and is confined to South Africa. It has been hitherto known as Eriochrysis pallida, Munro. The best known species of this genus is S. officinarum, the "Sugar Cane," but in outward appearance there is little similarity between the two plants.

Fig 1, Plant about natural size; 2, spikelets (sessile and pedicelled) in position on rachilla; 3, lowest glume of sessile spikelet; 3a, lowest glume of pedicelled spikelet; 4, upper glume; 4a, same, side view; 5, lower valve; 6, upper valve; 7, lodicules, ovary, style, and stamens of sessile spikelet; 8, same of pedicelled spikelet. Except fig. 1, all enlarged.
Saccharum munroanum, Hack.
PLATE 103.


Annual.—Culms very slender, decumbent, rooting, branched below, 2-5 feet long, many-noded, grooved.

Leaves: Sheaths as long as, or the upper shorter than, the internodes, terete, tight, finely hairy or glabrescent. Ligules membranous, glabrous. Blades spreading, lanceolate from a constricted base, acuminate, 1-2½ inches long by 2-7 lines wide, thin, often flaccid, glabrous or with a few tubercle-based hairs.

Racemes (false spikes) 3-6, somewhat distant on a common axis, very slender, flexuous, 1-4 inches long, green, joints equalling or exceeding the spikelets, glabrous. Pedicels like the joints but shorter.

Spikelets rather distant, linear-lanceolate, 2 lines long, minutely bearded at the base. Glumes membranous, lower bicuspidate, dorsally concave, 2-keeled, keels scaberulous, upper acuminate, 1-nerved, obscurely keeled, ciliolate. Valves, lower empty, linear-lanceolate, 1½ line long, hyaline, glabrous, nerveless; upper linear very narrow, ½ line long, hyaline, 1-nerved, awn terminal, finely capillary, flexuous, 6-9 lines long. Pale 0. Anthers ½ line long. Grain 1 line long.

Habitat: Natal. Riet Vlei in bush, 6000 feet, Buchanan, 292.

Drawn from Buchanan's specimen in Natal Government Herbarium.

Apparently a somewhat rare species in Natal since it is not reported as having been gathered in any other locality, and Buchanan's is the only specimen in the Government Herbarium. It appears to be plentiful in India, but I cannot learn that it is of much value as a pasture grass.

Fig. 1, Plant about natural size; 2, lowest glume, back view; 2a, same, front view; 3, upper glume, back view; 3a, same, side view; 4, lower valve; 5, upper valve; 6, ovary, stamens, stigma, and lodicules; 7, rachis and spikelets. Except fig. 1, all enlarged.
PLATE 104.


Perennial.—Culms ascending or suberect from a slender creeping rhizome, more or less branched and fascicled near the base, or simple; 1-3 feet long, rather slender, glabrous, 5-many noded. Sheaths equalling or exceeding the internodes, subterete, glabrous, rarely hairy; ligules minute, truncate, ciliate. Blades linear-lanceolate, setaceous acuminate; 3-8 inches long by 3-6 lines broad, flat, quite glabrous, or hairy on the back near base, smooth, midrib white.

Racemes (false spikes) fascicled, 2-5, stout, straight or flexuous, 2-5 inches long, hairy; joints stout, triquetrous, 1⅓-1½ line long, slightly curved, keel (outer angle) ciliate with yellowish hairs.

Spikelets 2-nate, 1 subsessile the other pedicelled. Subsessile spikelets 2½-3 lines long, reddish above, pedicel ½ line long or shorter, bearded at the base. Glumes, lower lanceolate-oblong, acutely and shortly 2-toothed, coriaceous below, flat and more or less distinctly 5-ribbed on the back, scaberulous, scantily hairy, keels winged near the tips, scabrid, intracarinal nerves 5-9: upper slightly longer than the lower, lanceolate, acuminate, mucronate, 3-5-nerved, keeled above. Valves, lower lanceolate, almost as long as the subtending glume, rigidly membranous, glabrous, 3-nerved, with an almost equal pale and a male flower; upper oblong, hyaline, deeply 2-fid, 2 lines long, delicately membranous, 3-nerved, lobes very broad, ciliate; awn 4-5 lines long, twisted below. Pale as long as, or slightly longer than, the valve, acute. Anthers 1 line long. Pedicelled spikelets 2½ lines long, reddish, pedicel 2 lines long, more or less hairy on the back. Lower glume lanceolate, boat-shaped, keeled, 7-9-nerved, loosely hairy; the rest as in the subsessile spikelets.

Habitat: Natal. Coast districts generally, often in woods and marshy places. Near Durban, Buchanan 32; 109; Wood 5945; near Umzimkulu, Drège; Umppumulo, Buchanan 209; without precise locality, Gerrard 679; Harvey 49; Zululand, Jenkinson 87.

Figured from specimens gathered near Durban, February, 1899.

In Harvey's genera of South African plants, this is quoted as Spodiopegon arcuatus, Nees. Good for pasture, according to Mr. Celliers, per Mr. W. E. Green.

Fig. 1, Plant about natural size; 2, rhachis with sessile and subsessile spikelets. Sessile spikelet:—3, Lower glume; 3a, same, back view; 4, upper glume, side view; 5, lower valve; 6, pale of same; 7, perfect stamens and lodicules; 8, upper valve; 9, pale of same; 10, ovary, style and stigmas. Except fig. 1, all enlarged.
[schaemum fasciculatum, Brongn. var arcuatum, Hack.
PLATE 105.

ROTTBELLIA COMPRESSA (Linn. f. Suppl. 114), var. fasciculata (Hack. Androp. in DC. Monogr. Phan. vi. 286).

Perennial.—Culms erect from a decumbent rooting base, branched, compressed, glabrous, 1-5 feet long. Sheaths shorter than the internodes, compressed, keeled, often ciliate at the mouth, otherwise glabrous. Ligules membranous, very short, ciliate. Blades linear, gradually tapering, acute, very variable in length and width, uppermost almost suppressed, somewhat rigid, glabrous.

Racemes often fascicled, rather stout, straight or curved, with the appearance of true spikes owing to the pedicels of the upper spikelets being adnate to the contiguous joint; more or less fragile.

Spikelets linear-oblong to oblong; 3-3½ lines long, glabrous. Glumes equal, lower coriaceous, constricted below the obtuse tips, or in the pedicelled spikelet more acuminate, finely 7-9-nerved; upper broadly lanceolate, acuminate, membranous and 3-nerved in the sessile, sub-chartaceous, and 5-7-nerved in the pedicelled spikelets. Valves sub-equal, nerveless, 2-2½ lines long. Pale linear, 1-1½ line long, lodicules 2, cuneate. Stamens 3. Anthers 1-1½ line long. Stigmas generally laterally exserted. Grain broadly oblong.

Habitat: Natal. By the Umlaas River, Krauss; by streamlets near Umquumbulo, Buchanan 198; without precise locality, Buchanan 74; Gerrard 677; near Dundee, W. E. Green 31; near Durban, Wood 7526.

Figured from Wood's specimen No. 7526.

Throughout the warm countries of both hemispheres, in many localities evidently introduced. The type through India to S.W. China. Of this grass Baron F. v. Mueller says:—"This perennial grass, though somewhat harsh, is recommendable for moist pastures, and will retain a beautiful green throughout the year in dry climes; highly esteemed by graziers in Gippsland; it is not injured by moderate frost." Mr. Cellier of Dundee says that it is good for pasture.

Fig. 1, Portion of plant, natural size; 2, rhachis with sessile and pedicelled spikelets; 3, lower glume; 4, upper glume of sessile spikelet; 4a, upper glume of pedicelled spikelet; 5, lower valve; 6, upper valve; 7, pale; 8, ovary, style, stigmas, stamens, and lodicules. Except fig. 1, all enlarged.

Culms up to 3 feet and more long, stout, sheathed nearly all along, glabrous. Sheaths glabrous or scantily and appressedly hirsute near the margins. Ligules about 1 line long, rounded. Blades broadly linear from a narrow base, tapering to a long acute point, flat, firm, smooth, green, densely bearded at the base inside, otherwise glabrous; 1-3 feet long, 4-6 lines wide.

Panicle 1-1½ foot long, linear-oblong, usually sheathed at the base, much branched, branches and branchlets sub-erect, filiform, like the rachis quite glabrous, the lowest 3-4 rarely 6 inches long.

Racemes obscurely articulate, tough, joints equalling or exceeding the spikelets, bearded at base. Pedicels unequal, one very short, the other almost as long as the spikelet, both filiform.

Spikelets oblong to oblong-lanceolate, pale or reddish brown, loosely hairy, 2-2½ lines long, the hairs about ½ line long. Glumes chartaceous, the lower minutely 2-toothed, usually with 2 intracarinal nerves, the upper broadly lanceolate, boat-shaped, sub-acute, 3-nerved, keeled. Valves, lower lanceolate, about as long as the lower glume, hyaline above, 1-3-nerved, ciliate; upper linear-oblong, acutely bifid, 3-nerved, ciliate, 1-1½ line long. Awn 2-4 lines long; column short. Pale very small, long, ciliate. Lodicules cuneate, ciliate.

Habitat: Natal. Among reeds by Umlaas River, Krauss 159; feeder of Tugela River, 1000 feet alt., Buchanan 271; Zululand, Jenkinson 82.

Figured from Jenkinson's specimens, the only ones in the Government Herbarium.

A genus of 20 or more species, mostly tropical, the one here described being so far as at present known the only one found in Natal. It is a coarse grass and of little if any use for pastures. Usually, I think, found in moist places, and in large clumps. The native name is um-Tala, and it is often used by them for thatching purposes.

Fig. 1, Portion of inflorescence and leaf, natural size; 2, lower glume; 3, upper glume; 4, lower valve; 5, upper valve; 6, stamens and pistil. Except fig. 1, all enlarged.
Erianthus capensis Nees var. villosa Stapf
PLATE 107.

TRACHYPAGON POLYMORPHUS (Hack. in Mart. Fl. Bras. II. iii. 263), var. capensis (Hack. Androp. in DC. Monogr. Phan. vi. 326).

CULMS erect, slender, simple, terete, glabrous, few-noded, 1½-3 feet long.

LEAVES mainly crowded near the base. Sheaths terete, tight, generally exceeding the internodes, bearded at the nodes, otherwise glabrous or scantily and fugaciously hairy. Ligules firm, up to 2 lines long. Blades very narrow, linear, tapering to a long setaceous point, usually convolute, glabrous or hirsute at the base, rarely hairy all over; 4-10 inches long, 3-2 lines wide.

RACEMES solitary, straight or sub-flexuous, 3-7 inches long. Rhachis sub-terete, glabrous. Male spikelets subsessile, oblong, hairy, 3-4 lines long. Glumes, lower obtuse or 2-toothed, keels crested, ciliate, intracarinal nerves about 7, margins very narrowly inflexed; upper linear-oblong, subacute, subglabrous, 3-nerved, margins softly ciliate. Stamens 3. Anthers 1½-2 lines long. Perfect spikelets 3½-4½ lines long. Pedicels very slender, about 1½ line long, scantily long-hairy. Glumes, lower oblong-linear, minutely truncate, ciliate near the membranous reddish tips, otherwise more or less hairy, nerves 8-11, transversely anastomosing, callus 1 line long; upper lanceolate-linear, obtuse, strongly 3-nerved, scantily hairy above. Awn of upper valve 1½-2½ inches long, softly hairy with hairs decreasing upwards, or the bristle scabrid.

Habitat: NATAL. Umpumulo, Buchanan 153; Riet Vlei, Buchanan 154, 155; Inanda, Wood 1621; and without precise locality, Buchanan 125, Gerrard 476; Zululand, Jenkinson 22; Zululand, Swanfield; Dundee, W. E. Green 77, 80, 91.

Figured from Swanfield's specimen.

The plant above described is the only species of the genus, and extends by its many varieties through tropical and sub-tropical America. In Africa it is found from Cape Colony to the Congo, and it also occurs in Madagascar. The twisted awn as shown in the figure was only seen in few specimens; it appears to be usually straight.

Fig. 1, Plant about natural size; 2, rhachis with long and short pedicelled spikelets; 3, long pedicelled spikelet, lower glume; 4, upper glume; 5, ovary, style, stigma, stamens and lodicules; 6, upper valve, short pedicelled spikelet; 7, lower glume, back view; 8, same, front view; 9, upper glume; 10, lower valve; 11, stamen, imperfect ovary and lodicule; 12, upper valve. Except fig. 1, all enlarged.
PLATE 108.


Densely cespitose; innovation shoots intravaginal.

Culms slender, simple, rarely with a lateral flowering branch from the upper part; 1-2 feet long, more or less compressed below, glabrous, 2-3-noded. Leaves mainly crowded at the base; lower sheaths compressed, villous at the very base, appressedly and usually fugaciously hirsute above, or glabrous except near the mouth; upper ones terete, tight, shorter than the internodes, the uppermost sometimes tumid with a minute blade. Ligules truncate, ciliolate, with long hairs from behind. Blades very narrow, linear, acute, generally tightly convolute and filiform; 4-12 inches long by about 1 line wide, erect, rigid, sulcate, flexuous or curved, glabrous or hirsute at the base.

Raceme (false spike) 3-6 inches long, rather stout, straight or flexuous, whitish-silky, joints rather stout or slender to 2 lines long, long and densely villous on the back. Sessile spikelets lanceolate, acuminate, 4-5 lines long. Glumes, lower herbaceous to chartaceous, bicuspidate, villous to subglabrous on the back, intracarinal nerves about 6, evanescent below, keels acute, long and densely ciliate in the lower part with tubercle-based tufts of hairs, and with oil glands nearly all along; callus short, obtuse, hairy; upper acute, 3-nerved, pubescent along the fine prominent keel, margins softly ciliate. Valves, lower lanceolate, 2½ lines long, 2-nerved; upper oblong-lanceolate, 2 lines long, 3-nerved; margins of both softly ciliate. Pale very minute. Author's 2 lines long. Pedicelled spikelets 2½-3 lines long, pedicels up to 2 lines long like the joints. Glumes, lower entire or sub-entire, one margin inflexed, the other spreading; intracarinal nerves 5-6; upper 3-5-nerved, otherwise as in the sessile spikelet except the sex.

Habitat: Natal. Umpumulo and Riet Vlei, Buchanan 161; without precise locality, Gerrard 768, Buchanan 52; Zululand, Buchanan 161a; Mooi River, Mason 3, 43; Dundee, W. E. Green 68; Zululand, Jenkinson 94.

Figured from the specimen sent by Mr. W. E. Green, compared also with Buchanan’s 161 and Mason’s 3, all of which agree except in size of plant and length of inflorescence. We find, however, that in all the specimens examined the lower valve of the sessile spikelet and the upper glume of the pedicelled one are truncate, not acute, and crested as shown in the drawing.

Found also in Abyssinia. Some species of the genus yield an aromatic oil, and a variety of the present species, E. argenteus, var. thymiodora, found in the Cape Colony, probably has this peculiarity.

Fig. 1, Plant about natural size; 2, sessile spikelet, lower glume; 3, upper glume; 3a, same, back view; 4, lower valve; 5, upper valve; 6, ovary, style, stigmas and lodicule; 7, pedicelled spikelet, lower glume; 8, upper glume; 9, rhachis with sessile and pedicelled spikelets. Except fig. 1, all enlarged.
Elionurus argenteus, Nees.
Pollinia villosa, Spreng.
PLATE 109.

**Pollinia villosa** (Spreng. Syst. I. 288, non Benth.)

**Perennial.**—Culms 1½-3 feet long, rather stout, 3-4-noded, appressedly hirsute or pubescent at least below the nodes, and at the top. Sheaths usually exceeding the internodes except the uppermost, terete, tight, scantily hairy to villous or glabrescent, bearded at the nodes. Ligules membranous, ¼-1 line long, glabrous. Blades lanceolate-linear, gradually passing into the sheath, shortly acute, 4-7 inches long, 3-6 lines wide, flat, sub-erect, glabrous or more or less appressedly hairy.

**Racemes** (false spikes) 2-7, on a short common axis, sub-erect, stout, 2-6 inches long, joints and pedicels linear, stout, with long silvery grey hairs mainly along the margins and round the base, about 1½-2½ lines long. Spikelets crowded, ferruginous, lanceolate, 2½-3½ lines long. Glumes coriaceous, lower minutely truncate, dorsally depressed, margins broadly inflexed, keels long and densely ciliate; upper lanceolate, boat-shaped, shining, 3-nerved, keel ciliate above. Valves, lower empty, almost as long as the subtending glume, membranous below, hyaline above, 2-nerved, margins inflexed, ciliate; upper ovate-oblong, about 1½ line long, acutely bifid to the middle, lobes ciliate. Awn 7-10 lines long, kneed above the middle. Pale small, oblong, obtuse, ciliate. Stamens 3. Anthers 1½ line long. Lodicules 2, small, cuneate.


Figured from Swanfield’s specimen, and compared with Buchanan’s and Mason’s.

This species was formerly known in Natal as *Eulalia villosa*, Nees, but is now included in the genus *Pollinia*.

Fig. 1, Plant about natural size; 2, rhachis with sessile and pedicelled spikelets; 3, lower glume, front view; 3a, same, back view; 4, upper glume, front view; 4a, same, side view; 5, lower valve; 6, upper valve; 7, ovary, style, stigmas, stamens, and lodicules; 8, pale. Except fig. 1, all enlarged.
PLATE 110.

Urelytrum squarrosum (Hack. Androp. in DC. Monogr. Phan. vi. 272).

Compactly tufted.—Culms 2-2 1/2 feet long, glabrous, few-noded. Sheaths exceeding the internodes except the uppermost, tight, terete, glabrous, smooth, the lower widened, very firm, shining, persistent. Ligules oblong, 2-3 lines long, glabrous or with a few long hairs behind. Blades very narrow, linear, tapering to a setaceous point, lowest up to 1 foot, by 3/4-1 1/4 line, flat, convolute, rather rigid, glabrous, prominently nerved and finely scaberulous above.

Racemes (false spikes) 5-6 inches long, 1 1/2-2 lines thick, almost glabrous to villous. Joints obliquely truncate, 3-4 lines long, silky at the base, scantly pubescent to villous above, appendage up to 2 lines long, unequally lobed or toothed, ciliolate.

Spikelets heteromorphous, 2-nate (one sessile the other pedicelled) on the very fragile rhachis of solitary terminal, sub-cylindric spikes or racemes, the sessile deciduous, with contiguous joint of the rhachis and pedicel. Sessile spikelets, florets 2, lower male, upper perfect, about 4 lines long. Glumes, lower oblong to lanceolate, obtuse to acute, glabrous, smooth or punctate or pubescent to villous, keels 2, acute, at least above, distantly (sometimes obscurely) spinulously mucrulate at the middle, rigidly ciliate above, with 1-3 intracarinal nerves which are more or less prominent towards the tips; upper lanceolate, acute, firmly membranous, 3-nerved, side nerves sub-marginal, keel rigidly ciliate above, margins softly ciliate. Valves hyaline, sub-equal, slightly shorter than the glumes, softly ciliate, about 3 lines long; lower 2-nerved, lanceolate, acute; upper 3-sub-5-nerved, ovate, lanceolate, obtuse to sub-acute, mucronulate. Pales almost equalling their valves, hyaline, 2-nerved. Loculicules 2, cuneate. Stamens 3. Anthers 1 1/2-2 lines long. Stigmas laterally exerted. Pedicelled spikelets varying in hairiness like the sessile, narrow and usually smaller than them, with 2 male florets or (often in the same raceme) more or less reduced, sometimes to an awn representing the lower glume, and a minute rudiment of the upper. Awn squarrose, flattened below, scabrid, 1 1/2-3 1/2 inches long.


Figured from Green's specimen, which is the only one in the Government Herbarium.

The lower floret of the sessile spikelet consists of the lower valve, rudimentary and minute ovary, with stamens and loculicules, and the pale of upper valve is thickened and fleshy below, and hyaline above, and the infolded margins are auricled at the base.

A very hard grass. (Mr. Celliers per Mr. W. E. Green).

Fig. 1, Plant about natural size; 2, joint of rhachis. Sessile spikelet, 3, lower glume, back view; 3a, same, front view; 4, upper glume, side view; 5, lower valve; 6, pale of same; 7, upper valve; 8, pale of same; 9, ovary, remains of filaments and loculicules. Pedicelled spikelet, 10, lower glume; 11, upper glume; 12, lower valve. Except fig. 1, all enlarged.
Urelytrum squarrosum, Hack.
Andropogon hirtiflorus, Kunth. var. semiberbis, Stapf.
Andropogon (Linn.)

The genus Andropogon includes many species, chiefly inhabiting tropical and sub-tropical regions. According to the Genera Plantarum, Vol. 3, there are "scarcely 100 species," while in the Flora Capensis, Vol. vii., page 334, it is stated that it consists of over "200 species in the warm parts of the world," but as the author, Dr. Stapf, says, "The genus as defined by Hackel consists of very heterogeneous elements, and I have no doubt that several of the old genera of which it is made up will have to be restored, as, for instance, Chrysopogon, Cymbopogon and Heteropogon," the difference between these two statements of numbers of the species is thus accounted for. The species of which the genus is at present composed differ very much in habit and utility, some being considered as excellent pasture and fodder grasses, others as A. Sorghum, being cultivated for their seeds, which are used as food; A. saccharatus, from whose culms syrup is made; A. muricatus and A. Nardus, from which species an essential oil is distilled, A. muricatus being the well-known "Khus-Khus" grass. Information as to the value of the Natal species is not readily obtainable, but such as I am able to get will be included under the descriptions of the different species.

PLATE 111.

Andropogon hirtiflorus (Kunth. Rév. Gram. ii. 569, t. 198) var. semiberbis (Stapf)

Perennial, tufted. — Culms 1-3 feet long, glabrous, more or less branched or almost simple. Sheaths tight, glabrous or hairy, particularly near the mouth. Ligules membranous, short, glabrous. Blades linear, acute, 2-12 inches long, 1-2 lines wide, folded, firm, smooth except the margins, glabrous or hairy near the base, glaucous or reddish, the uppermost very much reduced or suppressed. Peduncles never more than one from each sheath, the lateral generally exserted.

Racemes slender, stiff, 2-5 inches long, joints up to 20, 3-3½ lines long, with white silky hairs at the base, or more or less ciliate along the edges. Pedicels slightly shorter, ciliate along one or both edges. Sessile spikelets linear, 3½-4 lines long. Glumes, lower bicuspitate, coriaceous, sub-convex, smooth and often shining, keels scaberulous, intracarinal nerves 2-5; upper chartaceous, 3-nerved, margins ciliate, keel narrowly crested above. Valves, lower lanceolate, 2-nerved, ciliate; upper bifid beyond the middle, 1-nerved, lobes ciliate. Awn 5-8 lines long, lower twisted portion scarcely exserted. Pale very minute, or none. Pedicelled spikelets barren, 1½-2½ lines long, middle and carinal nerves strong, often with a fine awn from the mucros. Valves hyaline, 3-1-nerved or suppressed.

Habitat: Natal. Umpumulo, Buchanan 199; Zululand, Jenkinson 41.

Drawn from Jenkinson's specimen, and compared with Buchanan's 199, but the pale in the perfect spikelet and valves in the barren one have not been found.

Fig. 1, Plant about natural size; 2, joint of rachis; 3, sessile and pedicelled spikelets. Sessile spikelet—4, lower glume, back view; 4a, same, front view; 5, upper glume, side view; 6, lower valve; 7, upper valve; 8, stamen, pistil and lodicules. Pedicelled spikelet—9, lower glume, front view; 10, upper glume, side view. Except fig. 1, all enlarged.
PLATE 112.


A perennial tufted grass.—Culms erect or ascending, very slender, 1-4 feet long, glabrous, smooth, many-noded, simple below, branched above, branches solitary or 2-4-nate, often sub-pendulous, filiform, with bearded tips; collected into a spathaceous raceme or panicle. Sheaths terete, tight, glabrous or hairy to villous, shorter than the internodes. Ligules very short, rounded. Blades linear, tapering to an acute point, 2-6 inches by 1-2 lines, flat, erect, somewhat firm, glabrous or hairy, turning red, midrib white. Spathes boat-shaped, acuminate, \( \frac{3}{4} \) inch long, membranous, reddish, glabrous, many-nerved.

Racemes about 7-8 lines long, shortly peduncled, surrounded by the spathe, except the pedicelled spikelets. Joints 6-8, filiform, villous above, about \( \frac{3}{4} \) line long. Pedicels similar, finer, villous all along.

Spikelets oblong, yellowish green or brown, hairy or glabrous and shining on the back, the sessile 1\( \frac{1}{2} \)-2 lines long. Glumes, lower chartaceous, narrowly truncate, intracarinal nerves 2, evanescent below; upper membranous below, hairy above, 3-nerved, tips generally awned. Valves, lower lanceolate-oblong, faintly 2-nerved, margins softly ciliate; upper oblong-linear, bifid, almost 1\( \frac{1}{2} \) line long, 1-nerved, lobes very narrow, glabrous. Awn fine, about 5-7 lines long, knedd below the middle. Pale very minute. Anthers 1 line long. Grain oblong, dorsally slightly compressed. Pedicelled spikelets obtuse, about 2 lines long. Glumes, lower 7-9-nerved, nerves unequal; upper 5-nerved. Valves, lower 3-nerved, ciliate; upper very narrow, linear, nerveless, awnless. Pale none.

Habitat: Natal. All over the colony, Buchanan 224, 225; Berea, Wood 5932; Drakensberg, Wood 5994; Dundee, W. E. Green 83; Zululand, Jenkinson 65.

Drawn from the specimens sent by Jenkinson, and compared also with Buchanan's and Wood's specimens.

From comparison of the different specimens we find that the indument of the spikelets and the nervation of the valves is very variable. In Jenkinson's specimen the villous hairs are almost absent, except on the rhachis. This grass is said to be eaten by cattle, but is of little value.

Fig. 1, Plant about natural size. Sessile spikelet—2, lowest glume; 3, upper glume; 4, lower valve; 5, upper valve; 6, stamens, stigma, ovary, and lodicules. Pedicelled spikelet, 7, lower glume; 8, upper glume; 9, lower valve, and rudimentary ovary. Except fig. 1, all enlarged.
Andropogon ceresiaeformis, Nees.
Andropogon eucomus, Nees.
PLATE 113.


Perennial, densely tufted.—Culms slender, 1 to 3 feet long, glabrous, 4 to 6 or more noded, simple to or beyond the middle, then distantly branched. Branches long, very slender, solitary or 2-3-nate, simple or again branched.

Leaves mainly basal. Sheaths shorter than the internodes, glabrous or hairy near the mouth, rarely lower down, the lower compressed, keeled, the upper distant, sub-tumid. Ligules membranous, very short, truncate, ciliolate. Blades linear, acute, folded, 3 inches to 1 foot by 1-1½ lines long (unfolded), glabrous or hairy, pale green. Spatha linear, setaceously acuminate, glabrous, 2 inches long, usually exceeding the filiform glabrous peduncle.

Racemes 2-4-nate, 1-1½ inch long, very slender, flexuous, sub-erect or nodding, silvery plumose, joints filiform, shorter than the spikelets, silky with soft long (about 5 lines) hairs. Pedicels similar, exceeding the spikelets, barren.


Habitat: Natal. Abundant on coast flats, Buchanan 211; Durban Flat, Buchanan 26, Wood 1654; Zululand, Jenkinson 16; Dundee, Green 32a; near Durban, Wood 6004.

Figured from Wood’s 6004 and 1654, compared with Green’s and Jenkinson’s specimens.

Fig. 1, Plant about natural size; 2, rhachis with sessile, and rudimentary pedicel of upper spikelet; 3, lower glume; 4, upper glume; 5, lower valve; 6, upper valve; 7, pale; 8, ovary, style, stigmas, stamens and lodicules. Except fig. 1, all enlarged.

Perennial, densely tufted.—Culms erect, 2-3 feet long, glabrous, compressed or terete, 5-6-noded, simple below, remotely branched from the upper 2-3 nodes, branches solitary, long, straight, glabrous.

Leaves mostly crowded near the base. Sheaths glabrous or bearded at the mouth, lower very firm, strongly compressed, keeled and persistent, upper shorter than the internodes, tight, uppermost sub-spathaceous. Ligules membranous, very short, truncate, ciliolate. Blades linear, acute, usually folded, lower 4-12 inches by 1-2½ lines (unfolded), uppermost very short or obsolete, rigid, glabrous, or hairy at the base, acutely keeled, margins scabrous.

Peduncles generally long exserted, glabrous. Racemes 2-8, fascicled, unequal, 1½-4 inches long, flexuous, slender, loose; joints 2-3 lines long, thicker upwards, hairy on the convex back, or only along the margins, hairs white, particularly above, tips sub-erumpent with irregularly toothed margins. Pedicels similar, more slender, produced into a subulate appendage facing the upper glume. Sessile spikelets lanceolate, 3-3½ lines long, often purplish. Glumes sub-coriaceous to chartaceous, glabrous; lower acute or acuminate, dorsally concave, keels acut, scabrid, or rigidly ciliate, callus scantily bearded; upper boat shaped, 1-nerved. Valves, lower oblong-lanceolate, faintly 2-nerved, softly ciliate; upper 2 lines long, bifid to middle. 1-nerved, lobes very narrow, ciliate. Awn 5-7 lines long, kneed below the middle. Pale half line long, ciliate. Anthers 1 line long. Pedicelled spikelets, male, narrowly lanceolate, 3-3½ lines long, purplish, glabrous. Glumes, lower acuminate, with a median keel in the upper part; upper 1-nerved, resembling the entire lanceolate, muticos, reversedly ciliate valves.

Habitat: Natal. Durban Flat, Buchanan 41; Riet Vlei, Buchanan 192; Umpumulo, Buchanan 191; Mooi River, Mason 29, 45; Zululand, Jenkinson 48; Dundee, Green 70, 76; near Durban, Wood 6049; Zululand, Swanfield.

Valuable as food—"Blaauw-Gras." (Mr. Celliers, per Mr. W. E. Green.)

Fig. 1, Plant about natural size. Sessile spikelet—2, lowest glume, back view; 2a, same, front view; 3, upper glume; 4, lowest valve; 5, upper valve; 6, pale; 7, stamens, style, stigmas, ovary, and lodicules. Pedicelled spikelet—8, lowest glume; 9, upper glume; 10, rhachis of spikelet. Except fig. 1, all enlarged.
Andropogon appendiculatus, Nees.
Andropogon schirensis Hochst var. angustifolia Stapf.
PLATE 115.

Andropogon schirensis (Hochst. ex Rich. Tent. Fl. Abyss. ii. 456)
var. angustifolia (Stapf).

Perennial, tufted.—Culms erect, slender; 2-3 feet long, glabrous, 3-4-noded, simple, rarely with an additional flowering branch from one of the uppermost nodes.

Leaves mainly crowded near the base. Sheaths terete, tight, glabrous, lowest more or less persistent. Ligules membranous, very short, truncate. Blades narrow, linear, tapering to a fine, sometimes setaceous point, 4-7 inches by 1 rarely 2 lines, rather firm, glabrous, rarely hairy below, margins scabrid.

Racemes 2-nate, rarely solitary, rather slender; 2-3½ inches long, strict or subflexuous. Joints and pedicels very similar, cuneate-linear, 2-3 lines long, tips deeply hollowed and produced into a short irregularly toothed appendage, long ciliate along the margins. Sessile spikelets strongly laterally compressed, wedged in between the pedicel and the joint, 2½-3 lines long; callus slender, pungent, densely bearded, 1 line long, sunk in the hollow of the preceding joint. Glumes subcoriaceous or chartaceous, glabrous, smooth; lower linear, subacute, keels narrow, with a deep narrow groove (fold) between them, scaberulous above: upper boat-shaped, finely mucronate, 1-nerved. Valves, lower oblong-linear, obtuse, 2-nerved, ciliate: upper deeply bifid, 1-nerved, lobes lanceolate, acute, ciliolate. Awn ⅔-1½ inch long, slender, kneeed and pubescent below the middle. Pale oblong, 1½ line long, nerveless or sub-2-nerved. Anthers 1 line long. Pedicellate spikelets male, dorsally compressed, 4-5 lines long, often reddish or purple. Glumes subherbaceous, acuminate, glabrous; lower acutely 2-keeled, keels scabrid or rigidly ciliate above, intracarinal nerves 8; upper linear-lanceolate, 3-nerved, ciliate. Valves, lower as in the sessile spikelets; upper linear, shortly 2-toothed, muticous. Pale linear, 1-1½ line long.

Habitat: Natal. Umpumulo, Buchanan 195; Riet Vlei, Buchanan 193, 196; and without precise locality, Buchanan 116, partly; near Dundee, Green, 92.

Figured from Green’s specimen.

Fig. 1, Plant reduced. Pedicellate spikelet—2, lower glume, front view; 3, same, back view; 4, upper glume, front view; 5, upper valve, front view; 6, pale; 7, stamens and lodicules. Sessile spikelet—8, upper valve; 9, lower glume, back view; 10, same, front view; 11, upper glume, side view; 12, lower valve, front view; 13, stamens, ovary, stigmas, and lodicules; 14, pale; 15, portion of rhachis. Except fig. 1, all enlarged.

Perennial, densely tufted.—Culms erect, slender, 2-2½ feet long, glabrous, 3-5-noded, simple or with 1-3 flowering branches from the upper nodes.

Leaves mostly crowded at the base. Sheaths terete, tight, glabrous, lowest widened, sub-persistent; ligules membranous, short, truncate or rounded. Blades linear, tapering to a long setaceous point, broad, rounded at the base, or subcordate and subamplexicaul, 4-8 inches long, 3-5 lines wide, flat or convolute above, rather firm, glabrous, margins scabrid.

Racemes 2-nate, rather slender, 2-3½ inches long, strict or subflexuous; joints and pedicels very similar, sublinear, 3 lines long, shortly ciliate along the margins, tips hollowed, denticulate. Sessile spikelets laterally compressed, wedged in between the pedicel and the joint, 3½-4 lines long, glabrous, callus short, acute, bearded, sunk in the hollows of the preceding joint. Glumes coriaceous, lower linear-lanceolate, acuminate, 2-toothed, keels rounded and broad below, acute and scabrid near the tips, with a distinct groove (fold) extending between them to the acumen, and with 2 fine lateral furrows in the upper third; upper 1-nerved, mucronate or aristulate. Valves subequal; lower lanceolate, 3-nerved, softly ciliate; upper linear-lanceolate, deeply bifid, lobes lanceolate, ciliate. Awn stout, 1½-2 inches long, knedd and pubescent below the middle. Pale linear-oblong, 1½ lines long, nerveless, ciliate. Anthers 2½ lines long. Pedicelled spikelets male, dorsally compressed or subterete, lanceolate, 5-6 lines long. Glumes subherbaceous, acuminate, often aristulate; lower acutely 2-keeled, keels scabrid or rigidly ciliate above, intracarinal nerves many (to 19), middle nerve stronger; upper linear-lanceolate, 3-sub-5-nerved, ciliate. Valves linear, 3-nerved; lower acuminate, 4½ lines long, ciliate; upper 3½ lines long, 2-toothed, muticous. Pale linear, 2 lines long, nerveless.

Habitat: Natal. Umpumulo, Buchanan 194; Gervard 769; Buchanan 116, partly: near Maritzburg, St. George 33.

Fig. 1, Plant about natural size; 2, joint of rhachis. Pedicelled spikelet—3, lower glume, front view; 4, upper glume, front view; 5, upper valve, front view; 6, pale. Sessile spikelet—7, lower glume, back view; 8, upper glume, side view; 9, lower valve, front view; 10, upper valve, front view; 11, stamens, stigmas and lodicules; 12, pale. Except fig. 1, all enlarged.

Note.—The upper valve of pedicelled spikelet is 2-toothed, not mucronate as shown in the drawing.
Andropogon amplectens, Nees.
Andropogon filifolius, Steud.
PLATE 117.


PERENNIAL, densely tufted.—CULMS erect, slender, 1-2½ feet long, glabrous, terete, about 3-noded, simple.

LEAVES mainly crowded at the base. Sheaths shorter than the internodes, terete, tight, glabrous, lowest persistent, at length breaking up into fibres; ligules membranous, very short, truncate. Blades very narrow, convolute, filiform, acute, lowest ½-1 foot long, upper very short, firm, flexuous, glabrous or hairy at the base.

Racemes 2-nate, 2½-3½ inches long, stout, strict; joints and pedicels subequal and similar, cuneate-linear, 2½-3½ lines long, densely and shortly villous along the margins, tips hollowed, unequally toothed. Sessile spikelets laterally compressed, wedged in between joint and pedicel, 3½ lines long; callus slender, 1½ line long, acute, densely bearded. Glumes subcoriaceous, glabrous, smooth; lower linear, obtuse, tips hyaline, keels narrow, rounded, smooth, almost contiguous, with a deep very narrow groove (fold) between them; upper boat-shaped, 1-sub-3-nerved, ciliate. Valves subequal; lower oblong-linear, 2-nerved, ciliate; upper linear deeply bifid, 3-nerved, lobes oblong, ciliolate. Awn stout, 2-2½ inches long, kneeed at the middle, pubescent below. Pale ovate, acute, ½ line long, nerveless, glabrous. Anthers 2½ lines long. Pedicelled spikelets male, dorsally compressed or subterete, lanceolate, 6-8 lines long, glabrous, often purplish. Glumes, lower herbaceous, 2-toothed, one tooth often prolonged into a bristle (to 3 lines long), acutely 2-keeled, intracarinal nerves many (to 20); upper finely acuminate, 3-nerved, ciliate. Valves, lower linear-oblong, acute, 4 lines long, 3-2-nerved, ciliate; upper linear, 1-nerved glabrous, muticous. Pale linear, 2 lines long, nerveless. Anthers ½ lines long.

Habitat: Natal. Riet Vlei, Buchanan 197; near Newcastle, Buchanan 195.

Figured from Buchanan's 197, which is the only specimen in the Natal Government Herbarium. Buchanan's 195 is also in the Herbarium, but the portion of it that we have proves to be wholly A. schirensis. Stamens and pistil were not found in the specimen from which the artist drew the figure, and could not therefore be shown in the drawing, and this species has not been sent by any contributor.

This plant has been gathered in Cape Colony and Transvaal, but apparently is not very common in Natal.

Fig. 1, Plant about natural size. Pedicelled spikelet—2, lower glume; 3, upper glume; 4, lower valve; 5, upper valve; 6, pale. Sessile spikelet—7, lower glume, back view; 7a, same, front view; 8, upper glume; 9, lower valve; 10, upper valve; 11, pale. Except fig. 1, all enlarged.
PLATE 118.


Perennial. — Culms erect or ascending, usually simple, to 5 feet long, rather stout.

Sheaths glabrous except the sometimes appressedly hairy nodes, terete, tight, longer than the internodes, or the upper shorter; ligules very short, truncate, often with hairs from behind. Blades linear, tapering to a long fine point, 4-30 inches long by 1 1/2-4 lines wide, rather rigid, glabrous or sometimes hispid at the base, usually smooth except the margins.

Panicle compound, oblong, dense, 4-7 inches long; usually purplish, common rachis, 2-5 inches long; branches like the short peduncles glabrous, except for the bearded axils. Racemes slender, often flexuose, joints and pedicels about half the length of the spikelets or slightly longer, ciliate, cilia usually shorter than the joint. Sessile spikelets linear-oblong, 1 1/2-1 3/4 line long, purplish, callus minutely bearded. Glumes, lower rather thin, slightly truncate, pitted, glabrous or more or less hairy below the middle, intracarinal nerves faint, 4-7, keels spinulously ciliate above, rarely smooth; upper acute or sub-acute, 3-nerved, scantily ciliate or glabrous. Valves, lower oblong, sub-obtuse, nerveless, glabrous; upper almost reduced to a very slender kneeed awn, 5-7 lines long. Pedicelled spikelets male or barren, usually not pitted, sometimes reduced to the glumes.

Habitat: Natal. Banks of Umlaas River, Drège; Umpumulo, Buchanan 295; without precise locality, Queinzius; Umhlanga, Wood 6061.

Figured from Wood's specimen.

Wood's No. 6061 was sent to Professor Hackel, who named it A. punctatus, Roxb., but the Flora Capensis quotes the plant as a variety of A. intermedius, R. Br., which is a native also of Tropical Asia and Australia.

Fig. 1, Plant natural size; 2, rachis with sessile and pedicelled spikelets. Sessile spikelet—3, lower glume, back view; 3a, same, front view; 4, upper glume; 5, lower valve; 6, upper valve; 7, stamens, pistil and lodicules. Pedicelled spikelet—8, lower glume; 9, upper glume. Except fig. 1, all enlarged.
Andropogon intermedius, R. Br. var. punctatus. Hack.
Andropogon halensis Brot. var. effusus, Stapf.
PLATE 119.

Andropogon halepensis (Brot. Fl. Lusit. i. 89), var. effusus (Stapf in

Perennial, stoloniferous?—Culms erect, usually very tall, up to 10-16 feet
long, stout, simple or scantly branched. Sheaths glabrous, except the minutely
silky nodes, strongly striate; ligules membranous, short, ciliate, hairy inside.
Blades linear-lanceolate, or linear from an often rounded base, long tapering to a
fine point, 1-2 feet long, 3-2½ inches broad, flat, glabrous, or with a silky line on
the back at the union with the sheath, margins serrulate, midrib stout.

Panicle decompound, very large, up to 1½ foot long, effuse, nodding, lower
branches up to 1 foot long, often undivided to the middle. Rhachis and branches
or at least the ultimate branchlets scabrid and minutely bearded at the nodes.
Racemes ½-2 inch long; linear; joints 3-7, more than half as long as the sessile
spikelets, more or less ciliate; pedicels very similar. Sessile spikelets ovate-lanceo-
late, 3-4½ lines long, 1-1½ line broad, pale, ultimately sometimes darker or even
black, shining. Glumes, lower more or less hairy, at least on the sides, 7-13-nerved,
callus shortly bearded; upper lanceolate, acuminate, shining, 5-7-nerved. Valves,
upper broadly oblong or ovate, 2-lobed, half as long as the glumes, ciliate, 1-nerved.
Awn 4-6 lines long, rarely longer, knedd, sometimes reduced to a bristle, or sup-
pressed. Pale linear-oblong, slightly shorter than the valve. Anthers 1½-½ line
long. Grain obovate or obovate-oblong, ½ shorter than the glumes. Pedicelled
spikelets almost as long as the sessile but narrower, male or barren. Glumes, lower
herbaceous, glabrous, 5-9-nerved, kee’s aculeolate or scabrid; upper similar,
3-5-nerved. Valves, when present hyaline, ciliate, 2-1-nerved.

Habitat: Natal. Near Durban, Drége; banks of Tugela River, Buchanan
296; Umlas River, Krauss 184; Umhlanga, Wood 1332, 6064; without precise
locality, Gerrard 690; Zululand, Jenkinson 51.

Figured from Wood’s 6064, and compared with Jenkinson’s specimen.

Baron F. v. Mueller says of this grass: “Attains a height of 5-6 feet. Not
easily repressed in moist ground. A rich perennial grass, often cultivated under
the name of ‘Cuba grass’ and ‘Johnson grass.’ It keeps green in the
heat of summer and is also a winter grass in frost-free localities, is not eaten out
by pasture animals; it will also grow in drift sand of the coast, and will keep
growing in the dry season, when most other grasses fail, but improves much on
irrigation; the roots resist some frost; three tons can be cut from an acre in a
single season. It yields so large a hay crop that it may be cut half a dozen times
in a season should the land be rich. All kinds of stock have a predilection for this
grass. Much overlooked in its importance for fixing loose soil on embankments.
It will mat the soil with its deep and spreading roots, hence it should be kept from
cultivated fields. Detrimental to Lucerne in meadows.” Our p’ant is a variety of
the grass of which Baron v. Mueller writes.

Fig. 1, Plant about natural size; 2, rhachis and spikelets. Pedicelled spikelet—3, lower
glume; 4, upper glume; 5, upper valve; 6, lower valve; 7, pale and lodicules. Sessile
spikelet—8, stamens and pistil. Except fig. 1, all enlarged.
PLATE 120.

Andropogon Sorghum (Brot. Fl. Lusit. i. 88).

Annual.—Leaves as in A. halepensis, but the ligule often glabrous or glabrescent.

Panicle very variable, from effuse to compact. Rhachis of racemes tough, joints and pedicels half as long as the sessile spikelets, or very often much shorter, more or less ciliate. Sessile spikelets very variable in shape and size, on the whole broader than in A. halepensis, 2-3½ by 1¼-2½ lines, pale, reddish, brown or at length black, usually shining. Glumes, lower coriaceous, or more or less herbaceous, particularly towards the tips, rarely quite thin, except at the base, often prominently nerved in the herbaceous part, hairy, rarely quite glabrous, otherwise as in A. halepensis. Awn 2½-7½ lines long, more or less reduced or 0. Grain obovate to globose. Pedicelled spikelets male, or more frequently barren, and more or less reduced.


Figured from Wood's specimen.

This is the Kafir Corn or "Amabele" of the natives, and the specimen from which the drawing was made is probably an escape from native cultivation. There are some 7 varieties of the plant in tropical and South Africa, and it is stated in Flora Capensis, Vol. vii., Part 2, page 348, that this specimen most likely belongs to the variety usorium, but more ample material is required to distinguish clearly between the different varieties. The one here figured is the only specimen in the Government Herbarium. It is, I think, generally believed that this plant is the cultivated form of A. halepense, and its varieties and synonyms are very numerous. Professor Hackel enumerates in the Flora of British India 7, while Dr. Stapf, in the same work arranges them in 9 varieties (including many of the African ones). Good sets of the different varieties cultivated by the natives in Natal are very desirable.

Fig. 1, Leaf and inflorescence, natural size. Sessile spikelet—2, lower glume, front view; 2a, same, back view; 3, upper glume; 4, lower valve; 5, upper valve; 6, pale and lodicules; 7, ovary and stigmas. Except fig. 1, all enlarged.
Andropogon Sorghum Brot, var. usorun, Korn.
Andropogon contortus, Linn.
PLATE 121.

ANDROPOGON CONTORTUS (Linn. Spec. Plant. 1045).

PERENNIAL.—Culms erect, stout, simple or branched from the upper nodes, often sheathed all along, 1-3 feet long. Sheaths compressed, keeled, glabrous; ligules short, truncate, ciliolate. Blades linear, acute or tapering to a long fine point, 3-8 inches long, by 1½-3 lines wide, flat or channelled, rigid, scabrid, especially above, sparingly hairy at the base or all over.

Racemes 1½-3 inches long, straight or curved, rachis tough between the lowest 2-6 pairs, the spikelets of which are male and like the pedicelled of the upper pairs, joints very short, unequally bearded. Sessile spikelets of the heteromorphous pairs, female, 3-3½ lines long, callus 1½ line long, rufous bearded. Glumes, lower linear-oblong, truncate, shortly hairy, obscurely nerved; upper membranous, 3-nerved. Awn stout, 3½-7 inches long, rufous hairy below. Male spikelets obliquely lanceolate, 4-5 lines long, dull green. Glumes, lower herbaceous, sub-obtuse, glabrous or hirsute with tubercle based hairs, many nerved, keels unequally winged; upper 3-nerved. Valves, lower minute; upper suppressed. Anthers 1½ line long.

Habitat: Natal. Umsinga and base of Biggarsberg, Buchanan 91; near Maritzburg, December, St. George 3 (Wood 7244).

Figured from St. George’s specimen.

In the Flora Capensis, Vol. vii., p. 351, a plant collected by Buchanan in O. F. State, and numbered 233, is said to be this plant, but Buchanan’s 233 in the Government Herbarium, is a Brachypodium. In the specimen examined we find in the pedicelled spikelets of the heteromorphous pairs, and in both spikelets of the homogamous pairs, that the upper valve is hyaline and 1-nerved, and the pale equals the lodicules in size. The glumes of the pedicelled spikelets of both pairs, and of the sessile spikelets of the homogamous pairs, are quite glabrous.

Fig. 1, Plant about natural size. Sessile spikelet—2, lower glume, back view; 2a, same, front view; 3, upper glume, front view; 3a, same, side view; 4, lower valve; 5, upper valve; 6, ovary and stigmas. Pedicelled spikelet—7, lower glume, front view; 8, upper glume, front view; 9, lower valve; 10, upper valve with lodicules, pale and stamens. Except fig. 1, all enlarged.
PLATE 122.


Perennial, densely tufted, innovation shoots intravaginal.

Culms slender, erect, 4-7 feet long, glabrous, smooth, stout, simple and 4-5-noded below the spurious panicle, longest internodes often 1 foot long, or longer.

Leaves mainly crowded near the base. Sheaths tight, glabrous, except the lowermost, which are fugaciously hairy to tomentose at the very base, and 9-12 inches long, very firm and persistent, the upper 1-2, much shorter than the internodes; ligules very firm, rounded, up to 2-3 lines long. Blades narrow, linear, very long, tapering to a fine point, 2 feet long, by \(2\frac{1}{2}-4\frac{1}{2}\) lines wide, flat, rigid, glabrous, margins scabrid.

Panicles more or less compound, spathaceous, usually narrow, 6-12 inches long, with a distant flowering branch below it. Racemes \(\frac{1}{2}-\frac{3}{4}\) inch long, finally deflexed or horizontally spreading, subtended by lanceolate, boat-shaped, many nerved, scarious, often reddish spathes 7-9 lines long, on slender common peduncles, which are 4-8 inches long; joints and pedicels linear, slender, about 1 line long, densely hairy along the margins, tips cupular, irregularly toothed. Spikelets of the lowest pair of the sessile raceme male, like the pedicelled ones; the sessile of all the other pairs perfect. Perfect spikelets lanceolate, \(2\frac{1}{4}-2\frac{1}{2}\) lines long, reddish above. Glumes, lower sub-chartaceous, minutely 2-toothed or subacute, dorsally flattened, or slightly depressed, glabrous, keels widened above into narrow or broad, often serrulate, scarious wings, intracarinal nerves 2-4, unequal, evanescent below; callus short, minutely bearded; upper lanceolate, acute or mucronate, 1-nerved, glabrous, keel narrowly winged. Valves hyaline, lower lanceolate-linear, \(1\frac{1}{2}-2\) lines long, ciliate; upper linear, very narrow, bifid, \(1\frac{1}{2}-1\frac{3}{4}\) line long, 1-nerved, lobes fine, ciliate. Awn slender, 6-7 lines long, kneed at or below the middle, glabrous below. Pale 0. Anthers 1 line long. Grain \(1\frac{1}{4}\) line long. Pedicelled spikelet male, lanceolate acute, \(2\frac{1}{2}\) lines long. Glumes, lower many nerved; upper 3-nerved, keels of both scabrid. Valves, lower linear, obtuse, nerveless or 2-nerved at the base, \(1\frac{1}{4}\) line long; upper 0. Pale 0.

Habitat: Natal. Near Durban, Williamson 52; Krauss 87; Inanda, Wood 1622; near Maritzburg, Rehmann 7600; Dundee, Green 72.

A. Nardus is a very variable species; the type is Indian, and has not been found in South Africa, but we have 3 varieties viz., marginatus (Hack.), prolixus (Stapf), and validus (Stapf). We find that these varieties run very closely together, so that it is often difficult to distinguish between them. Specimens from Mr. Green, 114 and 87, and Mr. Swanfield's without number, are probably near to the variety marginatus. The Flora of British India describes 9 varieties, none of which appear to be identical with the African ones.

Fig. 1, Culm, upper portion, leaves and inflorescence; about natural size: 2, spathe and 2-nate racemes; 3, joint and pedicel. Sessile perfect spikelet—4, lower glume; 5, upper glume; 6, lower valve; 7, upper valve; 8, stamens, pistil and lodicules. Pedicelled spikelet—9, lower glume; 10, upper glume; 11, lower valve. Except fig. 1, all enlarged.
Andropogon Nardus, Linn var validus, Stapf.
Andropogon plurinodis  Stapf.
PLATE 123.


Perennial, compactly tufted; innovation shoots intravaginal.

Culms slender, erect, 1-3 feet long, glabrous, smooth, simple below, 4-6 (rarely 3) noded, longest internode 6-10 inches long, rarely longer. Sheaths tight, shorter than the internodes except the lowermost, which are fugaciously hairy to tomentose at the very base, 1 1/2-3 inches long, firm and persistent, the upper usually much shorter; ligules firm, very short, up to 1 line long, rounded. Blades very narrow, linear, filiform or setaceous in the upper part, 4-8 inches long, by 1-1 1/2 line broad, flat or partly folded, rather rigid below, flexuous above, glabrous, glaucous, margins scabrid.

Panicles narrow, rather lax, usually scantily branched, 3-6 inches long. Racemes 3/4-1 inch long at length horizontally spreading or deflexed on slender peduncles, which are 3-5 lines long and subtended by lanceolate, acuminate, many nerved, scariosus, reddish spatheS, 3 1/4-1 1/4 inch long; joints and pedicels linear, slender, 1-1 1/2 line long, densely hairy along the margins, tips cupular, irregularly toothed.

Spikelets of the lowest pair of the sessile raceme alike, male, of the sessile of all the other pairs perfect, the pedicelled male. Perfect spikelets very narrow, lanceolate, acute, 3 lines long. Glumes, lower chartaceous, acute, or 2-toothed, more or less concave between the keels which are rounded and smooth near the base, obscurely winged and scabrid towards the reddish or purplish tips, intracarinal nerves 2-5, the middle one or all evanescent below; upper sub-chartaceous, lanceolate, acute, 1-nerved, glabrous (ciliate in our specimen). Valves hyaline; lower linear, 2-2 1/2 lines long, ciliate; upper slightly shorter, linear-oblong to linear, deeply bifid, lobes lanceolate to subulate. Awn slender, 5-8 lines long, kneed at or below the middle. Pale 0. Anthers 1 1/2 line long. Pedicelled spikelets dorsally compressed, lanceolate, acuminate, 3-3 1/2 lines long, purplish. Glumes, lower many nerved, keels scabrid; upper 3-5-nerved, with or without a median keel. Valves, lower linear-lanceolate, 2 1/2 lines long, 2-nerved, ciliate; upper 0. Pale 0.

Habitat: Natal. On Tugela River near Colenso, Rehmann 7158; Biggarsberg, Rehmann 7112; Mooi River, April, Wood 4318.

Figured from Wood's 4318.

This plant was formerly known as, or confused with A. marginatus, but has been separated as above, by Dr. Stapf, in Flora Capensis.

Fig. 1. Plant about natural size. Sessile perfect spikelets—2, lower glume, back view; 2a, same, front view; 3, upper glume; 4, lower valve; 5, upper valve; 6, pistil, stamens and lodicules. Pedicelled spikelet—7, lower glume, front view; 8, upper glume; 9, lower valve; 10, spathe with 2-nate racemes. Except fig. 1, all enlarged.
PLATE 124.

Andropogon Schœnanthus (Linn. Sp. Plant. 1046), var. versicolor (Hack. Andr. in DC. Monogr. Phan. vi. 610).

Perennial, frequently with extravaginal innovation shoots, besides some intravaginal ones, or annual (or at least flowering the first year).

Culms fascicled, erect or shortly ascending, stout or rather so, 2-4 feet long, simple and 4-7-noded below the spurious panicle. Sheaths tight, quite glabrous, subherbaceous, or the lowermost firmer, and sometimes subpersistent, 2-3 inches long; upper shorter than the internodes; ligules very short, rounded. Blades linear to linear-lanceolate from a broader rounded or subcordate base, tapering to a long setaceous point, ½-1 foot long, by 3-6 lines wide (in the South African specimens), flat, rather flaccid, dull green or sub-glaucous, glabrous, smooth or the margins scabrid.

Panicles more or less compound, narrow, often interrupted, 4-6 inches long, rarely longer. Racemes 4-9 lines long, 2-nate, at length reflexed or horizontally spreading, on slender peduncles which are 2-4 inches long, and subtended by lanceolate boat-shaped, many-nerved scarious reddish spathes, ½-1 inch long; joints and pedicels linear; slender, or the lowest somewhat stout, 1-1 ½ line long, densely hairy, mainly along the margins, tips minutely cupular, toothed. Spikelets of the lowest pair of the sessile raceme alike, male, the sessile of all the other pairs perfect, the pedicelled male. Perfect spikelets lanceolate, 2-2 ½ lines long, often variegated. Glumes, lower subacute or obscurely 2-toothed, dorsally flattened, with a narrow groove from the middle downward, corresponding to a keel on the inner side, keels narrowly or obscurely winged and scabrid above, evanescent below; upper lanceolate, acute, 1-sub-3-nerved. Valves hyaline, lower oblong, 1 ½ line long, 2-nerved, ciliate; upper scarcely shorter, very narrow, linear, deeply bifid, lobes very fine. Awn 5-7 lines long, slender, bent just below the middle, glabrous below the bend. Pale 0. Anthers 1 line long. Pedicelled spikelets oblong subacute, 2 lines long. Glumes, lower 9-11-nerved; upper 3-nerved. Valves lower oblong, almost equalling the glumes, 2-nerved; upper and pale 0. Anthers 1 ½ line long.


Figured from Wood's 7577.

Fig. 1, Plant about natural size; 2, spathe with 2-nate racemes; 3, lower pair of spikelets of sessile raceme. Sessile spikelet—4, lower glume, back view; 5, upper glume; 6, lower valve; 7, upper valve; 8, stamens, stigmas, and lodicules. Pedicelled spikelet—9, lower glume; 10, upper glume; 11, lower valve. Except fig. 1, all enlarged.
Andropogon Schoenanthus, Linn. var versicolor, Hack
Andropogon hirsutus (Linn. Sp. Plant. 1046).

Perennial, tufted; innovation shoots mostly intravaginal.

Culms erect, rather slender, 1-3 feet long, glabrous, simple or more or less branched and 3-6-noded below the panicle, longest internode generally less than ½ foot long. Sheaths tight, glabrous, the lowest crowded, compressed, firm, persistent, the upper terete, shorter than the internodes; ligules oblong, obtuse, up to 1½ line long. Blades narrow, linear, tapering to a long fine point, 4 inches to more than 1 foot long, by 3/4-1½ line wide, glabrous, finely scaberulous, more or less glaucous, turning reddish, midrib white.

Panicle spathaceous, lax, contracted, sometimes reduced to a few simple branches; 6 inches to more than 1 foot long. Racemes 3/4-1½ inch long, silvery villous, on very slender, usually nodding, pubescent or villous, rarely glabrous peduncles, which are 1-3 lines long, and more or less exserted from the long, very narrow, finely acuminate, glabrous or scantily hairy, reddish spathes; joints filiform, obliquely truncate, up to 2 lines long, densely ciliate. Pedicels very similar, often produced (in the South African species) into a linear or subulate appendage facing the upper glume. Spikelets of the lowest pair of the sessile raceme alike, male, the sessile of all the other pairs perfect, the pedicelled male. Perfect spikelets linear-oblong, 2-3 lines long, pale or purplish. Glumes, lower chartaceous, minutely truncate, dorsally flattened, villous, keels obscure except close to the membranous reddish tips, intracarinal nerves about 5, evanescent below; upper lanceolate-oblong, obtuse, mucronate, 3-nerved, margins ciliate, keel hirsute above. Valves, lower hyaline, linear-oblong, obtuse, faintly 2-nerved, softly ciliate; upper very narrow, linear, bifid, about 1½ line long, ciliate, base, margins and lobes hyaline. Awn stout, pubescent, 1-1½ inch long, curved below the middle. Pale very minute or 0. Anthers 3/4-1 line long. Pedicelled spikelets lanceolate, 2½-3 lines long. Glumes, lower herbaceous, 7-11-nerved, mucronate or shortly awned; upper lanceolate-oblong, acute, 3-nerved, softly ciliate. Valves, lower as in the perfect spikelets, but 1-3-nerved; upper linear, ciliate, nerveless, usually much shorter than the lower or obsolete.

Habitat: Natal. Gerrard 670, 674; var. podotrichus, Umpumulo, Buchanan; Riet Vlei, Buchanan; Biggarsberg, Rehmann 7120, 7121; Farkkop, Rehmann 7668; without precise locality, Buchanan 62, 121; near Durban, Wood, 6050

Drawn from Wood's specimen.

Found all over Africa, also in Canary Islands and Madeira.

Peduncles having long tubercle-based hairs occur occasionally in the typical form in the Cape.

Fig. 1, Plant natural size; 2, spathe with 2-nate racemes. Sessile spikelet—3, lower glume, back view; 4, upper glume, side view; 5, lower valve, front view; 6, upper valve; 7, ovary, stamens, and lodicules. Pedicelled spikelet—8, lower glume, front view; 9, upper glume, front view; 10, lower valve, front view; 11, upper valve. Except fig. 1, all enlarged.
Andropogon aechus. Stapf.

Perennial.—Culms erect, robust, up to 2 lines thick, 3-5 feet long, glabrous, simple or more or less branched and 3-5-noded below the panicle, longest internode over ½ foot long. Sheaths tight, glabrous or hairy, the lowest crowded, compressed, subpersistent, the upper terete, shorter than the internodes; ligules oblong, up to ¾ lines long. Blades linear, from a narrow, stouter ribbed base, tapering to a long, fine point, up to ½ foot, by 1-2½ lines broad, glabrous or scantily hairy, glaucous.

Panicle lax, narrow, up to 1½ foot long. Racemes ¾-1½ line long, very villous, on slender, shortly and laterally exserted peduncles, having numerous long tubercle-based hairs near the curvature. Spathes, joints, pedicels and spikelets as in A. hirtus, except for the pedicelled spikelets having a muticous lower glume and subequal valves.

Habitat:—Natal. Riet Vlei, Buchanan 222.

Figured from Buchanan's specimen in the Government Herbarium.

Fig. 1, Panicle, natural size. Pedicelled spikelet—2, lower glume, front view; 3, upper glume, front view; 4, lower valve; 5, upper valve. Except fig. 1, all enlarged.
PLATE 127.

ANDROPOGON RUFUS (Kunth. Enum. i. 492).

PERENNIAL.—Culms erect, stout, 3-8 feet long, glabrous, 5-7-noded below the panicle. Sheaths quite glabrous (in the South African species), or hairy along the upper margins, terete, shorter than the internodes (except the lowest); ligules rounded, 1-2½ lines long, sometimes with hairs from behind. Blades linear from a narrow base, long tapering to a fine point, 1-2½ feet long, by 2-6 lines broad, flat, rigid, erect, glabrous, more or less scabrid, margins very rough, midrib stout, white above.

Panicle usually large and much branched, lax, oblong, contracted or rather open, 1-1½, sometimes to 2 feet long. Spathes very narrow, linear-lanceolate to linear, finely acuminate, 1½-2 inches long, glabrous, scarious, reddish, erect or spreading. Common peduncles finely filiform, pubescent, sometimes with spreading yellowish tubercle-based hairs towards the tips, flexuous or pendulous, more or less (often long) exserted. Racemes slender, ½-1 inch long, not spreading, often drooping; joints 6-10, filiform, obliquely truncate, up to 1 line long, shortly and densely ciliate, lower hairs white, upper reddish; pedicels very similar. Sessile spikelets all perfect, or sometimes the lowest of the sessile raceme like the pedicelled, male, or the latter sometimes barren. Perfect spikelets linear-oblong, 2-2½ lines long, yellowish or reddish. Glumes, lower sub-chartaceous, minutely truncate, dorsally flattened, glabrous or pubescent, with short rather rigid fulvous or ferruginous hairs, or sub-villous, intracarinal nerves about 5, evanescent below, callus shortly bearded, keels rigidly ciliate above; upper membranous, obtuse, 3-nerved. Valves, upper oblong, obtuse, ciliate, faintly 2-nerved; upper shortly bident, 1-nerved, lobes oblong, ciliate. Awn ¼-1 inch long, bent at the middle, pubescent below the bend, minutely scaberrulous above. Anthers 1 line long. Pedicelled spikelets lanceolate-linear, 2¼-2½ lines long, reddish or purplish, glabrous or pubescent to villous. Glumes, lower sub-herbaceous, acute, 7-nerved, keels rigidly ciliate; upper acute, 3-nerved, ciliate. Valves, upper oblong, subacute, 1½ line long, 1-sub-3-nerved; upper narrow, linear, 1-nerved, ciliate, or both valves more or less reduced, or the upper quite suppressed.

Habitat:—ZULULAND. Moist places near Inyezaan River, Wood 3927.

Figured from Wood's specimen, the only one in the Government Herbarium, and no other one appears to have been sent Home from South Africa.

In our specimen the pedicelled spikelets contain the two glumes and a rudimentary lower valve, the upper valve being suppressed. This species is found also in Tropical Africa, the Mascarene Isles, and in Brazil.

Fig. 1, Culm with leaf and panicle, about natural size. Sessile spikelet—2, lower glume, back view; 3, upper glume, front view; 4, lower valve, front view; 5, upper valve with awn; 6, pistil, stamens and lodicules. Pedicelled spikelet—7, lower glume; 8, upper glume; 9, lower valve. Except fig. 1, all enlarged.
Andropogon rufus, Kunth.
Andropogon Dregeanus, Nees.
PLATE 128.


Perennial, compactly tufted.—Culms erect, rather slender, 3-4 feet long, glabrous, shining, about 5-noded below the panicle. Sheaths of innovation shoots compressed, fugaciously tomentose at the base, sheaths of the culms terete, quite glabrous or the upper scantily hairy, smooth; ligules obtuse, up to 2½ lines long, hairy behind. Blades linear from a narrow base, tapering to a fine point, up to 1 foot long, by 2-3 lines broad, erect, rather rigid, flat, glabrous or the uppermost scantily hairy, sub-glaucescent, turning reddish, scabrid, margins spinulose.

Panicle narrow, 1-1½ foot long, remotely branched, contracted. Spathes narrow, lanceolate, acute, about 1½ inch long, scarious, reddish. Common peduncles finely filiform, long exserted, glabrous except the strongly curved or curled tips, which are densely beset with long spreading, yellowish tubercle-based hairs. Racemes ½-1 inch long, lax, scarcely spreading; joints 5-10, filiform, obliquely truncate, up to 1½ line long, shortly ciliate; pedicels very similar. Spikelets of the lowest pair of the sessile raceme alike, male, the sessile of all the other pairs perfect, the pedicelled male, or sometimes with stamens and an apparently perfect pistil. Sessile perfect spikelets linear-oblong, 2 lines long, purplish, pale below. Glumes, lower sub-chaffaceous above, membranous near the base, minutely truncate, dorsally flattened, glabrous or minutely and scantily pubescent or villous, intracrinal nerves about 5, evanescent below the tip; keels rigidly ciliate above, callus shortly bearded; upper membranous, 3-nerved, nerves scabrid above. Valves, lower oblong, obtuse, faintly 2-nerved, ciliate; upper shortly bifid, 1-nerved, lobes oblong, obtuse, ciliate. Awn about 6-8 lines long, very slender, pubescent and knied below the middle. Pale ovate, obtuse, ½ line long. Anthers ¾ line long. Pedicelled spikelets oblong-linear, 2½ lines long, dull purplish; glabrous or hairy. Glumes, lower sub-herbaceous, acute, 9-11-nerved; upper very acute, 3-nerved, long ciliate. Valves, lower linear-oblong, obtuse, equalling the glumes, 3-nerved; upper 1-½ shorter, spathulate-linear from an extremely fine base, sub-1-nerved. Anthers more than 1 line long.

Habitat:—Natal. Between Umtata and St. John's, Drège; between Umzimkulu and Umkomaas Rivers, Drège; near Estcourt, Rehmann 7310; Karkloof, Wylie (Wood 6010).

Figured from Wood's 6010.

Fig. 1, Plant about natural size: 2, ligule. Pedicelled spikelet—5, lower valve: 6, upper valve. Sessile spikelet—3, upper valve: 4, pale. Except fig. 1, all enlarged.
PLATE 129.


PERENNIAL.—CULMS rather slender, erect, over 2 feet long, glabrous, terete, 4-5-noded and simple below the panicle. Sheaths terete or slightly keeled in the upper part, tight, glabrous, shorter than the internodes, except the sub-persistent lowest ones; ligules membranous, rotundate-ovate, ciliolate, up to 1 line long. Blades linear from a rounded base, long tapering to a fine point, over \( \frac{1}{2} \) foot long, by 1\( \frac{1}{2} \)-3\( \frac{1}{2} \) lines broad, glabrous or scantily hairy at the base, scabrid below and along the margins, turning reddish.

PANICLE oblong, about 1 foot long, lax. Spathes very narrow, lanceolate, acuminate, 1\( \frac{1}{2} \)-2 inches long, obliquely erect or divaricate, reddish, glabrous or spreading hairy, particularly below. Common peduncles filiform, more or less curved at the upper end, or at length strict, shortly exserted from near the tip of the spathe or shortly exceeding it, with long, spreading tubercle-based hairs below the tip. Racemes 4-10 lines long, at length horizontally spreading, or deflexed, on very short hirsute peduncles, falling together from the tip of the common peduncle; joints 2-5, filiform, obliquely truncate, 1\( \frac{1}{2} \) line long, shortly ciliate; pedicels very similar. Spikelets of the lowest pair of the sub-sessile raceme alike, barren, the sessile of all the other pairs perfect, the pedicelled barren. Perfect spikelets oblong, lanceolate, 2 lines long, pale. Glumes, lower sub chartaceous above, membranous towards the base, truncate, or minutely 2-toothed, dorsally flattened, scantily pubescent to almost villous, with whitish, or above with reddish hairs, intracarinal nerves 5-7, evanescent below; keels rigidly ciliate above, callus shortly bearded; upper rigidly membranous, obtuse, 3-nerved, ciliate above. Valves, lower oblong, truncate, faintly 2-nerved, ciliate; upper shortly 2-toothed, glabrous. Awn slender, \( \frac{3}{4} \) inch long, kneeling and pubescent below the middle. Pale 0. Anthers \( \frac{3}{4} \) line long. Pedicelled spikelets linear-lanceolate, up to 2\( \frac{3}{4} \) lines long, rufously hirsute. Glumes, lower acuminate, sometimes mucronate, 9-11-nerved; upper 3-nerved, ciliate above. Valves 0, or the lower broadly oblong, up to \( \frac{3}{4} \) line long, ciliate, and the upper reduced to a microscopic ciliate scale.

Habitat:—Natal. Drège 4357; Umpumulo, Buchanan; Biggarsberg, Rehmann 7116; without precise locality, Buchanan 303.

Figured from Buchanan’s specimen in the Government Herbarium.

In the specimen in the Herbarium the panicle is more than 1 foot long.

Fig. 1. Culm, leaf and panicle about natural size. Sessile spikelet—2, lower glume; 3, upper glume; 4, lower valve; 5, pistil, stamens and lodicules; 6, upper valve. Pedicelled spikelets—7, lower glume; 8, upper glume. Except fig. 1, all enlarged.
PLATE 130.

ANDROPOGON CYMBARIUS (Linn. Mant. 11, 303, not Hack.).

Perennial (?).—Culms erect, usually from a very slender and sometimes ascending base, 3-6 feet or more long, often rooting from the lower nodes, terete, glabrous, 6-10-noded, simple or branched. Sheaths glabrous, rarely hirsute with tubercle-based hairs, or villous at the nodes, terete or keeled in the upper part, the lowest whitish, withering or thrown off, the middle and upper usually shorter than the internodes. Ligule membranous, rounded or truncate, very short. Blades linear from a narrow base, long tapering to a fine point, $\frac{1}{2}$ to over $1\frac{1}{2}$ foot, by 3-6 lines, rarely narrower, rigid to subflaccid, flat, glabrous or subhirsute at the base from tubercle-based hairs, scaberulous or smooth except the scabrid or spinulous margins, glaucous.

Panicle leafy, almost overtopped by its blades, linear-oblong, decompound, usually dense, $\frac{1}{2}$-2 feet long. Spathes obliquely ovate, acute or acuminate, 5-9 lines long, scarious, often brilliantly red or purple, glabrous. Common peduncles filiform, enclosed, spreading hirsute above. Racemes usually half exserted from the middle of the spathe and at a right angle to it, $2\frac{1}{4}-4\frac{1}{4}$ lines long, dense, subcontiguous, subsessile, with a tuft of long rigid yellowish hairs at the base of the lower; joints 1-3, filiform, truncate, $\frac{1}{4}$ line long, ciliate; pedicels very similar, the terminal up to 1 line long. Spikelets of the lowest pair of the lower raceme alike, male or barren, the sessile of all the other pairs perfect, the pedicelled male or barren. Perfect spikelets oblong, 1$\frac{1}{2}$-2 lines long, pale. Glumes, lower thinly chartaceous, minutely truncate, dorsally flattened, subglabrous or pubescent, intracarinal nerves 3-5, mostly evanescent below the tip; keels spinuously ciliate above; callus very short, bearded; upper membranaceous, obtuse, 3-nerved, nerves scabrid or ciliate above. Valves, lower linear-oblong, truncate, obscurely 2-nerved or nerveless, subglabrous; upper minutely 2-toothed, almost reduced to a reddish fine geniculate awn, 5-10 lines long. Pale 0; Stamen, up to 1 line long. Pedicelled spikelets oblong-lanceolate to oblong, 2-3 lines long, pale to deep reddish, glabrous or pubescent. Glumes, lower subherbaceous, acutely acuminate, 7-9-nerved; keels spinulously ciliate; upper acute, 3-nerved, ciliate. Valves, lower oblong, obtuse, up to 1$\frac{1}{2}$ line long, faintly 1-sub-3-nerved; upper linear to cuneate-linear, 1 line long or reduced, or 0. Anthers, if present, up to 1 line long.

Habitat:—Natal. Umpumulo, Buchanan 228; Laing’s Nek, Rehmann 6939; Inanda, Wood 1304; without precise locality; Cooper 3346. Var. lepidus (Stapf) between Umzimkulu and Umkomaas, Drège; Umpumulo, Buchanan 229; Zululand, Entumeni, Wood 3991.

Fig. 1. Portion of plant and panicle, about natural size: 2, ligule; 3, racemes, spathe removed. Sessile spikelet—4, lower glume, 5, lower valve; 6, upper valve; 7, pistil, stamens and lodicules. Pedicelled spikelet—8, lower valve. Except fig. 1, all enlarged.
Andropogon filipendulus (Hochst. in Flora, 1846, 115).

Perennial (always ?).—Culms erect, slender, 2-10 feet long, glabrous, more or less branched; branches erect, intravaginal, leafy. Sheaths terete, sub-carinate above, tight or ultimately slipping from the culm, glabrous or the lower sparingly hairy. Ligules membranous, truncate, about 1 line long. Blades linear, tapering to an acute, often very fine point, 1-2 feet long, by \( \frac{3}{4} \)-3 lines broad, flat or subconvolute, glabrous, rarely sparingly hairy, smooth or scaberulous, margins rough.

Panicle narrow, \( \frac{1}{2} - \frac{1}{4} \) foot long, contracted; branches erect, strict, filiform, from lanceolate to linear, long and setaceously acuminate sheaths. Spathes very narrow, linear, 2 inches long, glabrous or finely hairy along the margins. Common peduncles capillary, enclosed in the spathes except the flexuous or pendulous or finely strict upper part, which is pubescent and very long but very scantily bearded. Racemes subcontiguous, slender, unequally pedicelled (the longer pedicule 2-5 lines long, glabrous or hairy), 5-6 lines long; joints filiform, up to \( \frac{3}{4} \) line long, glabrous or sub-glabrous, pedicels somewhat longer, the upper ciliate. Sessile spikelets, 2 in the lower, 3 in the upper raceme, in both only the upper perfect, the others male like the pedicelled spikelets. Perfect Spikelets oblong-linear, 2-2\( \frac{1}{2} \) lines long, pale, tips reddish; callus fine, acute, up to 1 line long, densely bearded. Glumes, lower sub-chartaceous, truncate, glabrous or more or less hairy, intracarinal nerves about 5, prominent all along, or only upwards, not pitted; upper membranous, truncate, 3-nerved, glabrous. Valves, lower linear-oblong, \( 1\frac{1}{2} \) line long, nerveless or almost so, reversely ciliate; upper very finely cuneate-linear, obscurely 2-toothed, passing into a stout awn 1\( \frac{1}{2} \)-2\( \frac{1}{2} \) inches long, rufus hispidulous below. Pale 0. Anthers 1\( \frac{1}{2} \) line long. Male spikelets lanceolate to linear, sub-acuminate, 2\( \frac{3}{4} \)-3\( \frac{1}{4} \) lines long, dull purplish, glabrous. Glumes, lower 9-11-nerved, muticous in the lower, aristulate in the upper pairs; upper acute, 3-nerved, reversely ciliate. Valves oblong, obtuse; lower 1-nerved; upper nerveless, up to 1\( \frac{1}{2} \) line long.

Habitat:—Natal. Throughout the Colony, Krauss 28; near Durban Bay, Krauss 164, partly; Umpumulo Common, Buchanan 223; Zululand, Jenkinson 70 (Wood 7342); 31; Berea, Wood 5933.

Figured from Jenkinson’s 70.

In Wood’s 5933, and Jenkinson’s 70, the number of perfect spikelets is not constant; in the upper glume of the sessile spikelet the margins are hyaline and reversely ciliate, and the upper valve is ciliate and 3-nerved. In the pedicelled spikelets the upper valve is not always present, or when present is very small.

Mr. Jenkinson says of his No. 31: “Very common on any well drained ground, liked by cattle; even in winter; used by natives for thatching. Native name ‘Sibuzana.’”

Found also in tropical Africa and Ceylon, and in a somewhat different form in Australia (A. lachnantherus Bth).

Fig. 1, Plant about natural size; 2, ligule; 3, 2-nate racemes. Sessile spikelet—4, lower glume, front view; 5, upper glume, side view; 6, lower valve; 7, stigmas, stamens and lodicules; 8, upper valve with lower portion of awn. Pedicelled spikelet—9, muticous lower glume; 10, upper glume; 11, lower valve. Except fig. 1, all enlarged.
Andropogon filipendulus. *Hochst.*
Andropogon Ruprechtii (Hack. Androp. in DC. Monogr. Phan. VI. 645).

Perennial, densely tufted.—Culms erect, stout, up to 6 feet long, glabrous, terete, simple or with a leafy branch from one of the uppermost internodes. Sheaths glabrous, pale, striate, tight or somewhat loose, the lowest and those of the innovation shoots keeled, subpersistent, the upper keeled in the upper part, otherwise terete. Ligules membranous, obtuse, up to 1½ line long. Blades narrow, linear from a narrow base, tapering to a fine point, ½-1 foot, by ½-2½ lines, flat or revolute along the margins, rigid, glabrous, smooth or scabrid, midrib rather stout.

Panicle linear to oblong, erect, stiff, up to more than 1 foot long, branches filiform, erect, glabrous, from long narrow glabrous or hairy spathiform sheaths. Spathes very narrow, linear-lanceolate, acuminate, 1½-2 inches long, subscarious to almost herbaceous, pale, reddish or greenish, usually glabrous. Common peduncles filiform, strict, glabrous, enclosed. Racemes about 10 lines long, laterally exserted from the spathe, one subsessile with one sessile male spikelet at the base, and one sessile perfect one above, the other peduncled with one sessile perfect, and two pedicelled male spikelets; peduncle of the upper, and joint of the subsessile raceme, filiform, glabrous, 2, and 1 line long, respectively, each with a hyaline lanceolate 1-2-toothed bract-like appendage about 3 lines long; lowest pedicel very short, glabrous; upper up to 2 lines long, very densely and shortly ciliate. Perfect spikelets subcylindric, over 3 lines long, pale, callus very slender, pungent, 1½ line long, densely bearded. Glumes subcoriaceous, glabrous except the lispidulous tips; lower oblong 2-cuspidate (points up to 1½ line long), finely channelled, inconspicuously 8-10-nerved, margins implicate, sharply so on the extreme tips, otherwise involute; upper lanceolate-oblong, sub-5-nerved. Valves, lower linear-obtuse, 2½ lines long, 2-nerved, scantily ciliate; upper slightly shorter, stipitiform, obscurely 2-toothed, hyaline and 3-nerved at the base. Awn 2-3 inches long, bent near the middle, rufous pubescent below the bend. Pale 0. Anthers 1-1½ line long. Male spikelets narrow, linear-lanceolate, about 5 lines long, glabrous. Glumes, lower subherbaceous, acute or in the upper spikelets narrowed into a scabrid bristle (up to 2 lines long), 7-11-nerved, keels spinulously ciliate; upper 3-nerved, ciliate. Valves subequal, 3-nerved, ciliate. Anthers 2 lines long.

Habitat:—Natal. Zululand, Jenkinson 72 (Wood 7341).

Figured from Jenkinson's specimen, which is the only one in the Government Herbarium.

Also in Tropical Africa, Madagascar, Transvaal and Mexico.

So far as we are aware this grass has not previously been collected in Natal. The leaves of our specimen are pilose with long white hairs, and similar hairs are found on the peduncle of the 2-nate racemes. Mr. Jenkinson says, "a very good grass for thatching, native name um-Tshaba."

Fig. 1. Portion of stem, leaves and inflorescence, about natural size; 2, ligule; 3, spathe and 2-nate racemes. Sessile spikelet—4, lower glume, front view; 4a, same, back view; 5, upper glume; 6, lower valve; 7, upper valve; 8, pistil, stamens and lodicules. Pedicelled spikelet—9, lower glume; 10, upper glume; 11, lower valve; 12, upper valve. Except fig. 1, all enlarged.
PLATE 133.

ANTHISTRIA IMBERBIS (Retz, Obs. iii. 11.)

Perennial, densely tufted; innovation shoots intravaginal. — Culms erect or geniculate and ascending, 1-3 feet long, rather slender, glabrous, simple or branched. Sheaths compressed, keeled, firm, glabrous or the lower sometimes hairy and bearded at the nodes, exceeding the internodes, except the upper. Ligules membranous, very short, obtuse or truncate, ciliate. Blades linear, long tapering to a fine point, 2-8 inches long, by 1-2½ lines broad, very rarely broader, flat, rather rigid, glabrous or hairy below.

PANICLE narrow, often nodding, 3-6 inches long, scantly branched, branches solitary, or the upper 2-3-nate, filiform, glabrous, bearing capituliform, usually dense, fascicles of racemes. Spathes lanceolate, obtusely acuminate, about 1 inch long, rarely longer, usually bearded at the base, glabrous or hairy, greenish or reddish. Racemes 6-9 lines long.

Involutural spikelets whorled, sessile, persistent, lanceolate, acute or acuminate, 3½-5 lines long, rarely longer, glabrous or with scattered, short, tubercle-based hairs, male; their lower glumes not, or very obscurely winged on one side only. Valves, lower generally present. Pedicelled spikelets linear-lanceolate, glabrous, on short glabrous or subglabrous pedicels. Perfect spikelet 1, not exserted from the involucre, linear-oblong, subcylindric, 2½-3½ lines long, callus pungent, up to 1½ line long, glabrous in front, otherwise densely bearded with shining reddish or purplish hairs. Glumes, lower obtuse or emarginate, smooth and shining except the rigidly pubescent or scabrid tip, obscurely 7-9-nerved; upper glabrous. Valves, lower glabrous, somewhat shorter than the glumes; awn of upper valve 2½ inches long. Anthers 1 line long. Grain about 2 lines long.

Habitat: — Natal. Bank of Tugela River (a form with very broad leaves), Buchanan 227; between Umzimkulu and Umkomaas Rivers, Drège; near Dundee, Green, var.; Mooi River, 4-5000 feet alt, Mason 23, partly; Dundee, 4-5000 feet alt., Green 44; Mooi River, Mason 42, 47; Zululand, Jenkinson 28; near Maritzburg, St. George.

Drawn from Green's specimen.

This species or some of its varieties are found throughout the tropics of the Old World. Jenkinson says of his No. 28, which is a variety of the species: "Native name Insinda, hill tops and upland slopes, one of the most useful grasses for all kinds of stock in spring and summer, gets very dry in winter."

Fig. 1, Portion of plant and inflorescence, natural size: 2, ligule: 3, raceme. Pedicelled spikelet—4, lower glume. Involutural spikelet—5, lower glume: 6, upper glume; 7, lower valve. Sessile spikelet—8, lower glume; 9, upper glume; 10, lower valve; 11, upper valve with portion of awn; 12, pistil, stamens and lodicule. Except fig. 1, all enlarged.
Anthistiria imberbis. Reiz.
Paspalum scrobiculatum, Linn.
PLATE 134.

PASPALUM SCROBICULATUM (Linn. Mant. 29).

PERENNIAL?—CULMS fascicled on a very short praemorse rhizome, innovation shoots few, usually intravaginal. Culms erect, rarely ascending from a prostrate rooting base, 1 to several feet long, usually sheathed throughout, glabrous. Leaves glabrous or more or less softly hairy; sheaths lax, rather thin, the lower often purplish; ligules membranous, short. Blades linear to linear-lanceolate, acute to acuminate, 4-8 inches (rarely longer in the African specimens), by 2-4 lines wide, soft, flat or with involute margins. False spikes 2-3 (in the South African specimens), or more. Rhachis herbaceous, 1-1½ line broad, margins rigidly ciliate. Pedicels very short, almost wholly adnate. Spikelets 2, rarely 3-4 ranked, falling entire from the pedicels, imbricate, broadly elliptic to orbicular, obtuse, 1-1½ line long, glabrous. Glumes, lower 0; upper convex, 3-7-nerved, as long as the valves, rarely shorter, or obsolete. Valves, lower flat, often obscurily pitted or wrinkled near the margin, 5-7-nerved, submarginal nerves 2 on each side, very close; upper subcoriaceous, brown, shining. Pale subequal to and of the same nature as the valve, 2-nerved, the flaps auricled; lodicules 2, cuneate. Stamens 3, anthers over ½ line long, styles distinct, slender; stigmas laterally exserted near the tip of the floret. Grain tightly enclosed by the slightly hardened valve and pale, dorsally subcompressed, hilum basal, embryo less than half the length of the grain.

Habitat:—Natal. In swamps by the Umlaas River, Krauss 147; grassy plains between Durban and Umlaas, Krauss 204; Umbumulo, Buchanan 184; without precise locality, Gerrard 587; near Newcastle, Buchanan 175; near Durban, March, Wood 6048; near Maritzburg, St. George 6a; near Dundee, Green 34; Zululand, Jenkinson 46.

A recent number of the "Kew Bulletin" says of this Grass:—"Kodo or Koda Millet of India. An erect growing annual grass, with stems about 2 feet high. It is widely dispersed through the tropics of the Eastern Hemisphere, generally regarded as a valuable pasture grass, and as an ingredient for hay. It sometimes attains a height of 6 to 8 feet. The grain is largely used as food by the natives of India, but it is by no means a wholesome article of diet. Unless special precautions are taken, it is liable to act as a narcotic poison. Cattle, and especially buffaloes, eat the grass readily when it is young. The straw is occasionally used as fodder. Animals are, however, carefully excluded from the fields when the crop is ripening as they appear to suffer even more than men from the ill effects of Koda poisoning." It is the "Ditch Millet" of New South Wales, and the "Herbe à épée" of Mauritius. This grass is widely spread in Natal, but so far as our observation at present goes it is nowhere very plentiful. Native name Samowisana.

Fig. 1, Ligule; 2, rhachis after spikelets have fallen; 3, upper glume; 4, lower valve; 5, upper valve, front view; 6, same, back view; 7, pale; 8, pistil, stamens and lodicules. Except fig. 1, all enlarged.
PLATE 135.

PASPALUM DISTICHUM LINN. (Amoen. Acad. v. 391).

PERENNIAL.—Culms ascending from a creeping, rooting, often very long and branched base, many-noded, sheathed throughout. Leaves numerous, distichous, imbricate below. Sheaths thin, pale, glabrous except the often bearded mouth, the lower at length loose; ligules very short, truncate, with fine hairs from behind; blades linear, acute, 2-4 inches long, by 1-1\(\frac{1}{2}\) line wide, spreading; involute, rarely flat, glabrous. False spikes 2-nate, both pedunculated and articulated on the top of the culm, rarely 3-nate, often spreading. Rhachis herbaceous, \(\frac{1}{2}\) line broad, margins scabrid.

SPIKELETS subsessile, falling entire from the short pedicels, solitary, oblong, acute to acuminate, 1-2 lines long, dorsally flattened, imbricate and adpressed to the rhachis, glabrous, pale. Glumes, lower 0; upper slightly convex, 5 or 4 nerved (middle nerve suppressed) side nerves close, sub-marginal. Valves, lower very like the glume, middle nerve always percurrent, side nerves 2-3 on each side, submarginal; upper distinctly shorter, subcoriaceous, 3-nerved, smooth, pale. Pale obscurely auricled. Stamens 3; anthers \(\frac{3}{4}\) line long. Styles and stigmas as in P. scrobiculatum. Grain \(\frac{1}{2}\) line long.

Habitat:—Natal. Coast marshes, Buchanan 84; without precise locality, Gerrard 590; Clairmont, 50 feet alt., March, Wood 6043.

Drawn from Wood's specimen which was certified by Professor Hackel, and is the only authentic specimen in the Government Herbarium.

Found in most warm countries. Baron Mueller says of this grass: "The Silt grass," a creeping bank or swamp grass forming extensive cushions. It keeps beautifully green throughout the year, affords a sufficiently tender blade for feed, and is exquisitely adapted to cover silt or bare slopes on banks of ponds or rivers, where it grows grandly; moderate submersion does not destroy it, but frost injures it: it thrives well also on salt marshes. Excellent for fern tree tubs to produce a green sward and some overdrooping foliage. The chemical analysis made in spring gave the following results: Albumen 2·20; gluten 7·71; starch 1·56; gum 1·64; sugar 5·00."

Fig. 1, Ligule; 2, rhachis with one spikelet; 3, upper glume; 4, lower valve; 5, upper valve; 6, pale; 7, stamens, pistil and lodicules. Except fig. 1, all enlarged.
Paspalum distichum, Linn.
Digitaria monodactyla, Stapf.
DIGITARIA, LINN.

Spikelets lanceolate to elliptic-oblong, flat in front, convex on the back, falling entire from the pedicels, usually 2-3-nate, and pedicelled on the triquetrous or dilated rhachis of very slender and usually spiciform racemes or false spikes; lower floret barren reduced to the valve and a very minute rudimentary pale; upper perfect. Pale of upper floret subequal to the valve, 2-nerved, of the same texture. Lodicles 2, minute, broadly cuneate. Stamens 3. Styles distinct; stigmas laterally exserted near the tip of the floret. Grain tightly enclosed by the slightly hardened rigid valve and pale, oblong, slightly dorsally compressed; hilum basal, punctiform; embryo less than half the size of the grain.

PLATE 136.

**Digitaria monodactyla** (Stapf, Fl. Cap., Vol. VII., p. 373).

Perennial, compactly tufted, innovation shoots intravaginal.—Culms very slender, erect, 1-1½ foot long, glabrous, 1-2-noded above the base, simple.

Leaves crowded at the base. Sheaths very tight, glabrous, or scantily hairy, the lower firm, persistent, at length sometimes breaking up into fibres. Ligules very short, truncate. Blades setaceously convolute, filiform, 2-4 inches long, rather rigid or flexuous, glabrous or scantily hairy, smooth. Racemes spikelike, solitary, terminal on the long exserted culm, very slender, 2½-5 inches long; rhachis wavy, very narrow, ciliate, midrib obtuse, stout. Pedicels 2-nate, densely ciliate, unequal, the longer up to ⅜ line long.

Spikelets subimbricate, adpressed to the rhachis, the superposed ones distant almost by their own length, oblong-lanceolate, up to 1½ line long, with silky and adpressed hairs. Glumes, lower 0; upper linear-oblong, ⅓ to almost 1 line long, long and densely ciliate, 3-2-nerved. Valves, lower oblong-lanceolate, subacuminate, up to 1½ line long, 5-7-nerved, densely and long ciliate, particularly along the marginal nerves; upper 3-nerved, subchartaceous, ovate-lanceolate, subacuminate, 1 line long, smooth, brown; flaps of pale very broad below, overlapping. Anthers ⅛ line long.

Habitat:—Natal. Near Newcastle, Buchanan 181; also in Cape Colony and Free State.

Drawn from Buchanan's specimen, which is the only one in the Government Herbarium.

Digitaria has lately been separated from *Panicum*, of which genus it formerly a section.

Fig. 1, Ligule; 2, portion of rhachis with spikelets; 3, upper glume; 4, lower valve, front view; 5, same, back view; 6, upper valve; 7, pale; 8, stigmas, stamens and lodicules. Except fig. 1, all enlarged.
PLATE 137.

DIGITARIA ERIANtha (Steud. in Flora, 1829, 468).

Perennial, densely tufted. Rhizome short, praemorse.—Culms erect or geniculate, rather stout, 1 1/2-3 feet long, glabrous, 2-4-noded, usually simple, sometimes scantily branched below. Sheaths striate, rather loose, the upper shorter than the internodes, the lowest more or less hirsute-tomentose at the base, otherwise glabrous or scantily hirsute; ligules hyaline between the more or less produced margins of the sheath-mouth, 1 1/2-4 lines long. Blades linear, tapering to a fine point, 1/2-1 foot long, by 1-2 lines wide, or the lowest sometimes much shorter, flat or with the margins revolute, rigid, rarely flaccid, glaucous, glabrous or scantily hairy at the base, margins scabrous above.

Racemes 4 to many, subdigitate, slender, erect, or suberect, 4-8 inches long, straight or flexuous, sometimes pinkish; rachis very slender, triquetrous, angles scarcely winged, scabrid, internodes up to 1 line long, rarely longer. Pedicels 2-nate, filiform, scabrid, unequal, the longer 1 line, rarely 1 1/2 line long.

Spikelets oblong or ovate-lanceolate, 1 1/4-1 1/2 line long, sub-adpressed, pale green, often silvery. Glumes, lower membranous, ovate, acute or obtuse, up to 1/3 line long, nerveless; upper lanceolate, acute, about 1 line long, 3-nerved, with 4 lines of very fine, usually adpressed, long silky hairs. Valves equal, lower oblong, or ovate-lanceolate, acute, 7-9-nerved, inner 4 side nerves like the middle nerve very prominent, marginal nerves faint, lines of usually adpressed dense long silky hairs between the inner pair of side nerves and along the margins; upper subchartaceous, oblong, shortly acuminate, 3-nerved, dull green. Anthers 3/4 line long.

Habitat:—Natal. Plant 62; between Umzimkulu and Umkomaas Rivers, Drège; coast regions, Sutherland; Nottingham, Buchanan 138; very common near Umphumulo, Buchanan 208; without precise locality, Gerrard 467; Zululand, Jenkinson 9; near Durban, Wood 7634.

Drawn from Jenkinson's specimen and compared with Buchanan's 208 and Wood's 7634.

Mr. Jenkinson says of this grass: "Good for cattle; found in scattered tufts. A favourite grass for ticks. Used by natives for plaiting bracelets."

Fig. 1, Ligule; 2, rachis with spikelets; 3, upper glume; 4, lower valve; 5, upper valve; 6, pale; 7, ovary, styles, stigmas, stamens and lodicules. Except fig 1, all enlarged.
Digitaria eriantha, Steud.
Digitaria ternata, Stapf.
PLATE 138.


Annual.—Culms fascicled, erect from a geniculate base, slender, simple, ½-2 feet long, glabrous or more or less beset with fine long spreading hairs below the racemes; about 2-noded. Sheaths glabrous or scantily fimbriate at the mouth. Ligules short, truncate. Blades linear-lanceolate to linear, acute, 2-9 inches by 3 lines, flat, flaccid, glabrous or sparingly hairy near the base.

Racemes 2-7, subdigitate, erect or spreading, very slender, strict, 2-12 inches long. Rhachis very narrow, linear, up to ½ line broad, margins scabrid, internodes about 1½ line long. Pedicels 2-3-nate, unequal, up to more than 1 line long, shortly hairy towards the scarcely thickened tips.

Spikelets adpressed to the rhachis, oblong-elliptic, obtuse or sub-obtuse, about 1 line long, pale. Glumes, lower 0; upper very delicate, narrower and shorter than the upper valve, 3-nerved, sides densely villous with clavate hairs. Valves subequal; lower prominently 5-nerved, very densely and appressedly silky villous with clavate hairs; upper chartaceous, ovate-oblong, subacute, dark brown to black except the whitish hyaline margins. Anthers ½ line long.

Habitat:—Natal. Near Umpumulo, 2000 to 2500 feet, Buchanan 203; 205; and without precise locality 77; Dundee, Green 83.

Also in Abyssinia and India.

Drawn from Green’s specimen and compared with Buchanan’s 203 and 205.

Though this species is said to have no lower glume, a microscopic rudiment of it may often be seen at the base of the upper one.

In the Flora of British India this plant is described as Paspalum ternatum, Hk. f., and it is said by Schimper to be a pest in cultivated fields.

Fig. 1, Ligule; 2, rhachis with spikelets; 3, upper glume; 4, lower valve, back view; 5, same, front view; 6, upper valve; 7, pale; 8, ovary, style, stigmas, stamens and lodicules. All enlarged.
**PLATE 139.**


**Perennial,** densely caespitose.—**Culms** erect, very slender, ½-1 foot long, glabrous. Leaves glabrous except the scantily hairy mouth of the sheath, or more or less hairy, all crowded at the base, except the uppermost, which is reduced to a very long almost bladeless sheath; basal sheaths firm, persistent, at length breaking up into fibres; ligules very short, truncate. Blades filiform, setaceous convolute, up to 2-6 inches long, rather firm, flexuous, smooth.

**Racemes** 2-3, slender, erect, 1-2 inches long; rhachis very slender, angular, smooth, internodes 1½-2 lines long, pedicels 2-nate, one very short, the other up to 1½ line long, angular, scantily scabrid above.

**Spikelets** oblong, obtuse, 1½ line long, greenish. Glumes, *lower* minute, rotundate, delicately hyaline; *upper* oblong, subacute, 1½ line long, 3-nerved, with lines of adpressed or slightly spreading, rufous capitellate hairs between the nerves, and along the margins, upper marginal hairs exceeding the glume. Valves, *lower* 7-9-nerved, nerves prominent, except the submarginal hairs similar to those of the upper glume, in 4 dorsal and 2 dense marginal lines; *upper* subchartaceous, oblong, subacuminate, chestnut brown, except the hyaline whitish margin. Anthers ½ line long.

**Habitat:**—**Natal.** Hillside, near Mooi River, 4-5000 feet alt., *Mason* 6.

Drawn from *Mason's* specimen, the only one in the Herbarium.

Also in Tembuland, which is the only South African locality given for it in the *Flora Capensis.*

Fig. 1, Ligule; 2, rhachis with pedicels; 3, upper glume; 4, lower valve; 5, upper valve, front view; 6, same, back view; 7, pale, front view; 8, same, back view; 9, ovary, styles, stigmas, stamens and lodicules; 10, capitellate hair. *All enlarged.*
Digitaria setifolia, Stapf.
Digitaria horizontalis, Willd.
PLATE 140.


**Annual.**—*Culms* ascending from a geniculate or more or less prostrate, sometimes rooting branched base, slender, 1-several feet long, glabrous, few to many noded, upper internode by far the longest.

*Leaves* glabrous or hairy; sheaths thin, the lower withering; ligules very short. Blades linear-lanceolate to linear, acute or gradually tapering from below the middle, 2-5 inches long by 2-4 lines wide (in the South African specimens), flat, flaccid, margins scabrid.

*Racemes*, 4 to many, subdigitate or on an angular common axis of variable length (one to several inches long), singly or the lower subverticillate, erect or spreading, slender, strict, 1½-6 inches long, usually villous or bearded at the base, often with a few scattered, stiff, long, very fine hairs from the common axis; rachis very narrow, usually wavy, triquetrous, lateral angles more or less winged, scabrid, internodes about 1½ line long (in the South African specimens), or longer. Pedicels 2-nate, one very short, the other up to ¾ line long, triquetrous, scabrid.

*Spikelets* linear-oblong, acute, ¾-1 line long, greenish. Glumes, lower extremely minute or suppressed; upper lanceolate-oblong, equalling ½ of the upper valve, 3-nerved, with lines of extremely fine adpressed silky hairs between the nerves and along the margin, or with the marginal hairs spreading. Valves equal or subequal; lower prominently and closely 7-nerved, with lines of extremely fine adpressed silky hairs between the outer nerves and along the margins, or with the marginal hairs spreading; upper subchartaceous, acute, pale-greenish.

**Habitat:**—**Natal.** Near Durban, Drège; Williamson 27; Umpumulo Buchanan, 202; 204.

Drawn from Buchanan’s No. 204, the specimen being in bad condition, and neither stamens nor stigmas being present.

Fig. 1, Ligule; 2, rachis with 2-nate pedicels; 3, upper glume; 4, lower valve; 5, upper valve, front view; 6, same, back view; 7, pale. *All enlarged.*
PLATE 141.


**Annual.**—Culms ascending from a geniculate or prostrate, often rooting, branched base, 1 to several feet long, glabrous, few to many noded, upper node by far the longest. Leaves glabrous or hairy; sheaths thin, herbaceous, loose, sometimes bearded at the nodes; ligules truncate, up to more than 1 line long. Blades linear-lanceolate to linear, acute, 1-5 inches long by 2-4 lines wide, flat, flaccid, margins scabrid.

Racemes few to many, subdigitate, solitary or 2-3-nate on a short angular scaberulous common axis, erect or spreading, rather stout for the genus, usually strict, 1-6 inches long, often finely villous at the base; rhachis triquetrous, lateral angles winged, scabrid, internodes over 1 line long; pedicels 2-nate, one very short, the other up to $\frac{1}{2}$ line long, triquetrous, scabrid.

Spikelets oblong, acute, 1-1$\frac{1}{2}$ line long, greenish or purplish. Glumes, lower ovate, acute, about $\frac{1}{6}$ line long; upper ovate-lanceolate, acute, equalling $\frac{1}{3}$ or less of the upper valve, 3-nerved, with lines of extremely fine adpressed silky hairs between the nerves and along the margins. Valves, lower oblong-acute, 7-nerved, the inner lateral nerves somewhat distant from the middle nerve, very prominent, the outermost submarginal, faint lines of very fine adpressed silky hairs along the margins and often also between the lateral nerves; upper subchartaceous, oblong, subacuminate or acute, greenish or purplish, slightly shorter than the lower valve. Anthers up to $\frac{1}{2}$ line long.

**Habitat:**—Natal. Near Durban, Williamson, 10; Berea, 100 feet alt., Wood 5998.

Drawn from Wood's specimen, which is the only one in the Government Herbarium.

Fig. 1, Ligule; 2, rhachis with 2-nate pedicels; 3, upper glume; 4, lower valve, back view; 5, upper valve, front view; 6, same, back view; 7, pale, front view; 8, same, back view; 9, ovary, styles, stigmas, stamens and lodicules. *All enlarged.*
Digitaria sanguinalis, Scop.
Digitaria diversinervis, Stapf.
PLATE 142.

Digitaria diversinervis (Stapf Fl. Cap. Vol. VII. p. 379.)

Perennial (?).—Culms ascending from a prostrate, rooting, loosely branched base, very slender, weak, up to 1 1/2 foot long, glabrous, 4-6 noded; uppermost internode by far the longest, long exserted. Leaves glabrous or very sparingly hairy; sheaths thin, the lower withering; ligules very short. Blades linear-lanceolate, acute, 1-3 inches by 1 1/2-2 1/2 lines, flat, flaccid, scabrous in the upper part, margins scabrid.

Racemes subdigitate, slender, erect or spreading, 1 1/4-2 inches long, minutely villous at the insertion. Rhachis very narrow and wavy, triquetrous, angles scabrid, internodes up to 2 lines long. Pedicels 2-nate, one very short, the other up to 1 line long, triquetrous, scabrous.

Spikelets oblong, acute, 1 1/4 line long, greenish, glabrous. Glumes thin, lower broadly ovate, up to 3/8 line long, 1-nerved, or nerveless; upper ovate, acute, 1 line long, 1-sub-3-nerved. Valves equal, lower 7-9 nerved; upper subchartaceous, acuminate, pale to dark brown.

Habitat:—Natal. In woods near Durban, Drège; Plant 56; McKen 10; Durban Flat, Buchanan; without precise locality, Gerrard, 695; 589; Berea, 150 feet alt., Wood 5923.

Drawn from Wood's specimen,

Fig. 1, Ligule: 2, rhachis with 2-nate pedicels: 3, lower glume: 4, upper glume: 5, lower valve, back view: 6, same, front view: 7, upper valve, front view: 8, same, back view: 9, pale, front view: 10, same, back view: 11, ovary, styles, stigmas, stamens and lodicules. All enlarged.
PLATE 143.


ANNUAL OR SUB-PERENNIAL.—Culms fascicled, very slender, prostrate and rooting, or ascending or sub-erect, $\frac{1}{2}$-1$\frac{1}{2}$ foot long, glabrous, many-noded, often branched. Sheaths rather lax, the lower more or less hairy, sometimes bearded at the nodes; ligules very short, membranous. Blades lanceolate to linear, acute, $\frac{1}{2}$-4 inches long, spreading, flat, glabrous, rarely hairy.

Racemes usually 2-3, rarely more, very slender, 1-3 inches long, erect or spreading. Rhachis finely linear, margins scabrid. Pedicels 2-rarely 3-nate, unequal, tips discoid.

Spikelets adpressed to the rhachis, the superposed distant by rather less than their own length, elliptic-oblong, acute or subacute, $\frac{2}{3}$-$\frac{3}{4}$ line long, pale or purplish. Glumes, lower 0; upper 5-3-nerved, very finely and adpressed silky with wrinkled hairs. Valves, lower similar and subequal to the upper glume, flat, 7-nerved; upper subchartaceous, ovate-oblong, slightly shorter than the lower, flaps of pale overlapping below. Anthers $\frac{1}{4}$ line long.

Habitat:—Natal. Near Durban, Drège; Durban Flat, Buchanan, 35; near Umpumulo, Buchanan, 204a; and without precise locality, Gerrard, 588.

Drawn from Buchanan's 204a.

Through the tropics of the Old World.

Fig. 1, Ligule: 2, upper glume: 3, lower valve: 4, upper valve: 5, pale: 6, rhachis with pedicels. All enlarged.
PLATE 144.


**Perennial.**—**Culms** tufted on a short premonrose rhizome, erect, rather firm, simple, up to more than 3 feet long, glabrous or hairy below the racemes, 1-3-noded, the uppermost internode by far the longest. Leaves mainly crowded near the base; lower sheaths rather firm, strongly striate, adpressed hairy to tomentose at the base, persistent, at length breaking up into fibres, upper-thinner, hairy or glabrous except the bearded nodes, uppermost very long, rather loose; ligules up to 1\(\frac{1}{2}\) line long, obtuse or truncate. Blades linear, tapering to a fine point, 1-1\(\frac{1}{2}\) foot long, by 2-4 lines wide, flat or with involute margins, rigid or almost flaccid, scabrid, glabrous or softly hairy.

**Racemes** 5 to many, solitary or fascicled, on a scabrid or hirsute angular common rhachis of variable length (the whole inflorescence 1\(\frac{1}{2}\) foot long), slender, strict or flexuous, erect or more or less spreading, 2-5 inches long, villous at the base. Rhachis subtriquetrous, wavy, very narrow, angular, angles rigidly ciliate, internodes up to 1\(\frac{1}{2}\) line long.

**Spikelets** in fascicles of 3-6, oblong, obtuse to subacute, 1-1\(\frac{1}{2}\) line long; pedicels unequal, up to 1\(\frac{1}{2}\) line long, setulose, uppermost hairs equaling the spikelets. Glumes, lower 0; upper rotundate-ovate, obtuse, 1\(\frac{1}{2}\) line long, hyaline, nerveless or 1-nerved. Valves equal, lower membranous, whitish, oblong, glabrous, 3-nerved; upper cartaceous like the pale, brown to almost black, somewhat shining. Anthers 1\(\frac{1}{2}\) line long.

**Habitat:**—**Natal.** Near Durban, Drège; very common near Mapumulo, Buchanan 206; hill tops near Riet Vlei, 6000 feet alt., Buchanan 207; without precise locality, Buchanan 72; near Maritzburg, St. George 34; Zululand, Jenkinson 83.

Drawn from St. George’s specimen.

Fig. 1, Rhachis with pedicels: 2, upper glume; 3, lower valve; 4, upper valve; 5, pale; 6, ovary, styles, stigmas, and lodicules. *All enlarged.*
PLATE 145.


**Perennial.**—Rhizome short, oblique, densely covered by the persistent imbricate bases of the old sheaths. Culms erect, simple, 1-1½ foot long, glabrous.

**Leaves** about 4 at the base, one from the only suprabasal node, reduced to a long almost bladeless sheath. Sheaths hairy, the uppermost narrow, silky bearded at the node, the lower widened. Ligules short, truncate. Blades linear to linear-lanceolate, tapering to an acute point, 2-3½ inches long, by 2-3 lines wide, flat, firm, glaucous, glabrous or hairy.

**Racemes** 3-6, subdigitate, erect, strict or slightly nodding, densely silky often purplish, 2½-3 inches long, compound below. Racemes triquetrous, narrowly winged, scabrid, internodes 1½-3 lines long.

**Spikelets** 2-5-nate, or in the lowest fascicle with the central 2-3 on a very short branchlet, oblong, acute, 2-2½ lines long (exclusive of the hairs), densely silky, unequally pedicelled, longer pedicels up to 3 lines long, filiform, flexuous, glabrous, tips subdiscoid. Glumes, *lower* delicately hyaline, whitish, truncate or rotundate, up to ½ line long; *upper* oblong, acute to obtuse, ½-1½ line long, 3-nerved, densely villous with long, soft, acute hairs, upper margins broadly and very delicately hyaline. Valves; *lower* oblong, acuminate, 7-nerved, glabrous along the middle, otherwise densely villous with soft, very long hairs (up to 2 lines); *upper* chartaceous, oblong, acutely acuminate, 2 lines long. Anthers over 1 line long.

**Habitat:**—**Natal.** Umsinga and base of Biggarsberg, Buchanan, 87; Mooi River, 4-5000 feet alt., Mason 21.

Drawn from Mason's specimen, the only one in the Government Herbarium.

This grass is in appearance very like a *Tricholaena*, with which genus it has no doubt often been confused by collectors. I have no information as to its value as a pasture grass.

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, upper valve, front view; 5, same, back view; 6, pale, front view; 7 same, back view; 8, pistil, stamens and lodicules. *All enlarged.*
Digitaria tricholaenoides, Slapf.
Panicum Helopis T. W. var. alabrescoens, K. Schum.
Mature spikelets falling entire from their pedicels, loosely panicked, solitary 2-nate or fascicled on the rhachis of the spike-like branches (false spikes) of a panicle. Upper floret perfect. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct; stigmas laterally exserted below the tip of the floret. Grain tightly enclosed by the hardened valve and pale, oblong or ellipsoid; hilum basal, punctiform or orbicular; embryo equalling about half of the grain.

A large genus, including 200 to 250 species, many of which are valuable fodder grasses.

PLATE 146.


Annual.—Culms suberect or ascending from a geniculate sometimes decumbent and rooting base, 1-2 feet long, glabrous, striate, 4-to-many-noded, branched or simple except at the base.

Leaves more or less finely hirsute with tubercle-based hairs, rarely glabrescent or glabrous; sheaths rather lax, pubescent to villous at the nodes, ciliate above. Ligules very short, membranous, fimbriate. Blades linear-lanceolate to lanceolate from a broad-rounded or cordate base, acute to acuminate, 2-4 inches long by 3-8 lines wide, flat, flaccid, margins often wavy, scabrid or fimbriate.

False spikes 3-12, rather distant on a compressed or angular, scabrid or often pubescent, common axis, suberect or spreading, second, 2-ranked. Rhachis linear, 1/4-1/2 line broad, flat on the back, with a very prominent midrib on the face, scabrid or spinulously ciliate, and often with scattered, fine, long, tubercle-based bristles as well. Pedicels usually solitary, very short, stout, scabrid, pubescent, with or without 2-3 bristles near the thickened tips.

Spikelets contiguos or subimbricate, ovate to ovate-oblong, acute, 2-2 1/2 lines long, pallid, glabrous. Glumes, lower turned away from the rhachis, broadly ovate, clasping, obtuse, equalling 1/3 of the spikelet, hyaline, 3-5-nerved; upper membranous, ovate to ovate-oblong, subacute to subacuminate, prominently 7-9-nerved. Lower floret male or barren. Valve ovate, acuminate, 5-7-nerved, pale equal, subacute. Perfect floret elliptic, rounded at both ends, 1 1/4 line long, pallid. Valve with a scabrid mucro, up to 1/2 line long, transversely wrinkled, 5-nerved. Anthers scarcely 1/2 line long. Grain elliptic, dorsally compressed. Embryo 3/4 the length of the grain.

Habitat:—Natal. Without precise locality Buchanan, 78; near Maritzburg St. George 17 (Wood 7240).

Drawn from St. George's specimen, the only one in the Government Herbarium.

Also in Cape Colony and Orange Free State, Mascarene Islands, East Africa, Abyssinia, and India. The typical form with densely pubescent spikelets has not been found on the African Continent.

Fig. 1, Lower glume: 1a, upper glume. Male floret—2, lower valve: 3, pale. Perfect floret—4, upper valve, back view: 5, same, front view: 6, pale: 7, stamens, pistil and lodicules: 8, rhachis with pedicels: 9, ligule. All enlarged.
PLATE 147.

Panicum brizanthum (Hochst. in Flora, 1841, Intell. 1.19 (name only) and ex A Rich. Tent. Fl. Abyss. 11,363.) (Fl. Cap. Vol. VII. p. 386).

Perennial.—Culms erect or geniculately ascending from a short rhizome, stout in tall specimens, 1½-6 feet long, glabrous or hirsute with tubercle-based hairs. 4-6 or sometimes many-noded, upper internodes exserted.

Leaves glabrous or hirsute with fine tubercle-based hairs; sheaths rather tight, terete, striate; ligule a narrow fimbriate rim; blades linear to sublanceolate, acute to acuminate, 2-15 inches long, by 3-8 lines wide, usually flat, firm, light green, margins cartilaginous, spinulos.

False spikes, solitary or more usually 2-8 on a slender triquetrous seabrid or rarely almost smooth and often hairy, common axis, distant, often curved, and more or less spreading, rather stout, 2-6 inches long; rhachis slender, linear, dorsally keeled, seabrid and more or less fringed with tubercle-based hairs, villous at the base, internodes 1½-2 lines long; pedicels solitary, alternate from near the edges, very short, stout.

Spikelets usually 1-ranked, contiguous, ellipsoid, obtuse, turgid, about 2½ lines long; pallid, with purple tips, glabrous. Glumes, lower membranaceous, very broad, clasping, obtuse, 1-1½ line long, 7-11 nerved, often purple; upper firmly membranaceous, oblong, very concave, 2-2½ lines long, 7-9 nerved, nerves anastomosing above. Lower floret male, valve similar to the upper glume, 5-nerved; pale broad, elliptic, obtuse, 2-keeled; anthers 1½ line long. Perfect floret equalling the upper glume, oblong; valve crustaceous with an obscure callous tip, very finely pitted, 5-nerved, whitish; flaps of pale very broad above the base.

Habitat:—Natal.—Near Umpumulo, Buchanan 183; Inanda, Wood 1579; Fenton Vacy, Wood, 1577.

Also in Tropical Africa.

Fig. 1, Lowest glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, stamens, ovary, style, stigmas and lodicules. All enlarged.
Panicum brizanthum, *Hochst.*
Panicum serratum, Spreng.
PLATE 148.


**Perennial.**—Rhizome short, thick, tomentose, with equally tomentose innovation buds.

Culms erect or geniculately ascending, simple or often much branched above the base, slender, \(1\frac{1}{2}-2\) feet long, terete, pubescent above.

Leaves often crowded, dichotomously imbricate towards the base; sheaths tight, terete, the lowest tomentose, sometimes glabrescent, the following gradually less hairy glabrescent or glabrous, except the pubescent or villous margins and nodes; ligule a fringe of short rigid hairs; blades linear to linear-lanceolate with a callous point, 1-4 inches long, by \(1\frac{1}{2}-2\frac{1}{2}\) lines wide, rigid, flat or involute, glabrous or hairy, particularly near the base, margins cartilaginous, wavy, spinulose.

False spikes 4-10, secund on a filiform, angular, glabrous or puberulous common axis, erect or spreading, usually longer than the internodes, gradually decreasing upwards, dense, 12-3 lines long, rhachis filiform, angular, very wavy, rigidly pubescent to sub-hirsute: pedicels solitary or the lowest 2-nate, filiform with discoid tips, curved, the lower very short, the upper up to 1 line long, hairy.

Spikelets usually 2-ranked, contiguous or subcontiguous, obovoid-ellipsoid, obtuse, turgid, \(1\frac{1}{4}-1\frac{3}{4}\) line long, pallid, overtopped by a purplish tuft of silky hairs. Glumes, lower facing the rhachis, subhyaline, broadly ovate to rotundate-ovate, obtuse, \(\frac{3}{4}-1\) line long, often purplish, 3-nerved, hairy; upper membranous, broadly elliptic, acute or subcuspidate, \(1\frac{1}{4}-1\frac{1}{2}\) line long, very concave, faintly 5-nerved, minutely villous or glabrescent in the centre, with a transverse fringe of purplish hairs below the glabrous tip. Lower floret male, valve equal and similar to the upper glume, but more distinctly cuspidate, hyaline and glabrous along the middle nerve, transverse fringe broken up into 2 broad tufts; pale broad, almost equalling the valve; anthers over 1 line long. Perfect floret elliptic, cuspidate or mucronulate, 1-1\(\frac{1}{4}\) line long, valve elliptic, coriaceous, pallid, glabrous or ciliate near the tip, finely pitted.

**Habitat:**—**Natal.**—Umpumulo 2,400 feet alt., Buchanan 213; Umsinga and base of Biggarsberg, Buchanan, 105; Riet Vlei 4-5000 feet alt., Buchanan 214.

Fig. 1, Lowest glume: 2, upper glume. **Male floret.**—3, lower valve; 4, pale; 5, stamens and lodicules. **Perfect floret.**—6, upper valve, front view; 7, same, back view; 8, pale; 9, stamens, style, ovary, stigma and lodicules; 10, ligule. All enlarged.
PLATE 149.


**Annuál.**—Culms geniculately ascending from a sometimes decumbent and rooting base, very slender, 1-2 feet long, terete or angular, glabrous, 3 to many-noded, much branched below, simple above. Sheaths rather tight, terete or subterete, strongly striate, softly hairy or glabrous, except at the minutely villous nodes, the upper shorter than the internodes. Ligule a dense fringe of stiff hairs. Blades linear-lanceolate from a rounded base, acute, 1-2½ inches long, by 1-2½ lines wide, flat or involute, rather rigid, softly hairy or quite glabrous, margins very scabrid.

**False spikes** 2-10, secund or subsecund, on an usually adpressed to a filiform scabrid axis; as long as, or longer than the internodes, very slender, ½-1 inch long. Rhachis filiform, wavy, triquetrous, scabrid, 1-3 inches long. Pedicels solitary, very short, stout, scabrid or bristly, tips thickened with hyaline margins.

**Spikelets** 2-ranked, secund, contiguous, oblong, subacute or obtuse, about 1 line long, pallid with purplish tips, softly pubescent. Glumes, lower facing the rhachis, minute, nerveless, rarely ½ line long and 1-nerved; upper membranous, oblong, 5-nerved, minutely hairy. *Lower floret* usually barren, sometimes male. Valve like the upper glume but narrower, 5-3-nerved, pale very obtuse, subequal to the valve in male, shorter in barren florets, *Perfect floret* elliptic-oblong, rounded at both ends, ¾ line long. Valve subcoriaceous, faintly 5-nerved, shining, whitish, finely granulate. Anthers ½ line long. Grain oblong-ellipsoid ½ line long, hilum orbicular, ½ length of the grain.

**Habitat:**—**Natal.**—Riet Vlei 4,000 feet alt., Buchanan 215, 216.

Also in Basutoland and Bechuanaland.

Drawn from Buchanan’s specimens, the only ones in the Government Herbarium.

Fig. 1, Upper glume. *Lower floret.*—2, lower valve, front view; 3, same, back view; 4, pale. *Perfect floret.*—5, upper valve; 6, pale; 7, stamens, pistil and lodicules; 8, ligule. *All enlarged.*
Panicum trichopus, Hochst.
PLATE 150.


PERENNIAL?—Culms ascending from a decumbent geniculate base, 1-2 feet long, slender, glabrous or pubescent, 4-to many-noded, simple or scantily branched above the base. Leaves finely hirsute with tubercle-based hairs, rarely glabrescent; sheaths rather lax, bearded at the nodes, ciliate along the outer margin; ligules membranous, very short, fimbriate. Blades linear to linear-lanceolate from a broad rounded or sub-cordate base, acute to acuminate, 2-4 inches long, by 2-6 lines wide, flat, flaccid, margins often wavy, scabrid, or fimbriate.

FALSE SPIKES 3-12, rather distant on a compressed or angular pubescent, sometimes bristly, common axis, sub-erect or spreading, secund,2-4-ranked, 1-1½ inch long; rhachis linear, ½-⅔ line broad, flat on the back, with a very prominent midrib on the face, scabrid or spinulously ciliate, and often with long tubercle-based bristles as well, villous at the base; pedicels solitary or 2-nate, and then unequal, very short, stout, scabrid, pubescent, with 1-3 bristles near the thickened tips.

SPIKELETS contiguous or imbricate, elliptic-ovate, acutely acuminate, 2 lines long, pale. Glumes, lower turned away from the rhachis, elliptic, obtuse, equalling ⅔ of the spikelet, subhyaline, 3-nerved with 1-3 bristles from a central tubercle; upper membranous, elliptic-ovate, acutely acuminate, 2 lines long, 5-nerved, scantily pubescent, sometimes with a few rigid cilia on one side. Lower floret male. Valve like the upper glume, 3-5-nerved, rigidly and appressedly ciliate on one or on both sides; pale equal; acuminate. Anthers ⅓ line long. Perfect florets broadly elliptic, rounded, 1-1½ line long, whitish. Valve with a scabrid mucro up to ¾ line long, 5-nerved, finely and transversely rugose. Anthers ¾ line long.

Habitat:—Natal. Umpumulo, 1,000 feet alt., Buchanan 218.

Also in Tropical Africa.

Fig. 1, Lower glume; 2, upper glume. Lower floret.—3, lower valve; 4, pale; 5, stamens and lodicules. Perfect floret.—6, lower glume; 7, pale; 8, stamens, style, stigma, ovary and lodicules; 9, pedicel. All enlarged.
PLATE 151.

CRUS-PAVONIS. **Var. rostratum** Stapf.
PLATE 151.


Nat. Order Gramineæ.

Perennial.—Culms erect, stout, terete, up to 5 feet long, and to 3 lines thick below, glabrous, smooth, about 5-noded, sheathed all along or the internodes at length more or less exerted.

Leaves quite glabrous, sheaths terete, striate, smooth; ligules none, junction of sheath and blade quite glabrous inside or scantily and very minutely pubescent.

Blades lanceolate-linear from a slightly narrowed base, which is usually long decurrent in the upper leaves, tapering to a very fine point, 3 to 10 inches by 5 to 9 lines, flat, rather firm, smooth above, scaberulous below, at least in the upper part, margins cartilaginous, scaberulose to spinulobulous, midrib broad, white.

Panicle erect, linear-oblong, 4 to 10 inches long, dense; axis rather stout, triquetrous, very scaberulose; branches solitary or 2-nate, distant below, close above, the lower 1½ to 4½ inches long, forming sessile, stout, very dense, simple or compound, subsecund false spikes; rhachis usually beset with tubercle-based bristles; pedicels 2-nate or fascicled on very short branchlets, very short, up to ½ line long, scaberulose, tips obscurely discoid.

Spikelets in compact clusters, elliptic-oblong, caudate-acuminale, 1½ to 1½ line long, light green or tinged with purple.

Glumes, lower very broadly ovate, acute to subacuminate, clasping at the base, ½ to ¾ line long, 3 to 5-nerved, scaberulous, upper herbaceous-membranous, broadly oblong, very concave, cuspidate-acuminate, equaling the spikelet, 5-nerved, rigidly pubescent between the scabrid or scaberulous nerves. Florets: lower barren; valve similar to the upper glume, but flat or depressed on the back, tips rostrate, laterally compressed, up to ½ line long; pale oblong, keels scaberulous above. Perfect floret ovate-oblong, subacuminate or cuspidate, up to 1½ line long, greenish yellow, smooth; valve crustaceous, 5-nerved. Anthers linear, ½ line long. Grain obovate-oblong, very broad, ¾ line long.

Habitat: Natal. On sand-flats near the mouth of Umzimkulu River, Drège; Durban Flats, Buchanan 4; Umhlali, Wood 3992; and without precise locality, Gerrard 496; Buchanan 269.

This grass is very closely related to Panicum crus-galli, L., the "Barnyard or Cockshin Grass," and has been by some writers considered to be only a variety of it. P. crus-galli has also been found in Natal, but no specimens of it are in the Government Herbarium. As the difference between these two grasses are botanical only, it is quite probable that what is said of P. crus-galli as an agricultural grass will also apply to P. crus-pavonis. Baron F. v. Mueller says of it that it is a rich but annual grass, and that it does well along river banks and near stagnant water, and it was in such a locality that Wood's No. 3992 was collected. He also says that it will succeed in somewhat saline soil, particularly near brackish water-courses; also that on the Lower Mississippi it has furnished as much as four or even five tons of hay from an acre, and that cows and horses are very fond of it whether fresh or dry. Another writer on English grasses says "that it is of no agricultural value." It is, however, well known to farmers, by its popular name.

Fig. 1, Portion of rhachis with pedicels; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, upper valve; 7, pale enclosing ovary, style and stigmas; 8, ovary, style stigmas, stamens and lodicules. All enlarged.
PLATE 152.


Nat. Order Gramineæ.

Perennial.—Culms suberect or ascending, very slender, 1 to 1½ foot long, laxly branched, many noded, glabrous, internodes usually exserted.

Leaves glabrous or hairy; sheaths thin, tight, striate; ligule an obscure minutely ciliate rim; blades linear to lanceolate-linear from a suddenly contracted, often subauricled base, tapering to a fine point, 1 to 2 inches by 1½ to 2 lines, flat, thin, smooth, margins scabrid.

Panicle scanty, lax, erect, 2 to 4 inches long, axis filiform, smooth; branches very few, 2-nate or solitary, distant, at length spreading, the longer 1½ to 3½ inches long, simple or almost so, 5 to 2-spiculate, finely filiform to capillary, flexuous, smooth, pedicels ½ to 1 line long, tips subcupular.

Spikelets oblong, acute to subacuminate, about 1½ line long, greenish, glabrous or pubescent, prominently nerved.

Glumes, lower oblong, subobtuse, very slightly shorter than the upper, 5-nerved, margins and tip hyaline; upper glume similar, broader, subacuminate, 7-nerved. Lower floret barren. Valve equal to and like the upper glume, but 5-nerved. Pale half the length of the valve. Perfect floret oblong, acute or subacuminate, 1 to 1½ line long, yellowish. Valve subcoriaceous, 5-nerved, smooth. Anthers over ½-line long.

Habitat: Natal. Swampy places below 1000 feet alt., Drège; near Umpumulo, 2000 to 2500 feet alt., Buchanan 260.

Drawn from Buchanan’s No. 260, the only specimen in the Colonial Herbarium.

We have no information as to the value of this species, nor can we ascertain whether the natives have a distinctive name for it or not. The specimen from which it was drawn was very incomplete, neither stamens nor stigmas could be found.

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, upper valve; 6, pale; 7, mature ovary; 8, lodicule; 9, pedicels and spikelets; 10, portion of sheath, and blade of leaf with ligule. All enlarged.
PLATE 152.

PANICUM AÆQUINERVE, NEES.
PLATE 153.


Nat. Order Gramineæ.

_Perennial._—Culms ascending, divided above the base into somewhat spreading, long, leafy flowering branches, slender, 1\(\frac{1}{2}\) to 2 feet long, minutely hairy or glabrous, many-noded, internodes exserted; sheaths tight, thin, striate, hairy, often with tubercle-based hairs or glabrescent except at the nodes and near the junction with the blade; ligule a minutely ciliolate rim. Blades spreading, lanceolate from a rounded base, acutely acuminate, 1\(\frac{1}{2}\) to 3 inches, by \(\frac{1}{4}\) to \(\frac{1}{2}\) inch, flat, very thin, sparingly and finely hairy, margins scabrid.

Panicle erect, very lax, delicately and divaricately branched, about \(\frac{1}{2}\) foot long; axis filiform, terete and smooth below, angular and finely scabrid above; branches in fascicles of 4-2 or solitary, unequal, at length spreading, finely filiform to capillary, very laxly divided, often from 1 to 2 inches above the base; branchlets and pedicels extremely fine, scaberulous, lateral pedicels 1 to 4 lines long, tips scarcely thickened.

Spikelets oblong, acute at both ends, slightly more than 1 line long, glabrous, green.

Glumes, very thinly herbaceous; _lower_ broadly ovate, subobtuse, \(\frac{1}{2}\) line long, 3-nerved; _upper_ one somewhat remote from the lower, oblong, acute, almost 1 line long, 5-nerved, middle nerve scaberulous above. Florets, _lower_ barren; valve like the upper glume, but slightly longer; pale \(\frac{1}{2}\) the length of the valve. Perfect floret oblong, obliquely apiculate or acute, equally or slightly exceeding the upper glume; valve subcoriaceous, whitish, faintly 5-nerved; anthers \(\frac{1}{2}\) line long; grain obovoid, \(\frac{1}{2}\) line long, white.

_Habitat_: Natal. Shady woods near Durban, Drège 4289; coastland, Sutherland; and without precise locality, Gerrard 89; Berea, 150 feet alt, March, Wood 5936.

"The fruiting florets often separate from the remainder of the spikelet, which remains for a while attached to the pedicel, but falls at length as a whole. The habit is not unlike that of _Isachne albens_, Trin."

Drawn from Wood's specimen, the only one in the Government Herbarium.

Fig. 1, Portion of leaf with ligule; 2, pedicels and spikelets; 3, lower glume; 4, upper glume; 5, _lower_ valve; 6, pale; 7, _upper_ valve; 8, pale; 9, lodicules; 10, stamens, ovary style and stigma. _All enlarged._
PLATE 154.


Nat. Order Gramineae.

Perennial.—Culms rather slender, firm, ascending from an often long prostrate and rooting base, up to 8 feet long, and to 2 to 4 feet high, glabrous, many-noded, more or less branched.

Leaves, sheaths rather tight or the lower loose and deciduous, striate, glabrous or finely hairy to hirsute in the upper part, margins ciliate; ligule a ciliate membranous rim; blades obliquely erect or spreading, ovate-lanceolate, to lanceolate, rarely linear, from a rounded auricled or cordate base, acuminate or gradually tapering to an acute point, 3 to 7 inches, by \( \frac{1}{3} \) to 1 inch, flat, firm, glabrous, smooth or scantily dotted with small hairs on the upper surface, closely nervs and transversely veined near the base when broad, margins cartilaginous, scabrid to spinulous, often fimbriate at the base.

Panicle erect or slightly nodding, more or less contracted, lax, 4 to 8 inches long; axis slender, angular, glabrous or pubescent particularly at the nodes, angles smooth or scabrid; branches 4 to 8, rarely more, usually solitary, distant, suberect, 1 to 5 inches long, simple or shortly and sparingly branched from the base or near it, triangular, very slender to filiform, minutely tomentose at the base, internodes 2 to 8 lines long; lower pedicels 2-nate, unequal, upper solitary, the longer 1 \( \frac{1}{2} \) to 6 lines long, triangular, scabrid.

Spikelets oblong-ellipsoid, 2 to 3 lines long, turgid, glabrous, smooth, light green, usually obscurely nervs.

Glumes oblong, rather firm, subcarinate above, with callous, laterally compressed tips, lower shorter by \( \frac{1}{3} \) or less, 3-nerved, upper equaling the spikelet, 5-nerved. Florets, lower male; valve very similar to the upper glume; pale equal, acute; perfect floret equaling the male, oblong; valve coriaceous, smooth, shining, straw-coloured or whitish, 5-nerved; pale subauriculate near the base; anthers 1 line long.

Habitat: Natal. Without precise locality, Gerrard 480; Berea, 150 feet alt., March, Wood No. 5941.

Also in West Africa, India and tropical America.

Drawn from Wood's specimen, the only one in the Government Herbarium.

Fig 1, Portion of leaf with ligule; 2, lower glume, back view; 3, upper glume, back view; 4, lower valve, back view; 5, pale; 6, stamens and lodicules; 7, upper valve; 8, pale; 9, pistil, stamens and lodicules. All enlarged.
PLATE 155.


Nat. Order Gramineæ.

Perennial.—Culms from a very short rhizome or the tops of slender stolons, fascicled with few intravaginal innovation shoots, erect or geniculately ascending, 2 to 4 feet long, glabrous or finely pubescent below the nodes, sometimes hirsute towards the panicle, terete, 3 to 6-noded, subsimple or scantily branched, upper internodes more or less exserted. Leaves glabrous or sparingly (rarely densely) hirsute with tubercle-based hairs; sheaths rather firm, terete or subcompressed, striate, nodes pubescent; ligule a narrow membranous softly ciliate rim; blades linear to linear-lanceolate from a contracted and rounded or gradually attenuate base, long tapering to a very fine point, $\frac{1}{2}$ to $1\frac{1}{2}$ foot by 4 to 8 lines (rarely by 1 inch), flat, smooth except the scabrid margins, midrib rather stout, whitish.

Panicle erect or nodding, contracted or lax, 3 to 9 inches long; axis slender, angular, scabrid with fine tubercle-based hairs, often pubescent or subhirsute below the nodes, branches scattered or subopposite or scantily whorled, suberect or spreading, rather distant, up to 4 inches long, simple, laxly racemose, with 2-nate spikelets, or divided almost from the base, filiform, flexuous or strict, angular, very scabrid, sometimes with scattered hairs. Pedicels usually 2-nate, unequal, the terminal sometimes up to 6 inches long, filiform, scabrid, glabrous or with few long hairs.

Spikelets oblong, obtuse, turgid, 2 to $2\frac{1}{2}$ lines long, light green usually with purple or blackish tips, glabrous.

Glumes, lower membranous, obtuse or subacute, 1 to $1\frac{1}{2}$ line long, 5 to 7-nerved, sometimes purple at the base; upper one firmly membranous, oblong, 2 to $2\frac{1}{2}$ lines long, 7-nerved. Florets, lower male; valve ovate-oblong, obtuse, some what shorter than the upper glume; pale oblong, obtuse. Anthers $1\frac{1}{2}$ line long. Perfect floret exceeding the male and sometimes also the upper glume; narrowly oblong, obscurely and obtusely apiculate, yellowish, smooth, shining. Valve coriaceous, 5-nerved. Grain obvoid-elliptic, over 1 line long; hilum oblong, $\frac{1}{3}$ the length of the grain.

Habitat: Natal. By streamlets near Umpumulo, Buchanan 265a; Ubabi, Sutherland; near Durban, Williamson 17, 18; and without precise locality, Gerrard 483; Cooper 3342; Buchanan 265; Zululand, Jenkinson 97.

Drawn from Buchanan's 265 and 265a.

Mr. Jenkinson says of this grass: "Likely by cattle, only found in small patches." "This grass is very variable with respect to hairiness and the length of the pedicels."

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale. All enlarged.
PLATE 156.


Nat. Order Gramineae.

Perennial.—(Sometimes flowering the first year). Tufted, innovation shoots intravaginal, rhizome short, sometimes very stout.

Culms erect or geniculate, robust, usually tall, up to 10 feet long, compressed below, glabrous or the lower part more or less hirsute, usually 3 to 6-noded, sub-simple or more or less branched, branches erect, upper internodes exserted.

Leaves glabrous or softly hairy or coarsely hirsute with tubercle-base hairs; sheaths rather firm, the lower compressed, striate, nodes glabrous, pubescent or bearded; ligules membranous, very short, ciliate, and often with a dense beard behind; blades linear to lanceolate-linear from a contracted and rounded or attenuate base, long tapering to a fine (sometimes convolute and filiform) point, \( \frac{1}{2} \) to 2 feet by 2 to 8 lines, rarely broader; flat, minutely tomentose at the junction with the blade, midrib rather stout, whitish.

Panicule erect or nodding, contracted or diffuse and lax, decompound, from \( \frac{1}{2} \) to over 1 foot long, axis slender, angular, glabrous, smooth or scaberulous above; lower branches whorled, suberect or spreading, rather distant, up to 6 inches long, divided almost from the base, or undivided for 1 to \( 2\frac{1}{2} \) inches, filiform, scaberulous above, smooth below, glabrous except at the often minutely tomentose or pubescent callous base. Pedicels fasciiled, 3-2-nate or the upper solitary, very unequal, very short to several times longer than the spikelet, capillary, flexuous, seabbrid.

Spikelets oblong, subobtuse or obtuse, somewhat turgid, \( 1\frac{1}{4} \) to \( 1\frac{1}{2} \) line long, light green, sometimes tinged with purple, glabrous, rarely puberulous.

Glumes, lower rounded, \( \frac{1}{2} \) to \( \frac{3}{4} \) line long, subhyaline, faintly 3-nerved to nerveless, upper oblong, acute or subobtuse, \( 1\frac{1}{2} \) to \( 1\frac{3}{4} \) line long, membranous, 5-nerved. Florets, lower male, valve very similar to and very slightly shorter than the upper glume; pale oblong, obtuse; perfect floret equaling the male or scarcely shorter, oblong, obtuse, valve 5-nerved, finely transversely rugose. Anthers \( \frac{1}{2} \) to \( \frac{3}{4} \) line long. Gram over \( \frac{1}{2} \) line long.

Habitat: Natal. Common between 2000 and 2500 feet, Buchanan 263; Umpumulo, 2000 to 2500 feet, Buchanan 264; Hills near the Umlazi River, Krauss 183; Durban, Drège; McKen 100; Buchanan 30; by the Umzimkulu River, Drège; and between the Umkomandi River and the Umlazi River, Drège; Delagoa Bay, Forbes; near Maritzburg, St. George 13; near Dundee, Green 81; (Wood 7455); near Durban, Wood 5999.

Baron Mueller says of this grass:—"The 'Guinea grass,' Tropical Africa; elsewhere not indigenous. This perennial grass attains a height of 8 feet. It is highly nutritious, and quite adapted for the warmer temperate zone, being hardy as far south as Buenos Ayres. In Jamaica it is the principal fodder grass up to elevations of 5,000 feet, springing up over wide tracts of country almost to the exclusion of everything else. It forms large bunches, which, when cut young, supply a particularly sweet and tender hay; throws out numerous stolons; can be mown every six weeks; the roots can be protected in the ground against light frosts by a thin covering with soil. A favourite grass in tropical countries for stall fodder. . . . . It is necessary to guard against over-feeding with this grass solely. Succeeds even on poor clay soil and on sea sand."

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, stamens, pistil and lodicules. All enlarged.
PLATE 157.


Nat. Order Gramineæ.

**Annual.**—Culms fascicled, erect or ascending, 1 to 2½ feet long, glabrous, compressed to subterete, 3 to 5-noded, with flowering branches from most of the nodes.

Leaves glabrous; sheaths lax, mostly shorter than the internodes, pallid, striate; ligules membranous, up to ½ inch long, ciliate; blades linear, shortly tapering to a very acute point, 3 to 8 inches, by 2 to 3½ lines, suberect, flat or folded, light green, smooth.

Panicle erect, ovate, ½ to 1 foot long, very lax, open; axis slender, smooth; branches solitary or 2-3-nate, remote the longest up to ½ to ¾ foot long, repeatedly and very laxly divided from ½ to 1½ inch above the base, branchlets finely filiform to capillary, scaberulous, the ultimate divisions 2-spiculate; pedicels capillary, 2 to 4 lines long, tips clavate.

Spikelets oblong, obtuse, not compressed, slightly over 1 line long, pallid or tinged with purple, quite glabrous.

Glumes, lower much broader than long, claspig, very obtuse or subacuminate, ½ to ¾ line long; upper thin, subherbaceous, oblong, obtuse, slightly over 1 line long, 7 to 9-nerved. Florets, lower male; valve like the upper glume, 9-nerved; pale subequal to the valve; anthers ½ line long; perfect floret elliptic-oblong, subobtuse, 1 line long, whitish, quite smooth; valve obscurely 5-nerved. Grain oblong, obtuse.

**Habitat:** Natal. Van Reenen, 5-6000 feet alt., March, Wood 6014; near De Beers Pass, March, 5-6000 feet alt., Wood No. 5997; Shirley, Mooi River, 4-5000 feet alt., March, W. T. Woods; Mooi River, 5-6000 feet alt., March, Mason 36, (Wood 7319); near Dundee, 5-6000 feet alt., Green 36.

Drawn from Mason's 36, which was collected at “borders of cultivated land near Mooi River.”

Specimens of 4 indigenous grasses were received for determination from Mr. H. Ryle Shaw, editor of the “Agricultural Journal.” They proved to be *Digitaria sanguinale*, *Setaria aurea*, *Eleusine indica*, and the above described grass, *Panicum laevifolium*, Nees. These were collected by Mr. W. T. Woods, of Shirley, Mooi River, who for 40 years has been a stock farmer in Natal. He says of them: “Commonly known as ‘land grasses’ which appear on the bottom lands of Mooi River district when drained and cultivated. The yield is enormous, and the hay much preferable to that of the short hill veldt.” Of *P. laevifolium*, he says: “‘Buffalo Grass’ grows in tussocks 4 feet high, readily eaten by stock while green, and makes coarse but useful hay; easily cut by mower, grows on poor land.”

I would only add that the grass known in the coast districts as “Buffalograss” is *Setaria sulcata*, Raddi, formerly known here as *Panicum excurrens*, Nees.

Fig. 1, Portion of leaf with ligule; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, stamens and lodicules of male flower; 7, upper valve; 8, pale; 9, stamens, pistil and lodicules. *All enlarged.*
PLATE 158.


Nat. Order Gramineæ.

Perennial.—Culms ascending from a decumbent branched rooting base (always ?) rather stout, 2 to 3 feet long, terete, glabrous, 5 to many noded, sheathed all along or the upper 1-2 nodes exserted.

Leaves more or less glaucous; sheaths rather loose, glabrous, except at the pubescent nodes, or with scattered tubercle-based hairs; ligule a fringe of very short hairs; blades linear-lanceolate from a rounded contracted base, long tapering to a fine point, 4 to 8 inches, by 3 to 6 lines, glabrous except at the minutely villous junction with the sheath.

Panicle subpyramidal, 3 to 6 inches long, up to 4 inches wide; axis very slender, angular, glabrous or pubescent below the nodes, angles scaberulous at least in the upper part; branches usually, obliquely spreading, scattered or the lower opposite or subopposite, the upper simple or subsimple, racemose; the lower distantly branched almost from the finely tomentose base, more or less secund, filiform, scaberulous, the lowest up to 3 inches long; pedicels solitary or 2-nate, the longer up to 1 line long, filiform, scaberulous and usually with 1 to 3 fine long hairs, tips discoid.

Spikelets rather crowded, at least towards the tips of the branches and branchlets, ovate-oblong, acute to subacuminate, 1½ line long, glabrous, glaucous, contracted at the base into a very short stalk.

Glumes; lower minute, truncate or apiculate, hyaline, white or purplish; upper membranous, oblong; acute to subacuminate, faintly 5-nerved. Florets, lower male; valve like the upper glume; pale equal to the valve, oblong, anthers ½ line long; perfect floret oblong, obtuse or minutely apiculate; valve subcoriaceous, 5-nerved, whitish, very finely pitted; anthers up to 5 line long.

Habitat: Natal. Near the Umzimkulu River, Drège; banks of the Tugela River, Buchanan 266; Umhlanga, May, Wood 6057; 6062.

Drawn from Wood’s 6057.

I have no information as to the value of this grass as a fodder.

Fig. 1, Portion of rachis with spikelet; 2, lower glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, stamens, pistil and lodicules. All enlarged.
PLATE 159.

PANICUM PROLIFERUM. LAM.

Var. B longijubatum, Stapf.
PLATE 159.


Nat. Order Gramineae.

Perennial (?) tufted.—Culms erect or geniculate, very stout, spongy below, about 4 feet long; glabrous, smooth, many-noded, sheathed all along, or the upper nodes exserted, subsimple; sheaths loose, striate, glabrous; ligules, very short, membranous, densely ciliate; blades linear, long tapering to an acute point, up to 1 foot by 2 to 4 lines flat, smooth below, very scabrid above, sometimes with a few fine hairs, midrib whitish.

Panicle erect or nodding, decompound, narrow or rather open, large, 10 to 14 inches long; axis slender, sulcate, scabrid, at least upwards; branches subopposite, or partly solitary or the lower 3-4-nate at very unequal distances, the longest 6 to 10 inches long, undivided for 1 to 2 inches from the base, remotely branched filiform, subflexuous and, like the very fine branchlets, angular and usually very scabrid; pedicels usually 2-nate, unequal, suberect, the longer up to 2½ lines long, tips slightly thickened.

Spikelets oblong to oblong-lanceolate, acute to acuminate, scarcely compressed, 1¼ line long, greenish.

Glumes, lower hyaline, whitish, broadly clasping at the base, truncate, ¼ to ½ line long, obscurely 3 to 5-nerved; upper one thinly membranous below, oblong to oblong-lanceolate, acute to subacuminate, 1¼ line long, prominently 7 to 9-nerved. Florets, lower barren, valve like the upper glume; pale oblong subacute, 2-keeled, 1 line long; perfect floret narrowly oblong, acute, up to 1 line long, smooth, shining, yellowish; valve subcoriaceous, 7-nerved; anthers ½ line long. Grain over ½ line long, white.

Habitat: Natal. Near the Umzimkulu River, Drège; common near Um- pumulo, Buchanan 267; near Durban, Williamson 21; Zululand, Jenkinson 63 (Wood 7340).

Drawn from Jenkinson’s specimen.

A polymorphous species inhabiting India, South Africa, and the Atlantic side of America from Maine to the Argentine; elsewhere very rare and apparently introduced. The typical form occurs only in the Atlantic States of North America, and is distinguished by its annual duration, rather low growth, prolific ramification, and scantier nervation of the spikelets, the upper glume being 7 and the lower only 5-nerved.

Var. longijubatum occurs also on the River Shire in Nyassaland, whilst var. paludosum is common through India, in marshes and still waters.

Mr. Jenkinson says of it: “Grows in separate tufts.”

Fig. 1, Lower glume; 2, lower valve; 3, pale; 4, upper valve; 5, pale; 6, ovary and lodicules. All enlarged.
PLATE 160.


Nat. Order Gramineæ.

Perennial.—Culms erect or ascending from a geniculate, often decumbent and branched base, rather stout, 2 feet or more long, glabrous, 4 to 8-noded, internodes more or less exserted; sheaths striate, glabrous or more or less hirsute, with tubercle-based hairs, the upper rather tight; ligule a membranous minutely or obscurely ciliate rim; blades linear to lanceolate-linear from a usually widened and rounded base, tapering to an acute point, 5 to 8 inches, by $2\frac{1}{2}$ to $4\frac{1}{2}$ lines, flat, suberect, slightly rigid or sometimes flaccid, glabrous or sparsely hairy, glaucous or subglaucous, margins smooth or scaberulous, more or less tubercled towards the base.

Panicle erect or nodding, lax, 4 to 9 inches long; up to 6 inches broad when fully expanded; axis very slender, smooth, at least below; branches solitary, opposite or 2-4-nate, distant, the lowest 4 to 7 inches long, filiform to capillary, straight or flexuous, loosely divided from $\frac{1}{2}$ to $2\frac{1}{2}$ inches above the base, scaberulous or smooth below. Pedicels solitary or 2-nate, unequal, the longer 1 to $1\frac{1}{4}$ line with cupular tips.

Spikelets scattered or in scattered clusters, or more or less approximate, oblong, acute, 1 to $1\frac{1}{4}$ line long, glabrous, green or purple.

Glumes, lower very broadly ovate, acute, up to $\frac{1}{4}$ line long, 3 to sub-5-nerved; upper one oblong, subacut, prominently 7-nerved. Florets, lower one male; valve like the upper glume, sometimes very slightly longer, 9-nerved; perfect floret narrow, oblong, subacute, almost 1 line long, yellowish, shining, smooth; valve 7-nerved; anthers $\frac{3}{4}$ to $\frac{5}{8}$ line long.

Habitat: Natal. Banks of Tugela River, 600 feet, Buchanan 262.

Also in Bechuanaland, Transvaal, Nyassaland, Lower Zambesi, and Egypt.

Drawn from Buchanan’s specimen, which is very imperfect, but the only one we have.

The spikelets are very similar to those of $P. repens$, but on the whole smaller. This, together with the mode of growth and the more graceful and ample ramification of the panicle, makes the distinction of $P. coloratum$ from broad leaved forms of $P. repens$ easy. $P. coloratum$ of Jacquin (Ic. 1, 12), which is often quoted as synonymous with $P. coloratum$, Linn, is identical with $P. virgatum$, Linn, an American plant.

Fig. 1. Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, stamens, pistil and lodicules. All enlarged.
PLATE 160.

PANICUM COLORATUM. LINN.
PANICUM DREGEANUM. NEES.
PLATE 161.


Nat. Order Graminée.

PERENNIAL, tufted, innovation shoots intravaginal.—CULMS erect, slender, firm, 1 to over 2 feet long, glabrous, terete, with about 2 exserted nodes.

LEAVES mostly crowded at the base; sheaths tight, striate, ciliate, and usually villous at the junction of the blade, otherwise glabrous or sparingly and softly hairy, the lower very firm, fugaciously tomentose at the base, persistent; ligule a minutely ciliate rim; blades narrowly linear, gradually passing into and often distinctly narrowed towards the sheath, tapering to a fine point, 5 to 14 inches long by 1 to 2 lines wide, erect, usually convolute, sometimes flat, rigid, glabrous except the more or less hairy or villous base, scabrid, closely and prominently nerved.

PANICLE erect, more or less contracted, decompound, delicately branched, oblong, 4 to 8 inches long; axis slender, scaberulous; branches solitary, 2 or 3-nate or irregularly approximate, the longest 2 to 3½ inches long, and undivided for ½ to 1½ inch, then laxly branched, filiform, scabrid, branches subcapillary or capillary; pedicels solitary or 2-nate, unequal, the longer often up to 3 to 5 inches long, capillary, scabrid, tips subcapular.

SPIKELETS somewhat obliquely ovoid and obliquely acuminate, slightly over 1 line long, greenish or more or less purplish, gaping, prominently nerved.

GLUMES, similar, almost boat-shaped, ovate to oblong-ovate, acute or sub-acuminate, lower one about ½ to ¾ the length of the spikelet, often mucronulate, 5 to 7-nerved; upper one equalling the spikelet, 7-nerved. Florets, lower male; valve very similar to the upper glume, 5-nerved; pale equal to the valved, oblong, subacute, flaps very broad at the base. Anthers ½ to 1 line long; perfect floret oblong, obtuse, ¼ line long, smooth, shining, white or yellowish, tips sometimes purplish; valve subcoriaceous, very faintly 5 to 7-nerved.

Habitat: Natal. Mouth of the Umzimkulu River, Drège; near Durban, Drège; McKen 133; Williamson 25; Ingone, Sutherland; and without precise locality, Buchanan 117; 261; Gerrard 477; Berea, March, Wood 5939.

Drawn from Wood's 5939, and compared with Buchanan's 261.

Also in Nyassaland.

Fig. 1, Spikelet; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, stamens and lodicules; 7, upper valve; 8, pale; 9, stamens, pistil and lodicules. All enlarged.
PLATE 162.


Nat. Order Gramineae.

Perennial, compactly tufted; whole plant glabrous.—Culms erect, slender, wiry, $\frac{4}{5}$ to 1$\frac{1}{2}$ foot long, 1-2-noded, uppermost internode usually long exserted.

Leaves crowded near the base; sheaths terete, tight, firm, the lowest persistent; ligule an obscurely ciliolate rim; blades filiform, $\frac{1}{2}$ to over a foot long, $\frac{3}{8}$ to $\frac{1}{2}$ line thick, terete, acute, canaliculate, wiry, flexuous, very rarely partly flat, strongly nerved and sometimes minutely hairy on the upper surface, smooth.

Panicle erect, lax, contracted or open, 2 to 6 inches long; axis filiform, like the subcapillary or capillary branches, branchlets and pedicels smooth; branches mostly solitary or irregularly approximate, laxly divided from near the base, the longest $\frac{3}{4}$ to 2 inches long; pedicels solitary or 2-nate, very unequal, the longer 1 to 4 lines long, tips subcapular.

Spikelets turgid, broadly ovate to ellipsoid, obtuse, 1 line long, light green, sometimes tinged with purple, glabrous.

Glumes subequal, subherbaceous, very similar, elliptic, more or less obtuse, 5-nerved. Florets, lower male; valve like the glumes; pale subequal to the valve. Anthers $\frac{1}{3}$ to $\frac{5}{8}$ line long; perfect floret ovate, obtuse or subacute, $\frac{3}{4}$ to $\frac{4}{5}$ line long, white, smooth; valve coriaceous, faintly 5-nerved.

Habitat: Natal. Novelo Hills, 7000 feet alt., Sutherland; margins of woods near the Umlazi River, Krauss 188; Inanda, Wood 1592; and without precise locality, Buchanan 73, 258; Van Reenen, 5-6000 feet alt., December, Wood 7219; F. Lauth, Pearson's Falls, May; Zululand, Jenkinson, December (Wood 7310).

Drawn from Wood's 7219.

This grass is also found in Basutoland and Transvaal. Mr. Jenkinson gives the native name as Ntolwana.

Fig. 1, Lower valve; 2, pale; 3, stamens and lodicules; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PANICUM NATALENSE. Hochst.
PANICUM ECKLONII. NEES.
PLATE 163.


Nat. Order Gramineæ.

Perennial, compactly tufted, innovation shoots intravaginal.—Culms erect, very slender, 1 to 1 1/2 foot long, glabrous, 1-noded. 3 to 4 inches above the base, uppermost internode long exserted.

Leaves crowded at the base, strongly and closely nerved, more or less hirsute with tubercle-based hairs; sheaths tight, strongly bearded at the nodes and often at the mouth, the lower firm, persistent; ligule a ciliate rim; blades linear, acute, 1 1/2 to 5 inches long by 1 1/2 to 2 lines wide, rather firm, flat, margins very scabrid.

Panicle erect, linear to oblong, rather lax or contracted, 2 to 4 inches long; axis filiform, like all its divisions glabrous; branches alternate, or the lowest 2-nate, suberect, loosely divided almost from the base or from 1/4 to 1/2 inch above it, ultimate branchlets 4-1-spikelet, capillary, flexuous; pedicels 1 to 4 lines long, tips subclavate.

Spikelets oblong, obtuse, 1 1/4 to 1 1/2 line long, erect, glabrous, pallid or tinged with purple.

Glumes herbaceous, membranous, nerves running out into teeth; lower one broad, ovate, 1/3 to 1/2 the length of the spikelet, 3-nerved and 3-toothed; upper one oblong, 3 to 5-toothed, 5-nerved, equaling 3/4 to 4/5 the length of the spikelet. Florets, lower one barren, reduced to the valve, which is similar to the upper glume and 1 1/4 line long. Perfect floret, oblong, acute, equaling the lower floret; valve subcoriaceous, white or yellowish or purplish towards the minutely hairy, subrosulate tip, 7-nerved. Anther 1 line long.

Habitat: Natal. Karkloof, April, J. Wylie (Wood 6017); Mooi River, December, Mason 33 (Wood 7318).

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PLATE 164.

PANICUM INTERRUPTUM, WILLD. (Fl. Cap. Vol. VII., p. 413).

Nat. Order Gramineæ.

PERENNIAL. — Culms ascending from a creeping rooting base, 3 to 5 feet high, stout, very spongy, internodes mostly exserted.

Leaves glabrous; sheaths loose, striate, transversely veined, the submerged sometimes spreading, flattened and bladeless; ligules membranous, truncate, up to 1 line long; blades linear from a scarcely constricted base, long tapering to an acute point, 4 to 12 inches long, by 3 to 6 lines wide, flat, flaccid, very closely nervèd, scaberulous, margins scabrid.

Panicle erect, spike-like, cylindric, 6 to 12 inches long, by 3 1/2 to 5 lines wide; axis stout, sulcate, smooth; branches spirally arranged, very numerous, adpressed, filiform, smooth, up to 2 lines long, divided from the base or reduced to fascicles of disc-tipped pedicels.

Spikelets oblong, acute or subacute, sometimes slightly curved, 1 1/2 to 2 lines long, glabrous, olive-green with dark tips.

Glumes, lower one hyaline, almost orbicular, 1/4 to 1/3 the length of the spikelet, finely 5 to 7-nerved; upper one herbaceous-membranous, oblong, prominently 9-nerved. Florets, lower one barren; valve like the upper glume; pale about 3/4 the length of the valve, hyaline. Perfect floret, oblong obtuse, whitish or yellowish, 1 to 1 1/2 line long; valve chartaceous, obscurely 5-nerved. Anthers 1/2 line long.

Habitat: Natal. In stagnant water near Durban, Drège 4709; in similar situation, Durban Flat, Wood 3589.

Throughout tropical Africa and India to South China and Malaya.

Fig 1, Lower glume: 2, lower valve; 3, pale; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
OPLISMEenus AfrICAnus. BEAV.

Nat. Order Gramineæ.

PERENNIAL.—Culms ascending from an often long decumbent rooting base, 1 to 1½ foot high, slightly compressed below; sheaths rather tight, strongly striate, finely villous or ciliate along the outer margin, otherwise glabrous except a transverse villous line at the junction with the blade (in the African specimens), rarely more or less hirsute; ligules up to ½ line long; blades lanceolate from a slightly rounded base, acuminate, 2 to 5 inches by 4 to 7 lines (those of the lower leaves and barren shoots often much smaller and ovate-lanceolate), flat, thin, dull green, soft, scantily and minutely hairy to almost velvety below, scaberulous above, at least upwards, margins scabrid.

RACEMES 3 to 8 on an erect straight or flexuous, more or less 3-winged glabrous or finely hairy axis, the lower distant, erect or obliquely spreading, 3 to 9 lines long, rarely longer, the upper closer, much shorter or reduced to 2 or 3-spiculate clusters, the axis usually terminated by a solitary spikelet; rhachis of racemes straight, triangular, dorsally flat, greyish from very minute adpressed hairs, usually fringed with tubercle-based bristles (in the African specimens), tomentose or hispid at the base. Pedicels 2-nate or solitary, very short and stout, usually with a few bristles.

SPIKELETS ovate-oblong about 1½ line long, greyish-green or green, minutely bearded at the base.

GLUMES subequal, 1 to 1½ line long, thinly herbaceous, ovate to elliptic, produced into filiform subobtuse smooth more or less viscous, often purplish awns, hairy at least near the margins, rarely quite glabrous, lower 5-nerved, awn 3 to 6 lines long, upper 7 to 5-nerved, awn 1 to 2 lines long. Florets lower barren, rarely male, equalling the spikelet. Valve 9 to 7-nerved, obscurely or shortly mucronate. Perfect floret lanceolate-oblong, acute or obscurely cuspidate, 1 to 1½ line long, whitish, smooth, shining. Valve coriaceous, 7-nerved. Anthers ½ to ⅔ line long. Grain 1 line long.

Habitat: NATAL. Between the Umzimkulu and Umkomaas Rivers, Drège 4336; between Mapumulu and Riet Vlei, 2000 to 5000 feet alt., Buchanan 219; and without precise locality, Cooper 3378; var. simplex, Inanda, 1800 feet alt., Wood 1306.

Drawn from Buchanan's 219.

Usually found in shady woods.

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, pistil, stamens and lodicules. All enlarged.
Axonopus (Beauv.), Hook. f.

Nat. Order Gramineae.

Spikelets ovate to lanceolate-oblong, mucronate or awned, slightly or conspicuously compressed from the back, falling entire from the solitary, geminate or fascicled (and then very unequal) pedicels of more or less digitate or whorled racemes. Florets, lower male, upper perfect.

Glumes unequal, lower smaller, hyaline, 3 to 1-nerved, mucronate, acute or acuminate, upper equal or subequal to the spikelet, membranous, 5-nerved, mucronulate or muticous, submarginal nerves densely villous or ciliate. Valves subequal, lower resembling the upper glume, shortly or scantily villous or glabrous, upper chartaceous, glabrous or scantily ciliate, 5-nerved, produced into a mucro or short awn. Pales dissimilar, of the lower floret very short, hyaline, 2-partite, flaps auricled; of the perfect floret more or less equalling the valve, entire, 2-keeled, flaps very narrow, broadly auricled near the base. Lodicules 2, broadly cuneate. Stamens 3, styles distinct; stigmas laterally exserted. Grain enclosed by the rigid valve and pale, oblong, plano-convex; embryo about half the length of the grain; hilum basal, punctiform.

PLATE 166.


Perennial, compactly tufted.—Culms erect, 1 to 3 feet long, glabrous or more or less hairy, usually 2-noded with uppermost internode long exserted. Sheaths strongly striate, rather tight, more or less hairy, lowest fugaciously tomentose, firm, persistent; ligules very short, truncate. Blades linear from a slightly or distinctly narrowed base, acute, 3 to 12 inches, by 2 to 3 lines, flat, firm, rigid, strongly and closely nervet, softly hirsute with tubercle-based hairs.

Racemes 2 to 5, digitate or subdigitate, suberect, usually straight, rather stout and dense, often subsectund, 1 1/2 to 3 inches long, rarely longer, subsessile or some distinctly peduncled; rhachis slender, angular, hairy, at least below, pedicels mostly 2-nate, angular, scabrid or pubescent, very short, up to 2 lines long.

Spikelets ovate-oblong, 2 1/2 to 3 lines long, very slightly compressed, light green, usually tinged with purple or quite purplish.

Glumes lower ovate, mucronulate, 1/2 to 3/4 the length of the spikelet, glabrous or minutely pubescent at the tip; upper ovate-oblong, densely villous along the margins; valve of male floret finely woolly above, near the margins, of the perfect floret oblong, scantily and finely ciliate, produced into a fine mucro or short awn (up to 1 1/2 line long). Anthers up to 1 1/4 line long.

Habitat: Natal. Umphumulo to Riet Vlei, 2000 to 5000 feet alt., Buchanan 180; near Durban, Krauss 55; Inanda, 1800 feet alt., Wood 1593; Polela, 6000 to 7000 feet alt., Evans 521; and without precise locality, Gerrard 470.

Also in India. Drawn from Wood's 1593.

Fig. 1, Lower glume; 2, upper glume; 3, lower valva; 4, pale; 5, stamens and lodicules; 6, upper valva; 7, pale; 8, pistil, stamens and lodicules. All enlarged.
AXONOPUS SEMIALATUS. HOOK.

Var: Echlonii, Stapf.
Setaria, Beauv.

Spikelets ovate to oblong, falling entire from the pedicel, subtended by 1 to many persistent bristles (modified branchlets), which often form a one-sided involucre (see Section Ptychophyllum), subsessile in contracted spike-like or more or less open panicles. Lower floret male, or reduced to the valve, and a more or less arrested pale; upper floret perfect.

Glumes membranous, lower generally much smaller, usually 3 to 5 rarely 1 or 7-nerved; upper usually 5, sometimes 7-nerved. Lower valve more or less exceeding and resembling the upper glume; upper valve chartaceous to coriaceous, 5 nerved. Pales subequal to their valves or that of the lower floret more or less arrested, flat, 2-nerved, hyaline in the lower, of the same substance as the valve in the upper floret. Lodicules 2, broadly cuneate. Stamens 3. Styles distinct; stigmas laterally exserted. Grain tightly encased by the hardened valve and pale, oblong or ellipsoid; hilum basal, punctiform or orbicular; embryo about half as long as the grain.

Section 1, Ptychophyllum.—Blades long, plicately folded when young, at length opening out. Panicles almost spike-like or more or less open with elongated branches and crowded or somewhat distant spikelets; bristles solitary, terminating the branches and branchlets and usually also subtending at least a part of the lateral spikelets, or sometimes in fascicles at the base of the branches.

S. sulcata; S. Lindenberghiana.

Section 2, Eu-Setaria.—Blades not plicately folded when young; panicles usually spike-like and dense or compact, with very short (rarely elongated) branches; bristles often crowded into more or less one-sided involucres subtending solitary or clustered spikelets.

S. nigroirostris; S. Gerrardii; S. perennis; S. rigida; S. imberbis; S. verticillata.
PLATE 167.


Nat. Order Gramineæ.

PERENNIAL.—Culms erect or ascending from a short, prostrate and rooting base, stout, 5 to 12 feet high, compressed below, sometimes pubescent and scabrid close to the panicle, otherwise usually glabrous and smooth, 5 or more noded, sheathed almost all along or upper internodes exserted; sheaths long, rather tight, glabrous or hirsute, the lowest strongly compressed, subpersistent; ligule a densely ciliate rim; blades lanceolate to linear-lanceolate from a long and much attenuate or even petioled base, tapering to an acute point, 1½ to 3 feet long, by 1 to 3½ inches broad, closely plicately folded when young, then opening out (folds very numerous), glabrous or hairy, scabrid above towards the tip.

Panicle linear or linear-oblong, usually interrupted, 1 to more than 2 feet long, often nodding; axis angular, glabrous or puberulous, scaberulous above; branches solitary, irregularly approximate or almost whorled, ½ to 6 inches long, scabrid, spike-like, dense, bearing fascicles of spikelets below and solitary spikelets above, or the lower with similar more or less distant branchlets at the base; bristles solitary, fine, scaberulous, wavy, 1 to 8 inches long, terminating the branches and branchlets and at the base of some or most of the lower and middle spikelets; pedicels very short, scabrid, tips subdiscoid.

Spikelets oblong, acute, 1½ line long, glabrous, green or tinged with purple.

Glumes herbaceous-membranous, very broadly ovate, obtuse or subacute, lower 3-nerved, ½ to almost half as long as the spikelet; upper 5 to sub-7-nerved, ½ to 2/3 as long as the spikelet. Florets, lower barren, rarely male, equalling the upper or almost so; valve ovate-oblong, acute, 5 to sub-7-nerved, of the same texture as the glumes; pale slightly shorter than its valve or more or less reduced. Perfect floret oblong, acuminate, 1½ line long, tips often recurved; valve subcoriaceous, 5-nerved, pale or finally brown particularly upwards, smooth or very obscurely wrinkled. Anthers 2/3 line long.

Habitat: Natal. Near Durban, Drège; Berea, March, Wood 6927; Zululand 1500 feet alt., Jenkinson 54.

Drawn from specimens gathered on Berea, March.

Throughout tropical Africa and America.

This plant was formerly known in Natal as Panicum excurrens, Nees; it is a common grass on the coast and in the Midlands, is usually found at edges and in light bush; it is a coarse grass and not liked by cattle, in Natal often called "Buffalo Grass." The figure of the plant in the illustration is much reduced. Mr Jenkinson says of this grass: "Native name 'Ubabe' (Omkulu). Only found in small patches in shady and sheltered spots. Excellent fodder; keeps green through winter."

Fig 1, Fascicle of spikelets; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, upper valve; 7, pale; 8, pistil, stamens and lodicules. All enlarged.
SETARIA SULCATA. RADDI.
SETARIA LINDENBERGIANA, STAPP.
PLATE 168.


Nat. Order Gramineæ.

Perennial.—Culms erect, simple or branched near the base, slender, 2 to 3 feet long, glabrous or pubescent and sometimes with long soft hairs near the panicle, 5 or more noded with the lower internodes short and enclosed when simple. Branches few-noded. Sheaths tight, keeled above, striate, glabrous or hairy to hirsute, lower firm, persistent, often strongly compressed; ligule a ciliate rim. Blades linear or linear-lanceolate from a long attenuate base, tapering to a fine point, 3 to 12 inches, by 1½ to 6 lines, closely plicately folded when young, at length opening out (folds 8 to 12), usually glabrous, scaberulous above.

Panicle linear to oblong, usually almost spike-like, often interrupted or lobed, dense or lax, 2 to 6 inches long; axis angular, pubescent; branches alternate or irregularly approximate, 2 to 12 lines long, filiform, wavy, puberulous, simple or divided from near the base; bristles solitary, filiform, wavy, scaberulous, wavy, 1 to 5 lines long, terminating the branches and branchlets, or sometimes in fascicles at the base of the branches or solitary at the base of the lower spikelets; pedicels very short, tips discoid.

Spikelets ovate-oblong, acute, 1 to 1½ line long, glabrous, light green or tinged with purple.

Glumes membranous, broadly ovate, obtuse; lower 5 to sub-7-nerved, rather less than half as long as the spikelet; upper 7-nerved, equalling about ¾ the length of the spikelet. Florets, lower male, equalling the spikelet; valve membranous, broadly elliptic, obtuse, 7-nerved; pale subequal to the valve, with narrowly winged keels. Perfect floret elliptic-oblong, acute, equalling the lower floret; valve subcoriaceous, 5-nerved, pallid or purplish, particularly upwards, finely and closely transversely wrinkled. Anthers ½ line long.

Habitat: Natal. Inanda, 1800 feet alt., Wood 1419; in shady woods by the Umgeni River, Krauss 130.

Also in Cape Colony, Orange River Colony, and in Tropical East Africa.

Fig 1, Portion of rachis; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, stamens and lodicules; 7, upper valve; 8, pale; 9, pistil, stamens and lodicules. All enlarged.
PLATE 169.


Nat. Order Gramineæ.

Perennial, rhizome short, oblique, praemorse.—Culms erect or subgeniculate, slender, \( \frac{1}{2} \) to more than 2 feet long, compressed, pubescent and scabrid just below the panicle and usually more or less tomentose below the nodes, otherwise glabrous and smooth, 1 to 3-noded, internodes usually enclosed except the uppermost. Sheaths tight, firm, strongly striate, glabrous except on the ciliate margins and tomentose nodes, or sparingly hairy, lowest short and fugaciously hairy like the innovation bud-scales, very firm, persistent, dark brown; ligules very short, ciliate. Blades linear to linear-lanceolate, often with a gradually narrowed base, tapering to an acute point, 4 to 9 inches (rarely more) by 3 to 4 lines, rather firm, flat or involute, glabrous, smooth or margins scaberulous.

Panicle spike-like, cylindric, stout, rather dense, sometimes interrupted, 1 to 5 inches, by 3 to 5 lines; axis angular, finely villous; branches reduced to sessile clusters of 2 or 3 spikelets or to a single spikelet, each subtended by a fascicelike of 3 or 4, or if solitary, by as many as 8 coarse subflexuous scaberulous bristles, \( 2\frac{1}{2} \) to \( 4\frac{1}{2} \) lines long with slightly thickened almost smooth and blackish tips; pedicels stout, very short, tips discoid.

Spikelets turgid, obliquely ovoid, \( 1\frac{1}{2} \) to \( 2\frac{1}{4} \) lines long, pale with dark tips, glabrous.

Glumes firmly membranous, lower broadly ovate, acute, about half as long as the spikelet or slightly longer, 5-nerved; upper oblong, very concave, subapiculate, almost as long as the spikelet of shorter by \( \frac{1}{4} \) or \( \frac{1}{5} \), 7-nerved. Florets, lower male; valve equalling the upper floret, oblong, subapiculate, 5-nerved; pale equalling the valve. Perfect floret elliptic-oblong, slightly beaked; valve 5-nerved, very convex, finely honeycombed, yellowish, beak purple or blackish; anthers 1 to 1\( \frac{1}{4} \) line long.


Drawn from Wood's 4096, and compared with Buchanan's 174.

Fig. 1, Portion of leaf with ligule; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, stamens and lodicules; 7, upper valve; 8, pale; 9, pistil, stamens, and lodicules. All enlarged.
SETARIA NIGRIROSTRIS. DUR. & SCH.
SETARIA GERRARDII. STAFF.
PLATE 170.


Nat. Order Gramineæ.

Perennial, rhizome short, praemorse, oblique.—Culms erect, 2½ to 3½ feet long, compressed below, villous close to the panicle, otherwise smooth and glabrous, 2 to 4-noded, internodes usually long exserted, except the lowest. Sheaths tight, striate, glabrous except on the ciliate margins and very finely silky nodes, lower compressed, keeled, pallid or purplish, firm, persistent, fugaciously hairy at the base, 2 to 6 inches long; ligule a very densely and long ciliate rim. Blades narrow, linear, tapering to a very long fine point, over 1 foot by 1½ to 2 lines (unfolded), usually folded or involute above, flexuous, glaucous, glabrous, margins cartilaginous, scabrid.

Panicle spike-like, cylindric, dense, 1½ to 3 inches, by 3 to 4 lines; axis subvillous, branches reduced to subsessile clusters of 2-3 spikelets or to a single spikelet, each spikelet subtended by a fascicle of 3 4 or, if solitary, by 6-8 slender subflexuous bristles, 4-6 lines long, purple from the middle, scabrid all along, pedicels very short, tips discoid.

Spikelets obliquely ovoid, 1½ to 1½ line long, whitish, glabrous.

Glumes firmly membranous, lower one ovate, acute, about half as long as the spikelet, 5-nerved; upper one oblong, very concave, subapiculate, shorter than the spikelet by ¼, 7-nerved; lower floret male; valve equalling or slightly exceeding the upper floret, oblong, 5-nerved, subapiculate; pale equal to the valve. Perfect floret elliptic-oblong, slightly beaked, 1½ line long; valve very convex, 5-nerved, very finely honeycombed, pallid, sometimes with a dark spot near the tip. Anthers almost 1 line long.

Habitat: Natal. Without precise locality, Gerrard 681; Buchanan 224; Umhlanga, May, Wood 6063; Zululand, January, Jenkinson 59 (Wood 7338); Green, Dundee, March.

Fig. 1, Cluster of spike'ets; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, stamens and lodicules; 7, upper valve; 8, pale; 9, pistil, stamens and lodicules. All enlarged.
PLATE 171.


Nat. Order Gramineæ.

**Perennial**, densely caespitose.—**Culms** erect, very slender, 8 to 16 inches long, slightly compressed below, 2 to 3-noded, simple, finely puberulous or scaberulous close to the panicle, otherwise smooth, internodes enclosed or slightly exserted except the uppermost. Sheaths terete, tight, glabrous, or sparingly hairy, lowest very firm, closely and strongly striate, persistent; ligule a minutely ciliolate rim; blades erect, very narrow, linear, tapering to a very fine point, usually setaceously convolute, 2 to 8 inches, by $\frac{1}{2}$ to $\frac{3}{4}$ line (rarely 1$\frac{1}{2}$ line when expanded), rigid, with scattered very fine spreading hairs.

**Panicle** spike-like, cylindric, very dense, $\frac{3}{4}$ to 2 inches, by 2 to 3 lines; axis, puberulous; branches reduced to a single spikelet subtended by a subsessile one-sided involucre of 4 to 6 fine subequal scaberulous bristles, 2 to 3 lines long, purplish or yellow above.

**Spikelets** oblong, acuminate, apiculate, $1\frac{1}{2}$ line long, pallid, glabrous.

**Glumes** membranous, lower broadly ovate, acute or subacute, about half as long as the spikelet or slightly longer, 3-nerved; upper ovate-oblong, acute or acuminate, shorter than the spikelet by one-half, 5-nerved; lower floret male; valve oblong, acuminate or apiculate, $1\frac{1}{2}$ line long, 5-nerved; pale slightly shorter than the valve; perfect floret slightly shorter than the male, elliptic-oblong, apiculate, pallid; valve very finely and closely transversely wrinkled, 5-nerved, tips obscurely 3-toothed or mucronulate. Anthers over half line long.

**Habitat**: Natal. Dundee, 4-5000 feet alt., Green (Wood 7357); Dundee, Green 54 (Wood 7361); near Maritzburg, St. George 5a (Wood 7242); near Verulam, 500 feet alt., November, Wood 8647.

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6, upper valve; 7, pale; 8, pistil, stamens and lodicules. *All enlarged.*
SETARIA RIGIDA. STAFF.
PLATE 172.


Nat. Order Gramineae.

Perennial.—Culms erect, rather stout, over 2½ feet long, more or less compressed or angular, glabrous, very rough below the panicle. Sheaths long, rather tight and firm, smooth, glabrous except at the bearded mouth or along the ciliate margin; ligules truncate, very short, densely ciliolate. Blades erect, very narrow, linear, subpungent, half to more than 1 foot long; 1 to 1½ line wide (unfolded), rigid, folded (or involute in the upper part), sparingly hairy towards the base, margins rough.

Panicle spike-like, cylindric, sometimes sub-interrupted, 5 to 9 inches, by 3 lines, coarsely bristly; axis subangular, hairy; branches reduced to subsessile clusters of 5 to 8 partly arrested spikelets, each of which is subtended by one coarse scabrid subflexuous bristle, 3 to 5 lines long. Pedicels very short, tips cupular.

Spikelets oblong, acute or subacute, slightly curved, slightly over 1 line long, straw-coloured.

Glumes, lower ovate or almost round, obtuse or acute, less than ½ line long, hyaline, 3-nerved; upper similar, ¹/₂ to ³/₄ line long. Florets, lower barren, equalling the upper; valve oblong, membranous, 5-nerved; pale 0. Perfect floret oblong; valve subcoriaceous, very finely punctate, 5-nerved. Anthers over ½ line long.


Drawn from Jenkinson's specimen and compared with Buchanan's 173.

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PLATE 173.


Nat. Order Gramineæ.

Annual.—Culms often copiously fascicled, ascending from a geniculate base, slender, ½ to 3 feet long, branched, terete or compressed below, deeply grooved and compressible in the upper part where they are sometimes swollen and very finely villous or puberulous and scabrid, otherwise glabrous and smooth, 3 to 7-noded. Internodes slightly exserted or at length slipping out of the sheaths; sheaths striate, glabrous; ligules very short, membranous, truncate, up to ½ line long, ciliate; blades narrow, linear, long, tapering to an acute point, 2 to 6 inches long by 1 to 3 lines wide, flat, flaccid, glabrous (in the African specimens), rarely slightly rigid and involute and with long scattered hairs, finely scaberulous.

Panicle erect, straight or flexuous, cylindric, slender, ½ to 3 inches long by about 2 lines wide, dense; axis slender, minutely villous or puberulous; branches reduced to a subsessile one-sided involucre of 3 to 8 fine scabrid bristles, 1½ to 4 lines long, palid below, fulvous or reddish above, and subtending usually one perfect and often one arrested spikelet.

Spikelets elliptic-oblong, minutely apiculate or obtuse, 1 to 1½ line long, pallid or purplish at the tips, glabrous.

Glumes very thin, membranous, ovate, acute or subacute, whitish, lower 3-nerved, rather less than half as long as the spikelet; upper 5-nerved, rather more than half as long as the spikelet, nerves green; lower florets equal, lower barren or male; valve equalling the spikelet, flat, similar to the upper glume; pale subequal to the valve; perfect floret plano-convex, ovate-elliptic, usually minutely apiculate, pallid or purplish at the tips; valve coriaceous, transversely wrinkled, 5-nerved. Anthers ½ line long.

Habitat: Natal. Greytown, 3000 feet alt., Buchanan 177; near the Tugela River, 3000 feet alt., Buchanan 176; and without precise locality, Buchanan 177c; Van Reenen, 5-6000 feet alt., March, Wood 5991.

Also in the Mascarene Islands and in Tropical East Africa; very common throughout Tropical America.

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, upper valve; 6, pale; 7, pistil, stamens and lodicules. All enlarged.
SETARIA VERTICILLATA. BEAUV.
PLATE 174.


Nat. Order Gramineae.

ANNUAL.—Culms erect or ascending from a geniculate base, ½ to 5 feet long, usually compressed below, more or less branched, glabrous, smooth, or scabrid below the panicle, 4 to 9-noded, internodes mostly at length exserted; sheaths thin, rather lax, usually compressed, striate, glabrous, or finely hairy upwards; ligules short, truncate, densely ciliate; blades linear or lanceolate-linear from a broad and rounded, or from a narrow base, long tapering to an acute or subsetaceous point, 2 to 12 inches, by 2 to 6 (rarely up to 12) lines wide, thin, flat, flaccid, scaberulous, usually finely and scantily hairy.

Panicle erect or curved, spike like, cylindric or oblong, dense or rather lax, 1 to 5 inches long, coarsely bristly; axis scabrid and often pubescent; branches spirally arranged, close, in robust specimens, the lower up to 4 lines long, with a distinct scabrid angular rhachis and 2-nate spikelets, otherwise very short or reduced to sessile clusters, each spikelet subtended by a coarse reversely scabrid bristle 2 to 7 lines long.

Spikelets ellipsoid, obtuse, about 1 line long, light green, glabrous, lower glume hyaline, broad, ovate, acute, 1 to sub-3-nerved, ¼ to ⅔ as long as the spikelet, upper membranous, elliptic, concave, 5 to 7-nerved, equal to the spikelet or almost so; lower floret barren; valve similar to the upper glume, dorsally flattened, 5 to 7-nerved; pale hyaline, more or less arrested or 0. Perfect floret elliptic-oblong, plano-convex, subapiculate or obtuse, almost 1 line long, greenish or straw-coloured; valve subcoriaceous, very obscurly wrinkled, 5-nerved. Anthers ⅔ line long; grain broadly ellipsoid, over ⅓ line long, white, subtranslucent.

Habitat: Natal. Durban Flat, Buchanan; near Durban, Williamson 14; Umbumulo and near the Coast, Buchanan 165; and without precise locality, Gerrard 682; Zululand, Jenkinson 4; Berea, March, Wood 5946.

Fig 1, Branch with spikelets; 2, lower glume; 3, upper glume; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PENNISETUM, Pers.

Nat. Order Gramineæ.

SPIKELETS oblong or lanceolate, solitary or in clusters of 2 to 4, subtended by and deciduous with sessile or peduncled involucre of naked or plumose bristles (rarely reduced to a solitary bristle in Section Beckeropsis), and arranged round the axis of spike-like usually cylindric panicles, lower floret male or barren with or without a pale; upper perfect.

GLUMES usually small and hyaline, lower sometimes suppressed, upper rarely ½ the length of the spikelet or more, and then several to 7-nerved. Valves equal or subequal, membranous to chartaceous, 5 to 7-nerved, or the lower more or less reduced, thinner, fewer nerved. Paleæ subequal to the valve and of similar texture, 2-nerved, or more or less reduced in the lower floret. Lodicules small, usually in front and outside the pale or 0. Stamens 3. Styles distinct, slender or connate. Grain enclosed by the slightly changed valve and pale (see also P. typhoideum), broadly oblong, slightly dorsally compressed to subglobose; hilum basal, punctiform; embryo large, ½ to ¾ the length of the grain.

Section 3, Gymnathrix.—Involucre sessile; spikelets usually solitary, rarely 2-3 in each involucre; bristles never plumose; anther tips usually naked; styles almost free or more or less connate or cohering to ½ their length, rarely higher up.

PLATE 175.


PERENNIAL.—CULMS branched near the base, over 1½ foot long, sheathed all along (or the lowest internodes at length naked), firm, smooth and glabrous. Leaves quite glabrous, glaucous. Sheaths firm, glabrous, finely striate, tight or the uppermost slightly tumid; ligule a fringe of short silky hairs. Blades linear, long tapering to a fine or setaceous point, ½ to almost 1 foot, by 1 to 3 lines, firm, rather rigid, and generally convolute, smooth except the cartilaginous scabrid margins.

PANICLE spike-like, slender cylindric, 5 to 8 inches, by about 3 lines, pallid; rhachis slender, scaberulous like the very short pedicels. Involucres of numerous pallid slender scabrid bristles of unequal length, the longer half as long again as the spikelet, one conspicuously stouter and much longer than the rest.

SPIKELETS solitary, ovate-oblong, slightly over 1½ line long, pallid or purple at the tips, glabrous.

GLUMES hyaline, lower very minute, nerveless, upper ovate, acuminate, less than ½ line long, 1-nerved. Lower floret male; valves very similar, broadly ovate-oblong, suddenly and shortly acuminate, or the upper mucronate, 5-nerved; lodicules small but distinct; anthers not quite 1 line long, tips acute, naked; styles connate at the very base.

Habitat: NATAL. Umpumulo, Buchanan 172.

Drawn from Buchanan’s 172, the only specimen in the Herbarium.

Fig. 1, Spikelet; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, pale of upper valve; 7, pistil, stamens and lodicules. All enlarged.
PENNISETUM NATALENSE. *Stapf.*
PENNISETUM SPHACELATUM. DUR. & SCHINZ.
PLATE 176.


Nat. Order Gramineae.

Perennial.—Culms on a short oblique rhizome, slender, 1 to 3 feet high, about 3-noded simple, rough and pubescent or adpressedly hirsute below the panicle, otherwise glabrous and smooth, internodes mostly exerted, the uppermost often very long. Sheaths firm, lower crowded, short, at least on the innovation shoots, persistent, striate, glabrous, or pubescent along the margins and near the mouth; ligule a fringe of short silky hairs.

Blades very narrow, linear, filiform-convolute, 2 to 8 inches by \( \frac{3}{4} \) to \( \frac{1}{2} \) lines, firm, flexuous, glabrous or hairy towards the base, rough in the upper part.

Panicles cylindric, very dense, erect or nodding, 2 to 4 inches, by 3 to 4 lines, pallid or slightly purplish; rhachis slender, scabrid or pubescent like the very short pedicels; involucre of numerous pallid, slender, scabrid bristles of unequal length, the longer half as long again as the spikelet or longer, one usually longer and stouter than the rest.

Spikelets solitary, lanceolate, acuminate to subulate-acuminate, \( \frac{13}{4} \) to \( 2\frac{1}{2} \) lines long, glabrous, pallid, tips usually purplish.

Glumes very small, lower often suppressed, obtuse or acute, hyaline, nerveless or upper 1-nerved. Florets equal or the lower which is reduced to an empty valve slightly shorter; valves oblong-lanceolate, subulate-acuminate, 5-nerved or the lower 3-nerved; lodicules sub-quadrate. Anthers about 1 line long, tips naked; styles connate at the very base.

Habitat: Natal. Umsinga and the base of the Biggarsberg range, Buchanan 107; Reit Vlei, 4000 feet alt., Buchanan 171; and without precise locality, Buchanan 63, 72, 75; Van Reenen, 5000-6000 feet alt., March, Wood 5989; marshy ground Mooi River district, 4000 feet alt., December, Mason 50 (Wood 7322).

Drawn from Wood's 5989.

Fig 1, Spikelet; 2, upper glume; 3, lower valve; 4, upper valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PLATE 177.


Nat. Order Gramineae.

Perennial.—Culms from a rather slender rhizome, ascending, conspicuously geniculate, slender, compressed below, $\frac{3}{4}$ to $1\frac{1}{2}$ foot long, about 2-noded, smooth, glabrous or pubescent below the panicle; upper inter-nodes exserted, uppermost often long.

Leaves for the most part crowded at the base, glabrous except a hairy line at the junction of blade and sheath, rarely hairy all over, except towards the base of the sheaths. Sheaths firm, lower short, persistent, striate, keeled or ultimately rounded, upper long, loose or subtumid; ligule a dense silky fringe of short hairs.

Blades linear, tapering to an acute point, 2 to 3 inches (rarely more) by 2 to 3 lines, keeled and folded or flat and involute, rigid, rather dull green, smooth except towards the tips and along the scaberulous margins.

Panicle cylindric, very dense, erect, $1\frac{1}{2}$ to 2 inches, by 3 to 5 lines, purplish; rhachis scabrid; pedicels obsolete; involucres of very numerous and very fine scaberulous bristles, purplish above, of unequal length, the longer sometimes twice as long as the spikelet.

Spikelets solitary, oblong-lanceolate, $1\frac{1}{2}$ to 2 lines long, pallid, glabrous.

Glumes, lower suppressed, upper very minute, hyaline, nerveless. Florets, lower reduced to an ovate acuminat 1 to 3-nerved valve of about half the length of the perfect floret and usually with a short fine bristle; fertile valve ovate-oblong, abruptly mucronate, acuminate, 5 to sub-7-nerved; lodicules 0 or very minute. Anthers about 1 line long, tips minutely bearded; styles almost free, although often more or less cohering.

Habitat: Natal Van Reenen, 5000-6000 feet alt., December, Wood 7220; variety Galpinii, without precise locality, 4000 to 5000 feet alt., Buchanan 85.

Drawn from Wood's 7220, but the anthers had all fallen away.

Fig 1, Lower valve; 2, upper valve; 3, pale; 4, pistil and lodicules. All enlarged.
PLATE 178.


Nat. Order Gramineæ.

Perennial.—Rhizome short, premorse; innovation buds rather stout, acute, firm, ovate, striate, ciliate scales.

Culms 3 to 12 feet high, erect branched, particularly from upper nodes, or simple below, terete, or rarely semiterete in the lower and subtriquetrous in the uppermost internodes, very firm, obscurely striate, glabrous, glaucous, nodes 8 or more, longest internodes ¼ to 1 foot long; sheaths strong, the lower and middle as long as the internodes or shorter, ultimately spreading, the upper longer, tighter, glabrous except the usually ciliate mouth and the sometimes hairy nodes; ligules very short and ciliate or a fringe of hairs; blades lanceolate-linear from a usually big-narrowed base, or petioled, long tapering to a setaceous point, the longest from 1½ to 1 foot, by 3 to 10 lines, rather firm, glaucous, scabrid above, sometimes shortly and sparingly hairy, margins very rough.

Racemes on long very slender peduncles, 1 or several from the upper nodes, sometimes very numerous, ½ to 2 inches long; rhachis angular, scabrid.

Spikelets subimbricate, oblong or lanceolate-oblong, acute, 1¼ to 1½ line long, often purplish, basal bristles ½ to 10 lines long.

Glumes reduced to a minute rounded or truncate nerveless scaberulous scales, lower 1/6 to ½, upper ¼ to ½ line long; lower floret reduced to a valve minutely ciliate below the tip, otherwise scaberulous or almost smooth, firmly membranous, finely 5-nerved, margins obscurely inflexed in the upper third; upper valve similar to the lower, glabrous; pale almost as long as the valve, hyaline, 2-nerved; lodicules broadly cuneiform, fleshy, 1/10 line long; anthers ⅛ to ⅙ line long; grain unknown.

Habitat: Natal. Near Durban, in coffee gardens, Drège; Umpumulo, 1500 to 2000 feet alt., Buchanan 220, 221; Umhlanga, 3 to 500 feet alt., Wood 6059.

Drawn from Wood's 6059, and compared with Buchanan's 220, 221.

Fig 1, Spikelet; 2, lower valve; 3, upper valve; 4, pale; 5, pistil, stamens and lodicules. All enlarged.
Tricholena, Schrad.

Spikelets oblong, laterally compressed, more or less gaping, panicked. deciduous from capillary pedicles. Florets, lower usually male or barren, upper perfect. Glumes very dissimilar or at least unequal, lower reduced to a minute scale or obsolete, very rarely half the length of the spikelet, somewhat remote from the upper; upper one membranous, emarginate, muticous or finely mucronate or aristate from the sinus, 5-nerved, usually hairy. Valves very dissimilar, lower like the upper glume with a hyaline 2-nerved subequal pale, upper much smaller, thinly chartaceous, glabrous, shining, obtuse or sub-emarginate, obscurely 5-nerved, with an equal 2-nerved pale of similar substance. Lodicles 2, very small. Stamens 3. Style free, slender; stigma densely plumose, laterally exserted. Grain oblong-ellipsoidal, closely embraced by the valve and pale; hilum basal, punctiform; embryo about half the length of the grain.

PLATE 179.

Tricholena setifolia, Stapf. (Fl. Cap., Vol. VII., p. 442).

NAT. ORDER Gramineae.

Culms in compact tufts, with numerous intravaginal innovation shoots, erect or geniculate, \(\frac{2}{3}\) to \(1\frac{1}{2}\) foot long, rather slender, glabrous, 2 to 3-noded, upper internodes more or less exserted.

Leaves mostly crowded at the base: lower sheaths compressed, keeled, firm, striate, hairy to tomentose, at least towards the base and the margins (hairs spreading or adpressed) at length often glabrescent, persistent, upper glabrous except at the villous nodes; ligule a dense fringe of very short hairs.

Blades filiform, setaceous convolute, flexuous, 4 to 8 inches (rarely 12 inches) long, glabrous or hairy.

Panicle contracted, linear, often spike-like, usually flexuous or nodding, 2 to 4 inches long, silky; rachis slender, scabrid or hairy in the upper part and below the nodes; branches solitary or 2-nate, filiform, flexuous, loosely divided almost from the base, erect, like the subcapillary branchlets and pedicles, usually dark and finely hairy, tips slightly thickened with slightly longer hairs.

Spikelets oblong, 2 to \(2\frac{3}{4}\) lines wide, very densely villous with shining white or purple hairs, bearded at the base.

Glumes, lower, oblong obtuse, less than \(\frac{1}{2}\) inch long, hyaline, quite hidden by hairs; upper equalling the spikelet, subchartaceous, oblong, minutely emarginate with a mucro or short awn from the sinus, 5-nerved, densely villous with the hairs increasing in length from the base to beyond the middle, then glabrous towards the apex except along the ciliate margins, hairs usually adpressed and exceeding the spikelet by 1 to \(1\frac{1}{2}\) lines. Florets, lower male or barren; valve equal and very similar to the upper glume; pale hairy; perfect floret oblong to linear-oblong, 1 to \(1\frac{1}{2}\) line long, glabrous, shining; valve obtuse, subemarginate, faintly 5-nerved, membranous; anthers \(\frac{3}{4}\) line long.

Habitat: Natal. At the foot of Table Mountain, Krauss 382; by the Umbholi River at Oakford, Rehmann, 8456; Biggarsberg Range, Rehmann 7036; Inanda, Wood 1395; Pietermaritzburg, 2000-3000 feet alt., Sutherland; Umbumulo, Buchanan 298, in part; and without precise locality, Buchanan 86; Durban Flat, 20 feet alt., Wood 8953; Dundee, 4000-5000 feet alt., December, Green 69.

Fig. 1, Lower glume; 2, lower valve; 3, pale; 4, upper valve; 5, pale; 6, pistil, stamens and lodicles. All enlarged.
TRICHOLÆNA ROSEA. NEES.
PLATE 180.

Tricholena rosea, Nees. (Fl. Cap., Vol. VII., p. 443).

Nat. Order Gramineae.

Perennial or Annual.—Culms laxly fascièd, rarely densely tufted, usually geniculate, 1 to 1½ foot long, simple or scantily branched below, terete, glabrous or sometimes hirsute from tubercle-based hairs, 3 to 4-noded. Sheaths terete or the lower slightly compressed, glabrous except at the villous nodes or hirsute from usually tubercle-based hairs, 3 to 4-noded. Sheaths terete, or the lower slightly compressed, glabrous except at the villous nodes, or hirsute from usually tubercle-based hairs.

Blades linear, long tapering to a subsetaceous point, 2 to 8 inches by 1 to 4 lines, rarely broader or narrower, flat, often spreading and rather flaccid, rarely convolute, glabrous or sometimes scantily hairy, rough above.

Panicle oblong to ovoid, lax or contracted, 3 to 6 inches long, straight or flexuous; rachis slender, finely scaberulous; branches fascièd or 2-nate, finely filiform, undivided below or laxly branched almost from the base; branchlets and pedicels finely capillary, flexuous, glabrous or more or less hairy, scaberulous, tips thickened with long fine hairs (up to 2 lines long).

Spikelets oblong, about 2 lines long, villous from shining white or purple hairs, shortly bearded at the base.

Glumes, lower oblong, obtuse, about ¼ line long, hyaline, almost hidden by hairs; upper equalling the spikelet, semi-ovate, more or less gibbous below the middle and slightly narrowed into an oblong beak, obtusely 2-lobed or emarginate, with or without a mucro or a short fine awn from the sinus, subchartaceous, often olive-brown, villous with the hairs increasing in length from the base to beyond the middle, then glabrous except the ciliate margins; hairs often springing from minute or sometimes coarse and partly confluent tubercles, adpressed or sometimes spreading, usually exceeding the tips of the glume. Florets, lower male or barren; valve equal and very similar to the upper glume; pale more or less hairy. Perfect floret ½ line long, elliptic-oblong, obtuse, glabrous; valve emarginate, faintly 5-nerved, membranous. Anthers over ¼ line long. Grain obovoid, brown, ½ line long.

Habitat: Natal. Near Durban, Plant 98; Drakensberg, Rehmann 7175; near Umpumulo and Reit Vlei, common, Buchanan 298, in part; without precise locality, Gerrard 461; Buchanan 122; Berea, February, Wood 8881; Berea, September, Wood, 9042.

A common grass all over the Colony, seeds have been sent to India and other places, and it is thought to be a good fodder grass, but in Natal it does not seem to be much esteemed. It is known abroad as the "Natal Red-top Grass," but it is also found in Transvaal and Cape Colony. The native name is um-Kuana.

Fig 1, Lower valve; 2, pale; 3, upper valve; 4, pale; 5, pistil, stamens and lodicules. All enlarged.
PLATE 181.

Tricholana Glabra, Stapf. (Fl. Cap., Vol. VII., p. 446).

Nat. Order Gramineae.

Perennial — Culms densely fascicled, erect or subgeniculate, slender, branched and wiry below, 1 to 1 ½ foot long, glabrous, smooth, 5 to 7 noded; upper internodes at length exserted; sheaths tight, terete, striate, lower subpersistent, often finely hairy; ligule a dense fringe of fine hairs; blades linear, long tapering to a fine point, 2½ to 4½ inches by 1 to 2½ lines, flat or involute, somewhat rigid and glaucous, finely pubescent or glabrous, smooth.

Panicle oblong or obovoid, open or contracted, lax, 2½ to 6 inches long; rhachis slender, smooth; branches filiform, smooth, 2-nate or solitary, the longest 2 to 4 inches long, very laxly and repeatedly divided from the base, or the strongest simple, for ½ to 1 inch; branchlets and pedicels very delicate, capillary, flexuous, the latter 1 to 2 lines long.

Spikelets elliptic-oblong, 1 line long, glabrous, pallid or tinged with purple.

Glumes, lower an extremely minute scale, upper oblong, almost equalling the spikelet, emarginate, membranous, faintly 5-nerved. Florets, lower male; valve very similar to the upper glume, but slightly longer and broader; pale equal to the valve, glabrous. Perfect floret oblong, ⅓ line long, valve rigidly membranous, shining, obscurely 5-nerved. Anthers ½ to ⅜ line long.


Drawn from Buchanan's 259, which is the only specimen in the Herbarium.

Fig 1, Lower valve; 2, pale; 3, upper valve; 4, pale. All enlarged.

Melinis, Beauv.

Spikelets linear-oblong, small, laterally compressed, panicled, deciduous from the capillary pedicels; lower floret reduced to an empty valve; upper perfect. Glumes very dissimilar, lower reduced to a minute scale, upper membranous, shortly 2-lobed, mucronulate from the sinus, prominently 7-nerved, glabrous, rarely hairy. Valves very dissimilar; lower rather like the upper glume, but more deeply lobed and usually with a fine awn from the sinus, 5-nerved; upper smaller, very thin and rigidly membranous, minutely 2-lobed, shining, obscurely 3-1-nerved with an equal, obscurely 2-nerved pale of similar substance. Lodicules 2, very delicate. Stamens 3. Styles free, slender; stigmas plumose, laterally exserted. Grain unknown.

Perennial or Annual (?)—Culms ascending from a prostrate, very slender, many noded, branched base; ligules reduced to a fringe of short hairs; panicle contracted, narrow, much divided, with capillary branchlets and pedicels; spikelets usually purple, at least at the tip.

Species 1, in Brazil, tropical and subtropical Africa and Madagascar. Very closely allied to Tricholana.
TRICHOLÆNA GLABRA.

PLATE 181.
MELINIS MINUTIFLORA. BEAUV.
Var: Pilosa. Stapf.
PLATE 182.


**Perennial or Annual (?)—Culms 1 to 3 feet high, more or less hirsute except at the upper nodes.**

Leaves loosely hirsute to tomentose; sheaths tight, terete, striate, finely tubercled; blades linear to linear-lanceolate, long tapering to a very fine point, 2 to 6 inches by $2\frac{1}{2}$ to $4\frac{1}{2}$ lines, rather rigid, flat or involute.

Panicle linear to linear-oblong, contracted or almost spike-like, 4 to 8 inches long, erect, stiff or rather flexuous; rhachis slender, angular, smooth below; branches 2-nate or the lower in scanty fascicles, erect, up to 3 inches long, distantly and repeatedly divided from the base; branchlets and pedicels capillary, flexuous, puberulous, the latter very unequal, up to almost 2 lines long, with or without white, stiff, fine hairs below the tips.

**Spikelets 1 line long, very minutely bearded at the base.**

Glumes, lower very minute, oblong, obtuse, nerveless, upper equalling the spikelet, linear-oblong, like the lower valve, more or less hairy above the base, hairs white, very fine; awn of the lower valve very slender, scaberulous, up to 4 lines long. Perfect floret $\frac{2}{3}$ line long, glabrous. Anthers $\frac{1}{2}$ line long.

**Habitat:** Natal. Near Ummumulo hills, 2000 to 2500 feet alt., Buchanan 299.

Also in Nyassa land and on Mount Ruwenzori.

The typical form, which is very common in Brazil, and occurs also in tropical Africa and Madagascar, only differs in being completely glabrous, and in the occasional absence of awns.

Fig 1, Upper glume; 2, lower valve; 3 upper valve; 4, pale. *All enlarged.*

**ARUNDINELLA, RADDI.**

Spikelets small, $2\frac{1}{2}$ lines to less than 1 line long, acute or acuminate, panicled, continuous with or imperfectly jointed on the pedicels; rhachilla disarticulating between the valves, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous, lower male, rarely barren or perfect, upper perfect. Glumes persistent, acuminate, membranous, strongly 3-5-nerved, upper usually longer. Lower valve thin, equalling the lower glume or slightly longer, subacute or minutely truncate, 3-7-nerved; upper valve terete, rarely dorsally subcompressed, thin, finally cartilaginous, entire or minutely bifid, 3-7-nerved, minutely scaberulous, lobes sometimes produced into fine bristles; awn terminal or from between the lobes, short, knee or straight, or 0; callous very short, obtuse. Pales linear, 2-keeled; flaps more or less auricled. Lodicules 2, cuneate, rather fleshy or 0 in the lower floret. Stamens 3 or 0 in the lower floret. Ovary glabrous, oblong or more or less arrested or 0 in the lower floret; styles distinct; stigmas plumose, laterally exerted. Grain oblong to ellipsoid, terete or dorsally subcompressed, tightly embraced by the valve and pale, free; hilum punctiform; embryo large; albumen hard.

Perennial, rarely annual; leaves various; panicles usually rather stiff; branches stiff, divided from the base.

About 25 species, mainly in tropical Asia and America.
PLATE 183.

ARUNDINELLA ECKLOII, Nees. (Fl. Cap., Vol. VII., p. 448).

Nat. Order Gramineæ.

Perennial.—Culms erect, 2½ to 4 feet long, glabrous, 4 to 6-noded; sheaths rather tight, glabrous or ciliate along the margins or hirsute; ligules extremely short, ciliate, blades linear, tapering to a long fine point, from a few inches to more than 1 foot, by 2 to 4 lines, flat or convolute, rigid, glabrous, margins rough.

Panicle linear-oblong to oblong, contracted or open, up to 1 foot long; branches solitary or 2, rarely 3-4-nate, the longest up to 3 inches long, stiff, scabrid.

Spikelets subsecund, 2 to 2½ lines long.

Glumes, lower ovate-oblong, mucronate, 1½ to 2 lines long, 3, rarely 4-5-nerved; upper ovate-lanceolate, 2 to 5 lines long, 5-nerved. Florets, lower male; valve linear-oblong, subacute, 1½ to 2 lines long, sub-7-nerved; pale linear-oblong, 1½ line long, keels winged below, scaberulous above; lodicules present; anthers ½ line long. Perfect floret; valve oblong, obscurely bifid, 1½ line long, thin, minutely scaberulous; callus minutely 2-bearded; awn fine, column dark brown, 1½ line long, bristle whitish, 1 line long; pale linear, 1½ line long, scaberulous between the keels; lodicules and stamens as in the male floret.

Habitat: Natal. On the banks of rivulets between Umzinkulu River and Umkomaas River, Drège; Riet Vlei, 4000-5000 feet alt., Buchanan 275; Umzumulo, near water, 2000 feet alt., Buchanan 274; and without precise locality, Gerrard 684, 685; summit of Drakensberg, near Nelson's Kop, March, Wood 6903, alt. 5000-6000 feet; Dundee, March, Green 82; Zululand, 2000 feet alt., Jenkinson 96.

Jenkinson says of this grass: "Good for cattle, grows in scattered tufts."

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, stamens and lodicules; 5, pale; 6 upper valve; 7, pale; 8, pistil, stamens and lodicules. All enlarged.

STENOTAPHRUM, TRIN.

Spikelets lanceolate to ovate-oblong, sessile, singly or 2-4 on the very short branches of an apparently simple second spike, more or less sunk in hollows on or adpressed to the anterior face of a dorsally flattened herbaceous, continuous or jointed rhachis. Florets, lower male, or reduced to an empty valve; upper perfect.

Glumes usually very dissimilar, lower minute, hyaline, upper almost equaling the spikelet, 5-7-nerved, rarely both more or less similar and minute, or the lower nerved like the upper, although smaller. Valves equal, lower (outer) firm, chartaceous, 3-9-nerved, upper thinner 5-nerved. Pales almost equaling the valves, 2-keeled. Lodicules 2, obliquely quadrate, nerved. Stamens 3. Styles free or almost so, very slender; stigmas long, plumose, laterally exserted. Grain broadly elliptic-oblong, slightly compressed from the back, tightly enclosed; hilum punctiform, basal; embryo about half the length of the grain.

Creeping or prostrate branched perennials with ascending culms; sheaths strongly compressed, lower more or less flabellate; blades mostly obtuse; spikes terminal and often also lateral from the upper leaves, tough or at length breaking up at the joints.

Species 5, mainly on the shores of the tropical and subtropical seas.
STENOTAPHRUM GLABRUM, TRIN.
PLATE 184.


Culms ascending, prostrate or creeping and frequently rooting at the nodes, often very long, strongly compressed, glabrous, smooth, many-noded.

Leaves glabrous or more or less hairy at the mouth of the sheath or at its junction with the blade, lower crowded at the base of the branches, more or less flabellate, followed often by a pseudo-opposite pair of and 2-4-distant leaves; sheaths strongly compressed, keeled, pallid, soon thrown aside, lower persistent; ligule a fringe of very short hairs; blades linear, obtuse, 1 to 6 inches by 1 to 3 lines, first folded, then flat or at length involute, rather firm, glaucous or light green, smooth; false spikes terminal and lateral from the upper leaves, erect, stiff or curved, 1 to 4 inches long, compressed, glabrous; rhachis linear, entire, 1 to 2½ lines broad, with or without transverse depressed lines on the back indicating the joints, often hollowed out in front; branches very short, more or less sunk in the hollows or adpressed to the margin of the rhachis, compressed or angular, often very stout.

Spikelets solitary from the inner side of the base of the branch, sunk in the adjoining hollow, or 2 to 5 crowded along the branch, lanceolate-oblong to oblong, acute, 2½ lines long, pallid.

Glumes, lower hyaline, very short, broad, truncate, nerveless, upper ovate-oblong, concave, almost as long as the spikelet, 7-nerved, firmly membranous. Florets, lower male; valve lanceolate-oblong to oblong, acute, equalling the spikelet, chartaceous, faintly 7 to 9-nerved, dorsally flattened, somewhat rough. Anthers 1½ to 1¼ line long; upper floret perfect; valve similar to the lower, but more acute, firmly membranous, 5-nerved.

Habitat: Natal. Durban Flat, Buchanan 16; without precise locality, Gerrard 678; Zululand, 2000 feet alt., January, Jenkinson 60 (Wood 9059); Umsinga, Buchanan 98. Also in Cape Colony by numerous collectors.

Drawn from Jenkinson's 60, and compared with Buchanan's 98.

Of this genus five species only are known, the one here described is not uncommon near the sea coast in tropical countries, it has been described under seven different names in addition to the correct one as given here, one of these names is S. Americanum, Schrank, and in a work on North American grasses published by the United States Department of Agriculture it is said of it: "This grass grows in sandy soil, especially near the sea coast. It has strong creeping roots, which render it capable of enduring great drought. It has been recommended in Florida as a very valuable pasture grass." The specimen from which our drawing was made was a rather imperfect one.

Mr. Jenkinson says of this grass: "A running grass, used for lawns Seeds eaten by natives in time of famine."

Fig 1. Portion of rhachis with spikelets; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, upper valve; 7, pale. All enlarged.
**Trichopteryx, Nees.**

Spikelets usually 2-18 lines long, more or less lanceolate to linear, pedicelled, panicled. Rhachilla disarticulating between (and less readily below) the valves, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous; lower male, rarely barren; upper perfect. Glumes persistent, membranous or subcoriaceous, unequal, 3 (very rarely 4-6) nerved, glabrous or bristly from black glands. Lower valve membranous, 3 (very rarely 7) nerved, with the innermost side-nerves much shorter; upper valve terete, membranous to cartilaginous, shortly bifid with the lobes sometimes produced into bristles, 5-9-nerved; awn from between the lobes, kneed, twisted below. Pales membranous, 2-keeled, narrower in the perfect floret and channelled between the stout keels. Lodicules 2, cuneate, usually very fleshy. Stamens 2, rarely 3, or 0 in the lower floret. Ovary oblong, glabrous, rudimentary in the male floret; styles distinct, glabrous, stigmas plumose, long, laterally exserted. Grain obovoid to linear-oblong, grooved or almost terete, tightly embraced by its valve and pale, free; hilum linear, long; embryo large; albumen very hard.

Perennial, rarely annual grasses of very different habit; leaves more or less rigid; ligules a line of hairs; spikelets slender, from 2 lines to 1 1/2 inch long, scattered in mostly contracted, narrow panicles.

**PLATE 185.**


Nat. Order Gramineae.

Densely tufted.—Culms 2 to 3 feet long, glabrous, 2 (rarely 3) noded.

Leaves all but 2 or 3 near the base, sheathing the culms to 1/2 foot; sheaths firm, tight, glabrous or more or less hispid, bearded at the nodes, the lowest tomentose at the base and finally splitting into rigid fibres; blades narrow-linear, tapering to a long setaceous point, 1/2 foot by 2 lines or less, flat or convolute, rigid, hisrate or glabrescent.

Panicle erect, contracted, 6 to 10 inches long; rhachis glaucescent; branches fascicled or geminate, erect, very unequal, the longest to 2-3 inches long, filiform, sparingly branched, scabrid or almost smooth.

Spikelets light brown, 5 to 6 lines long.

Glumes glabrous, rarely sparingly bristly, the lower lanceolate-oblong, minutely subtruncate, 2 1/2 to 3 lines long, the upper lanceolate, produced into a linear convolute truncate beak, 5 to 7 lines long. Florets, lower male; valve lanceolate, acute or acutely acuminate, usually shorter than the upper glume, glabrous, or with a very few bristles along the outer nerves; pale linear-oblong, 3 1/2 lines long. Stamens 2, anthers 1 1/2 to 2 lines long. Perfect floret; valve oblong-linear, terete, 2 1/2 to 3 lines long (in this and the following species measured from the calyx to the base of the awn), pubescent, faintly 7-nerved, shortly bifid; lobes acute; callus 2-toothed, villous, bearded, 1/2 line long; column of awn 4 to 5 lines long; bristles 9 to 15 lines long; pale lanceolate, acute, 3 lines long. Stamens as in the male.

Habitat: Natal. Umpumulo, Buchanan 294; var erinita, Umpumulo, Buchanan 293; Inanda, 1800 feet alt., Wood 1580; South Downs, 4000-5000 feet alt., Wood 4404; Karkloof, 4000 feet alt., Wylie (Wood 6011); Lidgetton, 4000 feet alt., Wood 9095. Also in Transvaal, Pondoland, and tropical Africa.

Fig 1, Typical plant; 2, lower glume; 3, upper glume; 4, lower valve; 5, pale; 6, upper valve; 7, pale, ovary and lodicules; 8, branchlet of var erinita. Except Fig 1, all enlarged.
PLATE 186.

TRICHOPTERYX DREGGEANA.
PLATE 186.


Nat. Order Gramineæ.

Culms ascending or erect from a slender creeping rhizome, branched below, 1 to 2 feet high, very slender, glabrous, many-noded, internodes exserted.

Leaves equally distributed over the culms; sheaths tight, glabrous; blades narrowly linear, tapering to an acute point, usually involute, somewhat subulate, reflexed, $\frac{3}{4}$ to 1 line long, glabrous, margins cartilaginous.

Panicle narrow, 1 to 3 inches long, flaccid or erect and flexuous, contracted or open; rhachis filiform; branches 2-3-nate, capillary, almost smooth, branched from below the middle, up to 1 inch long, tips of pedicels with long fine hairs.

Spikelets light brown, 2 to 3 lines long.

Glumes, lower ovate, subacute or obtuse, $1\frac{1}{2}$ to 1 line long, glabrous, thin, upper lanceolate acuminate, acute, 2 to 2$\frac{1}{2}$ lines long. Florets, lower male; valve like the upper glume, slightly longer; pale linear-oblong $1\frac{1}{2}$ line long. Stamens 2, anthers $\frac{1}{2}$ line long. Perfect floret; valve oblong 1 line long, deeply bifid, lobes produced into fine bristles $\frac{1}{2}$ line long, glabrous except a long beard on each side at the middle, sub-7-nerved; callus minute, obtuse, minutely bearded; awn very fine, 3 lines long, column very short; pale 1$\frac{1}{2}$ line long; stamens 2.

Habitat: Natal. Common on wet banks, Buchanan 291; between Umtentu and Umzimkulu Rivers, 500 feet alt., Drège; Zululand, in a swamp at Entumeni, Wood 3995.

Also in Transvaal and Shire Highlands.

In the description in the Flora Capensis the leaves are said to be $\frac{3}{4}$ to 1 line long, this is evidently a printer's error, it should be $\frac{3}{4}$ to 1$\frac{1}{4}$ line wide.

Fig 1, Lower glume; 2, lower valve; 3, pale; 4, stamens; 5, upper valve; 6, pale; 7, ovary, style, stamens and lodicules. All enlarged.

TRISTACHYA, Nees.

Spikelets 5 lines to 2 inches long, lanceolate to linear, sessile or shortly pedicelled, in clusters of 3 at the tips of the branches of a raceme or panicle; rhachilla disarticulating between the valves and less readily or imperfectly below them, glabrous, not produced beyond the upper floret. Florets 2, heteromorphous, lower male, upper perfect. Glumes persistent, membranous or subcoriaceous, more or less unequal, 3-nerved, glabrous or bristly from black glands. Lower valve membranous, 3-nerved, or 5-9-nerved with some of the nerves much shorter than the others; upper valve convolute, membranous or ultimately cartilaginous, bifid, 7 (rarely 5-) nerved, awned from between the lobes; awn knee'd, twisted below. Pales membranous, hyaline, 2-keeled. Lodicules 2, cuneate, very fleshy. Stamens 3. Ovary obovoid to oblong, glabrous or the top, hairy, rudimentary in the male floret; stigmas plumose, long, laterally exserted. Grain obovoid to linear-oblong, grooved, tightly embraced by the valve and pale, free; hilum linear, long; embryo large; albumen very hard.

Perennial, generally coarse grasses, growing mostly in compact tufts. Leaves rigid; ligule a line of hairs; triplets of spikelets large and few in racemes, or smaller and more numerous in scantily branched panicles, sometimes deciduous from the jointed peduncles.

Species 11-12, in Africa, Arabia, and Beluchistan, and in tropical America.
PLATE 187.


NAT. ORDER GRAMINEAE.

CULMS 1 to 2 feet long, glabrous, 2 (rarely 1-) noded.

LEAVES mostly basal; lowest sheaths very firm, rigid, persistent, fulvously tomentose below, glabrescent above, upper rather tight, sparsely hairy or glabrous; nodes villous; blades linear, tapering to a fine point or acute, 6 to 9 inches, by 1\(\frac{1}{2}\) to 2 lines, uppermost much shorter, rigid, glabrous and smooth, or sparsely hairy, rarely hispidly villous; triplets of spikelets 1 to 1\(\frac{1}{4}\) inch long, 5-3 in racemes, rarely 2 or solitary. Peduncles \(\frac{1}{2}\) to 1\(\frac{1}{2}\) inch long, flexuous, glabrous and smooth or hispid above; pedicels very short, stout or hardly any.

GLUMES, lower lanceolate, acute or subulate-acuminate, 9 to 12 lines long, firm, 3-nerved, with long white soft spreading hairs from closely crowded small tubercles along the nerves; upper lanceolate, long subulate-acuminate, 14 to 18 lines long, scarious, 3-nerved, minutely tubercled and spreadingly hairy along the margin. Florets, lower male; valve similar to the upper glume, but slightly longer, 7-nerved, side nerves close to the margins with a double row of bristle bearing glands on each side; pale linear-oblong, 7 to 8 lines long; keels narrowly winged below, minutely ciliolate above. Anthers 3\(\frac{1}{2}\) lines long. Perfect floret; valve lanceolate, 4\(\frac{1}{2}\) lines long, bifid to \(\frac{1}{2}\) its length, glabrous, 7-nerved, lobes lanceolate, acuminate; callus pungent, 1\(\frac{1}{2}\) line long, villous; awn yellowish, 2 to 3 inches long, obscurely geniculate; pale linear-oblong, 5 to 6 lines long, keels almost smooth. Ovary obvoid, villous except at the base; styles pubescent; grain linear-oblong, 3 to 3\(\frac{1}{2}\) lines long.

Habitat: Natal. On the summit of Table Mountain near Pietermaritzburg, Krauss 366; Inanda, Wood 1594; Umpumulo and Riet Vlei, Buchanan 237, and without precise locality, Buchanan 59; Zululand, Jenkinson 30; Dundee, W. E. Green 110, partly.

Also in Cape Colony, Transvaal and tropical Africa.

In the report of the Cape Botanist for 1864, this grass is alluded to, and is said to be known as "Roode Zaad Gras," and Mr. Ella, of Queenstown district, says of it: "Said to be a good sound pasture, standing and eatable when all others have been blown into dust, it does not stand frost, nor does it shoot early in spring, nor does it grow readily without moisture, but from its permanency when once matured it may be said to be the most important of the district."

Fig. 1, Lower glume; 2, upper glume; 3, lower valve; 4, pale; 5, stamens and lodicules; 6 upper valve; 7, pale; 8, pistil, stamens and lodicules. All enlarged.
TRISTACHYA LEUCOTHRIX. TRIN.
ANTHOXANTHUM ECKLONII.
SPIKELETS oblong to narrow-lanceolate, slightly laterally compressed; rhachilla disarticulating above the upper glume, not produced beyond the uppermost floret. Florets 3, heteromorphous, the lower two male or barren, the terminal perfect. Glumes persistent, membranous, 1 to 3-nerved, keeled, acuminate; upper longer. Lower 2 valves equal and very similar, oblong, emarginate, membranous, strongly laterally compressed, 5 to 7-nerved, keeled, hairy, awned, awn of the lower valve short from \( \frac{1}{2} \) to halfway below the tip, of the upper longer, kneed, from near the base, rarely from the middle; terminal valve much shorter than the lower two, broadly elliptic, very thin, delicately 7 to 1-nerved. Pales of the lower two florets, if present, 2-keeled, of the terminal 1-nerved. Lodicules 0. Stamens 3 in the male, 2 in the perfect florets. Styles distinct, long, stigmas long, exserted from the top of the spikelet, plumose. Grain ovoid, slightly laterally compressed; hilum punctiform; embryo \( \frac{1}{2} \) the length of the grain.

PERENNIAL or ANNUAL; blades flat, usually flaccid; panicle slender, very narrow or spike-like, sometimes reduced to scanty racemes; sweet scented. Species 15.

PLATE 188.

ANTHOXANTHUM ECKLONII, Stapf. (Fl. Cap., Vol. VII., p. 466).

Nat. Order Gramineæ.

PERENNIAL.—CULMS tufted, erect, simple, 1 to 3 feet long, smooth, glabrous or scaberulous, finely striate, about 3-noded; internodes gradually longer from the base, up to 1 foot or more long: sheaths rather tight, smooth or scabrid, rarely reversedly hispidulous, striate, usually very much shorter than the internodes except the lowest, the basal one or two bladeless, acute; ligules scarious, white, ovate, obtuse, 1 to 2 lines long; blades linear, gradually tapering, acute, up to 3 inches by 1 to 1\( \frac{1}{2} \) line, the upper very short, rather rigid, glabrous, smooth or scabrid, rarely reversedly hispidulous, prominently many nerved.

PANICLE erect, spike-like, sometimes interrupted near the base, up to 2 inches long, shiny, pallid; rhachis glabrous; pedicels with spreading hairs.

SPIKELETS oblong-lanceolate, 3\( \frac{1}{2} \) to 4 lines long, pallid.

GLUMES lanceolate to ovate-lanceolate (in profile), acuminate, scaberulous on the keels, lower 2\( \frac{1}{2} \) to 3 lines long, 1-nerved, hyaline, upper 3\( \frac{1}{2} \) to 4 lines long, 3 (very rarely 1-) nerved, subhyaline. Florets, lowest male or barren; valve about 2\( \frac{1}{2} \) lines long, 5-nerved, with a short straight awn from above the middle; intermediate floret equal and very similar to the preceding, always empty, with a kneed awn 4 lines long from below the middle; uppermost floret perfect, 1 to 1\( \frac{1}{4} \) line long; valve 5-nerved; anthers 1\( \frac{1}{4} \) to 1\( \frac{1}{2} \) line long; grain \( \frac{7}{8} \) line long.

Habitat: NATAL. Riet Vlei, 4000-5000 feet alt., Buchanan 158.

Drawn from Buchanan's 158, the only specimen in the Herbarium.

Fig 1, Lower glume; 2, upper glume; 3, lowest valve; 4, intermediate valve; 5, upper valve; 6, pale. All enlarged.
Kœleria, Pers.

Spikelets laterally compressed in spike-like panicles; rhachilla glabrous or finely hairy, disarticulating above the glumes and between the valves, produced with or without a rudimentary valve. Florets 1-5, perfect, or the uppermost more or less reduced. Glumes 2, persistent, subequal or unequal, subacute to acuminate, keeled, the lower usually 1-nerved or like the upper 3-nerved, margins hyaline. Valves exceeding the glumes, acute or obtuse with the margins and tips broadly hyaline, 3-5-nerved; side nerves usually faint, conniving above, middle nerve percurrent or excurrent into a mucro or a short subterminal awn; callus very minute, glabrous. Pales shorter than the valves or almost as long, 2-keeled, 2-toothed, conspicuously hyaline and white. Lodicules 2, hyaline. Stamens 3. Ovary glabrous; styles distinct, very short, stigmas laterally exserted, plumose. Grain oblong, laterally compressed, whitish, soft, tightly embraced by the hardened back of the valve; hilum basal, short, obscure; embryo small.

Perennial or Annual.—Blades usually very narrow; ligules hyaline. Panicle usually cylindric, often interrupted, glabrous and glistening from the hyaline white margins of the valves and pales, or more or less hairy.

Species 12 to 15, mainly in Europe, North Africa, and temperate Asia, one species almost cosmopolitan.

PLATE 189.


Nat. Order Gramineæ.

Perennial, densely cespitose.—Culms erect, rarely geniculately ascending, 6 inches to more than 1 foot long, glabrous or villous, pubescent, 1-2-noded, upper internodes very long, exserted.

Leaves crowded near the base; sheaths rather tight, striate, glabrous or pubescent to villous, the lower more or less persistent; ligule obtuse, minutely ciliolate, rarely more than ¼ line long, usually produced into lateral auricles; blades linear, acute, from 1 inch to 1 foot long, to 1 line broad, flat, soft and even flaccid, or setaceously convolute and flexuous or rigid, glabrous and smooth below, pubescent above, or ciliate, or pubescent to villous all over.

Panicle cylindric, often interrupted or lobed, 1 to 4 inches, by 2½ to 6 lines, dense; branches repeatedly and very shortly branched from the base, like the rhachis pubescent to minutely villous; pedicels very short.

Spikelets 2 to 2½ lines long, 2-3-flowered.

Glumes glabrous or pubescent, the lower narrow, lanceolate, subacute to acute, 1¼ to 1⅛ line long, 1-nerved, the upper much broader, subacute to acutely acuminate, 1½ to 2½ lines long, 3-nerved. Valves oblong to lanceolate in profile, subobtuse to acuminate, sometimes mucronulate, 1⅔ to 2 lines long, glabrous or pubescent; lodicules 2-3-lobed or toothed; anthers ½ to 1 line long; grain up to 1¼ line long.

Habitat: Natal. Buchanan 95, 157; Van Reenen, 5000-6000 feet alt., December, Wood 7215a.

Baron F. v. Mueller says of this grass: "Wide dispersed over the globe. A perennial grass of fair nutritive quality, sustains itself on dry soil." Another authority says: "Of no agricultural value, and rejected by cattle."

Fig 1, Spikelet with glumes removed; 2, lower glume; 3, upper glume; 4, valve; 5, pale; 6, stamens and lodicules. All enlarged.
KOELERIA CRISTATA. PERIS
AVENASTRUM TURGIDULUM. STAFF.
Avenastrum, Jess.

Spikelets usually erect or suberect, rarely nodding, medium-sized (4 to 7 lines long, rarely less or more), in nearly always erect, often stiff panicles; rachilla more or less long-hairy, disarticulating above the glumes and between the valves, produced into a short bristle beyond the uppermost floret or ending with a rudimentary valve. Florets 3 to 6, perfect, or the uppermost more or less reduced. Glumes 2, persistent, scarious, more or less unequal, acute or acuminate, more or less distinctly keeled, lower 1 or 3-nerved. upper 3 (very rarely 5 to sub-7) nerved. Valves usually distinctly exserted from the glumes, more or less herbaceous with scarious or hyaline tips, often rather firm, acute or acuminate, bifid, with or without bristles from the lobes, 5 to 9-nerved, awned; awn dorsal from the middle or slightly above it, kneed and twisted below; callus short or elongate, villous. Pales shorter than the valves, 2-keeled, 2-toothed or bifid. Lodicules 2, rather large, hyaline. Stamens 3. Ovary hairy from the middle upwards or at the top only; styles distinct, short; stigmas laterally exserted, plumose. Grain oblong, slightly laterally compressed, usually grooved in front, hairy at the top, pullid, rather soft, embraced by the somewhat hardened valve and the pale; hilum linear, up to half the length of the grain; embryo small.

Perennials, ecespite; blades linear, usually narrow, flat or convolute, often setaceous; ligules hyaline. Panicle narrow, erect, often stiff, rarely flaccid or expanded.

PLATE 190.

Avenastrum turgidulum, Stapf. (Fl. Cap., Vol. VII., p 474).

Nat. Order Gramineae.

Culms 1 to 2½ feet long, glabrous, 2 to 3-noded, upper 2-3 internodes more or less exserted, uppermost finally long exserted.

Leaves usually very few near the base, about 3 higher up; sheaths terete, rather tight, very minutely puberulous or glabrous; ligule truncate, up to ¼ line long; blades linear, tapering to an acute point, up to 6 inches, by 1½ line, flat or involute, subflaccid or more or less rigid, subglauces, glabrous, rarely scantily hairy, scaberulous above.

Panicle contracted, erect or slightly nodding, ½ to 1 foot, long; branches fascicled, very unequal, the longer up to 1½ inch long, scantily branched or simple, erect or a few spreading, filiform, scabrid.

Spikelets 4 to 5½ lines long, greenish, compactly 3-4-flowered; rhachilla slender, joints up to 1 line long, bearded near the tips.

Glumes lanceolate, acuminate, the lower 2½ to 3 lines, the upper 4 to 4½ lines long. Valves exserted, oblong-lanceolate, the lowest 3½ to 4 lines long, glabrous, light green, slightly purplish below the tips; obscurely granulated, tips scarious, 2-toothed, teeth produced into fine bristles 1 to ½ line long; callus bearded, very short; awn from the middle, rather fine, column 2½ to 3 lines long, bristle 5 to 6 lines long. Pales 3 lines long, keels ciliate; anthers ½ to 1 line long; ovary pubescent from the middle, top hispidulous. Grain 1¼ line long.

Habitat: Natal. Umsinga and foot of Biggarsberg, Buchanan 100; near Greytown, Buchanan 172; Riet Vlei, Buchanan 156; near Maritzburg, St. George 14 (Wood 7228).

Drawn from Buchanan’s 156.

Fig 1, Spikelet, glume removed; 2, lower glume; 3, upper glume; 4, valve; 5, pale; 6, pistil, stamina and lodicules. All enlarged.
PLATE 191.


Nat. Order Gramineæ.

CULMS 2 feet long, glabrous, 3 to 4-noded, sheathed to the base of the panicle.

LEAVES 4 to 6 near the base, 3 higher up; sheaths tight below, loose or open above, glabrous; ligule oblong, up to $\frac{3}{4}$ line long; blades very narrow, subsetaceous, convolute, the lower 5 to 7 inches long, those of the barren shoots to 1 foot long, glabrous, closely and strongly few-nerved, margins rough.

PANICLE contracted, about 6 inches long, slightly nodding and subflaccid; rhachis filiform; branches fascicled, very unequal, the longest up to 2 inches long, sparingly branched or simple, finely filiform, flexuous, erect, scaberulous to finely hispidulous.

SPIKELETS 4 to $4\frac{1}{2}$ lines long, loosely 3 to sub-4-flowered; rhachilla joints very slender, up to 1 line long, with long white hairs.

GLUMES very thin, lanceolate, acuminate, often aristulate, the lower 2 to $2\frac{1}{2}$ lines, the upper $2\frac{1}{2}$ to $3\frac{1}{2}$ lines long. Valves exserted, linear-lanceolate, the lowest 3 to 4 lines long, glabrous, pallid, rather thin, smooth, faintly nerved, tips scarious, sub-bifid, produced into short, fine bristles; callus $\frac{1}{4}$ line long, bearded; awn from above the middle, fine, pallid, column $2\frac{1}{2}$ to 2 lines long, bristle 5 lines long. -Pales 3 lines long; keels minutely ciliolate. Anthers up to $\frac{1}{2}$ line long; ovary top hispidulous.

VAR (?) NATALENSIS, Stapf.—Internodes exerted, very minutely puberulous below the nodes. Leaves up to 2 lines broad, flat or involute, subflaccid, more or less hairy above. Spikelets rather smaller than in the typical form.

Habitat: Natal. Var. natalensis, Riet Vlei, 4000 to 5000 feet alt., Buchanan 238.

Drawn from Buchanan's 238, the only specimen in the Herbarium.

Fig 1, Spikelet, glumes removed; 2, lower glume; 3, upper glume; 4, valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
AVENASTRUM CAFFRUM. *STAFF*
Var: (?) Natalensis, Stapf.
PENTASCHISTIS NATALENSIS, STAPF
PENTASCHISTIS, STAFF.

Spikelets from slightly over 1 line to 6 lines long, very rarely longer, laterally compressed, pedicelled, panicled; rachilla disarticulating above the glumes and between the valves, continued as a usually very minute bristle beyond the upper floret. Florets 2, hermaphrodite, much shorter than the glumes. Glumes equal or subequal, lanceolate in profile, acuminate, keeled, hyaline or subhyaline, 1-nerved or closely 3-nerved at the very base. Valves membranous, hairy, with the hairs seriate between the nerves, or glabrous excepting the always shortly hairy small callus, finely or obscurely 5 to 9-nerved, 2-lobed, awned-from the sinus; lobes with a fine bristle from the inner angle, to which they are usually more or less adnate or pass into sometimes very small, rarely 3 to 4-fid with all the divisions bristle-like. Pales 2-keeled, 2-toothed, more or less equalling the valves (exclusive of the lobes). Lodicules 2, small, cuneate, nerved, usually glabrous. Stamens 3. Ovary oblong, glabrous; styles distinct, very slender; stigmas plumose, laterally exserted. Grain oblong, semiterete to subterete, shallowly grooved in front; hilum obscure, linear-oblong, \( \frac{1}{4} \) to \( \frac{1}{3} \) the length of the grain; embryo about \( \frac{1}{4} \) the length of the grain.

Perennial, rarely annual. Leaves very variable. Panicle usually distinctly trichotomous with swollen and often bearded axils, open or contracted, sometimes spike-like. Spikelets more or less glistening.

Species over 40, mainly in South, a few in tropical Africa, 1 in Madagascar, and 1 in St. Paul's Island.

PLATE 192.

PENTASCHISTIS NATALENSIS, Stapf. (Fl. Cap., Vol. VII., p. 493).

Nat. Order Gramineæ.

Perennial.—Culms densely tufted or erect from short stolons, rather slender, 2 feet high, glabrous, smooth, 4 to 5-noded, sheathed all along; sheaths tight, striate, softly hairy or the upper glabrous; mouth shortly bearded; ligule a fringe of hairs; blades very long, filiform-convolute, longer up to more than 1 foot long by \( 1 \frac{1}{3} \) line wide at the base, glabrous or scantily hairy towards the base, smooth, margins scaberulous.

Panicle open, very lax, up to 6 inches by 6 inches, somewhat flaccid; branches 2-nate, smooth like the filiform axis and the subcapillary or capillary branchlets and pedicels, glabrous, except the sparingly hairy callous axis, very laxly and spreadingly di- and trichotomous from \( \frac{1}{2} \) to \( 1 \frac{1}{2} \) inch above the base, lowest over 3 inches long, ultimate divisions and pedicels rather short; lateral pedicels about \( 1 \frac{1}{2} \) line long.

Spikelets very pallid, 3 to \( 2 \frac{1}{2} \) lines long.

Glumes lanceolate in profile, finely acuminate, hyaline, glabrous, 1-nerved, keel minutely tubercled. Valves linear-oblong, body \( 1 \frac{1}{2} \) line long, finely and loosely hairy all-over, finely 7-nerved; lobes short, acute, adnate to or more or less free from the fine bristle, 2 to \( 2 \frac{1}{2} \) lines long at the inner side; awn about 6 lines long, kneed and twisted just below the middle; callus short, acute, minutely villous; pales equalling the valves, 2-toothed, tips ciliolate; anthers 1 line long; grain slightly over 1 line long.

Habitat: Natal. Riet Vlei, 5000-6000 feet, Buchanan 283; Karkloof, 4000-5000 feet, April, Wylie (Wood 6006).

Fig 1, Glume; 2, valve; 3, pale with ovary and lodicules; 4, pistil. All enlarged.
Phragmites, Trin. (Partly).

Spikelets loosely 3 to 10-flowered, awnless, in large panicles; rachilla disarticulating above the first and between the following valves, slender, glabrous, joints very short. Florets, the lowest male or abortive, the following hermaphrodite, the uppermost reduced. Glumes thin, unequal to subequal, lanceolate, acute, more or less rounded on the back, 3-nerved, or the lowest sometimes sub-5-nerved. Valves heteromorphous, the lowest linear-lanceolate, much longer than the subtending glume, otherwise of a similar structure, quite glabrous, persistent, the following valves very thin, linear, long and more or less caudate-acuminate, 3-nerved, middle nerve percurrent, side nerves fine, short, callus long, slender, with very long silky hairs. Pales linear-oblong, about half as long as the valves, 2-keeled. Lodicules 2 (or sometimes 3 in the lowest floret), obovate, 2-3-nerved, glabrous. Stamens 3, or 2 in the lowest floret. Ovary glabrous, in the lowest floret rudimentary or quite suppressed; styles distinct, rather short; stigmas laterally exserted, densely plumose. Grain loosely enclosed by the valve and pale, free, oblong, semiterete, hilum oblong, short, basal; embryo about half as long as the grain.

Perennials with a creeping rhizome, extravaginal innovation shoots, and tall sheathed annual or perennial culms. Blades flat; ligule a narrow, ciliate, membranous rim. Panicle lax, usually very large and much compound. Spikelets conspicuously silky from the long callus hairs.

Species 1 (or 2, very closely allied), almost cosmopolitan.

PLATE 193.


Nat. Order Gramineae.

Culms erect, 4 to 10 feet long, sometimes much taller or dwarfed, annual, many noded, usually sheathed all along; sheaths embracing each other, tight, terete, smooth, glabrous, the lowest with reduced blades or bladeless, firm.

Blades linear to lanceolate, tapering to a setaceous or subulate point, very variable in length and width (up to 1 1/2 foot long and 1/2 to 1 1/2 inch broad in the South African specimens), firm, more or less glaucous below, glabrous, smooth or slightly rough towards the base, margins smooth or scabrid.

Panicle oblong to ovate-oblong, erect or nodding, more or less secund, dense or rather lax, 1/2 to 1 1/2 foot long (in the South African specimens), brownish-purple or brownish-yellow, branched, fascicled or the upper solitary, the longest 1/2 to 2 1/2 foot, loosely and repeatedly branched, like the rachis angular and scabrid, ultimate branchlets more or less terete, filiform; lateral pedicels usually 1 to 2 lines long, the terminal up to 4 lines long.

Spikelets 6 to 8 lines long (in the South African specimens).

Glumes, 1/4 to 2 1/2 lines and 2 to 3 1/2 lines long respectively. Valves lower oblong-linear, like the following valves 2 to 6 1/2 lines long, callus to 3/4 line, hairs to 3 lines; anthers about 1 line long; grain 3/4 line long.

Habitat: Natal. Common through the Colony, Buchanan 273; near Durban, Cooper 3354; Inanda, Umhlanga valley, Wood 1335.

Almost cosmopolitan.

Fig 1, Lower glume; 2, upper glume; 3, lower valve; 4, upper valve; 5, pale; 6, stamens, pistil and lodicules. All enlarged.
PHRAGMITES COMMUNIS. TRIN.
POLYPOGON MONSPELIENSIS.

PLATE 194
POLYPOGON, Desf.

Spikelets 1-flowered, in dense spike-like, often lobed, panicles, disarticulating from the pedicels; rachilla disarticulating below the valve, not produced, flower hermaphrodite. Glumes 2, subequal, awned from the entire or 2-lobed tips. Valve shorter than the glumes, very thin to hyaline, glabrous, truncate, faintly or obscurely 5-nerved, the lateral nerves shortly excurrent or evanescent within the hyaline tips; awn very fine, usually deciduous, subterminal, sometimes reduced to a micro or 0. Pale 2-keeled, slightly shorter than the valve, rarely much shorter. Lodicules 2, delicate. Stamens 3. Ovary glabrous; styles distinct, very short; stigmas laterally exserted, loosely plumose. Grain oblong, subterete or slightly grooved, enclosed by the unaltered valve and pale; hilum short; embryo small.

Annual or subperennial; blades flat, uppermost sheath often tumid. Spikelets 1 to 2 lines long, often hidden by the numerous awns.

Species about 8; 4 in America, 1 in Africa, the others widely dispersed over the warm regions of both hemispheres.

PLATE 194.

POLYPOGON MONSPELIENSIS, Desf. (Fl. Cap., Vol. VII., p. 543).

Nat. Order Gramineae.

Annual, tufted.—Culms erect or geniculately ascending, ½ to 2 feet long, simple, glabrous, smooth, 3-4-noded, nodes exserted or enclosed; sheaths loose, often tumid, glabrous, smooth; ligules scarious, oblong, denticulate, ciliolate, 1½-3 lines long; blades linear, tapering to a callous point, 2-6 inches by 1-3 lines, flaccid to subrigid, flat, scabrid.

PANICLE spike-like, cylindric, sometimes lobed or interrupted below, 1-5 inches long, light green or straw-coloured; branches with numerous branchlets from the base, scaberulous; lateral pedicels extremely short, disarticulating near the base.

SPIKELETS 1 line long.

Glumes subequal, linear or oblanceolate-oblong, shortly 2-lobed or emarginate, scaberulous, ciliate or ciliolate; awn 2-3 lines long. Valve ¼ line long, minutely 2-4-macronulate, nerves very obscure, awn as long as the valve or shorter or 0. Pale 2-toothed or 2-macronulate, almost as long as the valve. Anthers ½-¼-line long. Grain oblong, ½ line long, subterete or terete, obscurely grooved.

Habitat: Natal. Cooper 3520.

Drawn from Cooper's 3520, the only specimen in the Colonial Herbarium.

Fig 1, Glume; 2, valve; 3, pale. All enlarged.
AGROSTIS NATALENSIS. STAPE.
AGROSTIS LACHNANTHA.
PLATE 196.


Nat. Order Gramineæ.

**Perennial or Annual**, glabrous.

Culms erect or geniculate-ascending, $\frac{1}{2}$ to 2 feet long, smooth or scaberulous below the nodes, 2 to 4-noded; leaf-sheaths minutely scaberulous; ligule 1 to $2\frac{1}{2}$ lines long; blades linear, tapering to an acute point, $1\frac{1}{2}$ to 8 inches by 1 to 2 lines, green or subglaucous, flat, flaccid, scaberulous on both sides.

Panicle contracted, narrow, 2 to 12 inches long, erect, branches very unequal, in distant fascicles, the longest up to 4 inches, or all very short, capillary, erect or flexuous, scabrid, branched from the base or the longer ones simple for $\frac{1}{2}$ to 1 inch; pedicels mostly as long as or shorter than the spikelets, the latter light green, $\frac{3}{4}$ to $1\frac{1}{4}$ line long, shining; rhachilla not produced.

Glumes subequal, lanceolate, acutely subacuminate, keels rather stout, scabrid; valve oblong, truncate, $\frac{2}{3}$ to 1 line long, hairy, often only along the side-nerves, rarely glabrous, 3-nerved, sometimes mucronate; callus scantily bearded; pale $\frac{1}{2}$ to $\frac{3}{4}$ line long; anthers $\frac{1}{4}$ line long; grain oblong, $\frac{1}{2}$ line long.

**Habitat**: Natal. Umpumulo, 2000 feet alt., common by streamlets, Buchanan 280; Riet Vlei, 4000 to 5000 feet alt., Buchanan 286; marshy ground near Mooi River, 4000 feet alt., Mason 51, 65, 69.

Also in Abyssinia. A very variable plant, so far as size and habit are concerned.

Fig 1, Glume; 2, valve; 3, pale. *All enlarged.*
Aristida, Linn.

Spikelets 1-flowered, narrow, panicled, rhachilla disarticulating above the glume, not produced. Glumes usually persistent, narrow, 1-3-nerved, muticus or mucronate, awnless. Valve convolute, cylindric or oblong-cylindric, 3-nerved, awned, rather rigid, tips gradually tapering or minutely bilobed, sometimes jointed at or above the middle; callus villous, shortly bearded, usually pungent; awn nearly always 3-partite from the base or above the simple base (stipitate) very rarely simple, continuous with the valve or disarticulating from it or deciduous with a portion of the valve, foot straight or twisted, bristles plumose or the lateral or all naked. Pale small oblong, 2-nerved or nerveless. Lodicles 2, finely nerved. Stamens 3. Ovary glabrous; styles distinct, short; stigmas plumose, laterally exserted. Grain slender, cylindric or oblong-cylindric, terete, sometimes grooved, tightly embraced by the valve; hilum linear, almost as long as the grain; embryo short or long.

Annual or more often perennial, tufted, usually with more or less wiry culms; blades narrow, usually convolute; ligule usually a line of very short hairs; panicle varying from spike-like to effuse.

Numerous species in the dry and warm regions of both hemispheres.

**PLATE 197.**


Nat. Order Gramineae.

Perennial, densely cespitose, glabrous.

Culms very slender, terete, erect, simple, wiry, 1 to 1 1/4 foot long, smooth, about 3-4-noded, internodes exserted; sheaths very tight throughout, smooth; ligule a minutely ciliate rim.

Blades setaceously convolute, fine, 2 to 4 inches long, firm, strongly curved, smooth below, minutely puberulous on the upper surface, margins scabrid.

Panicle linear-oblung, contracted, or somewhat open and lax, 3 to 4 inches long; rhachis filiform, smooth or subscaberulous; branches remotely 2 or 3-nate, or the upper solitary, erect or oblique, longest up to more than 2 inches long and sparsely divided from the middle, the others almost simple, subcapillary, scaberulous; branches 1 to 3 spicate; lateral pedicels very short.

Spikelets straw-coloured or tinged with purple, 4 to 5 lines long.

Glumes equal or subequal, lanceolate-linear, shortly mucronate from the minutely 2-toothed tips, 1-nerved. Valve linear-convolute, 3-1/2 lines long, produced into an often slightly exserted and more or less twisted almost solid scabrid beak, minutely scaberulous below it, violet; awns continuous with the valve, capillary, suberect, scaberulous, about 10 to 15 lines long; pale oblong, acute, slightly over 1/2 line long; lodicles about as long as the pale.


In the Flora Capensis, Natal is not credited with this species. Transvaal localities only being quoted.

Fig 1, Glume; 2, valve; 3, pale; 4, pistil, stamens and lodicles; 5, anther. All enlarged.
ARISTIDA AEOGLUMIS. HACK.
PLATE 198.

Aristida angustata, Stapf. (Fl. Cap., Vol. VII., p 556).

Nat. Order Gramineæ.

Perennial, densely cespitose, light green or glaucous.

Culms very slender, terete, erect, simple or very scantily branched, wiry, 1 to 1 1/2 foot long, about 3-noded, internodes exserted; sheaths very tight, often slightly widened at the base, the lower sometimes woolly.

Blades setaceously convolute, rather fine, up to 3/4 foot long, curved or flexuous, smooth below, densely pubescent or hispidulous and almost white above.

Panicle very narrow, often spike-like, 2 to 4 inches long; rhachis straight or flexuous; branches solitary, the longest up to 1 1/4 inch long; scantily branched; branchlets filiform; lateral pedicels very short.

Spikelets yellowish, 4 1/2 to 5 1/2 lines long.

Glumes unequal, oblong-linear, usually shortly mucronate, the lower 2 to 3 1/2 lines long, acute, the upper about 4 lines long, acute or minutely truncate. Valve linear, convolute, produced into a short or usually very short beak (when of sufficient length to be slightly exserted then more or less twisted), scaberulous below the beak; callus 4/5 line long; awns continuous with the valve, divericate, 5 to 7 lines long, fine; pale hyaline, 2/3 line long; lodicules 5-nerved, 1/6 line long; anthers 1 1/2 to 2 lines long, not apiculate.


In the dried state at least the nodes of this plant are very dark in colour, and contrast very strongly with the pale yellow culms.

The only South African habitats given in the Flora Capensis for this plant are Cape Colony and Transvaal.

Fig 1, Spikelet; 2, lower glume; 3, upper glume; 4, valve; 5, pale; 6, pistil, stamens and lodicules. All enlarged.
PLATE 199.


Nat. Order Gramineæ.

Perennial, loosely cespitose, sometimes stoloniferous. Rhizome slender, oblique or creeping, covered like the innovation-buds with imbricate, short ovate acute or pungent scales.

Culms fascicled, erect, 1 to 1½ foot long, slender, usually branched, glabrous, compressed below, wiry, 3 to 4-noded, internodes exserted, culm-nodes slightly swollen and sometimes protruding above the obscure sheath-nodes; sheaths tight, the lower keeled, often slipping from the stem and rolling in, glabrous or villous.

Blades very narrow, gradually passing into the sheaths, subsetaceous, acute, up to 1 foot long, rigid, convolute or folded below, curved or flexuous, smooth below, minutely scaberulous above.

Panicle narrow, 2 to 6 inches long, erect or nodding; rhachis angular; branches fascicled, erect, flexuous or nodding, the lowest ½ to 2 inches long, often undivided for 1 inch or more, filiform to capillary, scaberulous; lateral pedicels short or almost 0.

Spikelets light green to yellowish, 2-3 near the tips of the branchlets, 3½ to 4½ lines long.

Glumes unequal, thin, acute or subacute, 1-nerved, nerve excurrent into a fine bristle, 1 to 1½ line long, the lower lanceolate, 2 to 2½ lines long, the upper sublinear. Valve linear, convolute, produced into a short slightly twisted beak, as long as the upper glume, smooth or scaberulous below the beak; callus obtuse; awns continuous with the valve, very fine, 7 to 15 lines long; pale ¾ line long; lodicules delicate, lanceolate, over ½ line long; anthers 1 line long, not apiculate.

Habitat: Natal. Coast line to 1000 feet alt., Sutherland; Kathlamba Mountains, Sutherland; Weston, Mooi River, Rehmann 7342; near Durban, Williamson 34; Plant 61; and without precise locality, Buchanan 1289; in the Lubeck Herbarium, Drège 4349; Karkloof, 3000-4000 feet alt., Wylie (Wood 6015); Clairmont, near Durban, Wood 6052.

Also in the Orange River Colony.

Fig 1, Lower glume; 2, upper glume; 3, valve; 4, pale; 5, pistil, stamens and lodicules. All enlarged.
PLATE 200.


Nat. Order Gramineæ.

Culms rather stout, over 3 feet long with a fugacious snow-white adpressed woolly indumentum below the nodes; sheaths long, tight, glabrous except for some wool near the mouth, striate, ligule a flake of fine wool; blades linear, acute, involute or setaceousely convolute above, over 1 foot long, 2 lines broad near the base, smooth below, asperulous above.

Panicle contracted, dense, 1 to 1 \( \frac{1}{2} \) foot by 1 to 1 \( \frac{1}{2} \) inch, erect; rhachis rather stout, smooth; branches fascicled, the lowest up to \( \frac{1}{2} \) foot long, erect, remotely and repeatedly branched; branchlets filiform to capillary, scaberulous; lateral pedicels short.

Spikelets 2-3 at the tips of the branchlets, yellowish, 5 to 6 lines long, very slender.

Glumes very unequal, rather thin, minutely truncate or 2-toothed (when expanded), the lower lanceolate-oblung, acute, 2 to 3 lines long, the upper linear-oblung, 5 to 6 lines long; valve linear, 4 to 5 lines long, obscurely beaked, beak straight; callus very short; awns continuous with the valve, fine, scaberulous, 7 to 8 lines long; pale \( \frac{1}{3} \) line long; lodicules few-nerved, \( \frac{1}{4} \) line long; anthers 3 lines long, cells minutely apiculate.


Fig 1, Lower glume; 2, upper glume; 3, valve; 4, pale; 5, pistil, stamens and lodicules. All enlarged.
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