

# The genus *Melica* L. (Poaceae) in southern Africa

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## ABSTRACT

Two species are recognized in this revision of the genus *Melica*. Both species belong to the subgenus *Melica*, and are the only representatives of the genus in Africa south of the Sahara. Five species formerly recognized have been reduced to synonymy.

## INTRODUCTION

In *Species Plantarum* (1753), Linnaeus described three species in *Melica*, all from the northern hemisphere. The first southern African species were described by Thunberg in the *Prodromus* of 1794, where he assigned six species to the genus, but in *Flora Capensis* of 1823 he correctly moved four of these to *Ehrharta*, leaving the two *Melica* species presently recognized. Additional species were described over the years by Schrader (1821), Lehmann (1821), Nees (1841) and Stapf (1900 and 1910), so that by the time of *Flora Capensis*, Stapf (1900) recognized six species. Following Stapf, Chippindall (1955) accounted for seven species, but gave a key to only the two Thunberg species, and implied doubt about the status of the other five, which are here reduced to synonymy.

*Melica* was not typified by its author (Linnaeus, 1754), and two proposals have been made for a lectotype. Nash in Britton & Brown (1913) put forward *M. ciliata* as the lectotype. Hitchcock & Green (1929) suggested instead that the Standard-species should be *M. nutans*, on the grounds that Linnaeus first used the generic name *Melica* in *Flora Lapponica* in 1737, and the species there was *M. nutans*. The Nash proposal can be superseded by the Hitchcock & Green proposal on the grounds that all the lectotypes set out in Britton & Brown (1913) were selected arbitrarily (Stafleu, 1978). The *Index Nominum Genericorum* accepts *M. nutans* as the lectotype species for the genus.

*Melica* is a classical name that was adopted by Linnaeus for this genus. Theophrastus applied it to an unknown species of *Sorghum*, and in Italy the name today is used for a kind of *Sorghum* with sweet juice (mel = honey).

Hempel (1970 and 1973) has divided *Melica* into subgenera and sections. Our two species both occur in subgenus *Melica*, *M. racemosa* in the section *Melica* and *M. decumbens* in the section *Beckeria* (Bernh.) Aschers. emend. Hempel. It is interesting to note that each of the three Linnaean species is the type of a different subgenus or section as recognized by Hempel. *M. nutans* is the type of subgenus *Melica* and section *Melica*, *M. ciliata* is the type of subgenus *Melica* and section *Beckeria*, and *M. altissima* is the type of subgenus *Altimelica*. *Melica* is thus one of the few Linnaean grass genera that has remained undivided to the present day.

## POSITION OF *MELICA* IN THE POACEAE

There has been little controversy about the subfamily and tribal affinities of *Melica*. The genus has appeared for the past century in relatively the same position in most treatments, although the classification of the Poaceae has been changed drastically during that time. Bentham in *Genera Plantarum* (1883) classified *Melica* in series B Poaceae, tribus XI Festuceae, subtribus 6 Meliceae, along with the other genera *Heterachne*, *Anthochloa*, and *Diarrhena*. Modern systems, with more subfamilies, recognize the same affinities for *Melica*. Gould (1968), writing for North America, classified *Melica* in subfamily I Festucoideae, tribe 4 Meliceae, and included the genera *Glyceria*, *Catabrosia*, *Pleuropogon* and *Schizachne*. Tzvelev (1968) has classified the grasses of the USSR, with *Melica* in subfamily 2 Pooideae, tribe 15 Meliceae, with the genera *Schizachne* and *Pleuropogon*. For Africa, Clayton (1970) in the *Flora of Tropical East Africa* placed tribe XII Meliceae, in the Pooideae subfamily, with only one genus from tropical Africa, *Streblochaete*. In an unpublished list of world grass genera (Clayton, 1980), he included six genera in the tribe, *Streblochaete*, *Lyclochloa*, *Schizachne*, *Triniochloa*, *Anthochloa* and *Melica*, but placed *Diarrhena*, *Glyceria* and *Pleuropogon* in separate tribes. The only modern system in which Meliceae has been placed outside the Pooideae or Festuceae is that of Tateoka (1957), where it is included in the subfamily Arundoideae. However, he later moved the tribe, consisting of the genera *Glyceria*, *Pleuropogon*, *Schizachne*, *Streblochaete* and *Lyclochloa*, to the Festucoideae (Tateoka, 1965).

## DISTRIBUTION

A genus of about 70 species, *Melica* is widespread in temperate areas except Australia. The northern hemisphere distribution encircles the earth, north of the tropic of Cancer. The southern hemisphere distribution is disjunct from the northern hemisphere, with one area in South America and another in southern Africa. The southern African species are geographically the most isolated. The nearest species on the continent are in northern Algeria and Morocco, and the nearest in the southern hemisphere are in South America. (Hempel, 1970).

## MORPHOLOGY

Both southern African species of *Melica* grow in compact many-stemmed clumps, with short thin rhizomes, which are buried as much as 150 mm. The culms may branch below the soil surface, so that in a large plant there is a tough net-like mass of rhizomes

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and culm bases. The leaf sheaths and blades are scabrous with fine retrorse hairs. In *M. decumbens* the leaf blades are always strongly scabrous. *M. racemosa* most often has scabrous leaf blades also, but sometimes the leaves may be glabrous or velvety, or with scattered hairs on the upper surface. This condition is so characteristic of *Melica* that the genus may be recognized in the field by the texture of the leaves even when the plants are not flowering. In the past taxa have often been confused because of differences in the appearance of the leaf blades on herbarium specimens. In nature, the plants usually have their leaf blades expanded with the lamina held flat or slightly curved upward at the margins and the base rounded. However, as soon as the plants are damaged the blades quickly roll up so that they appear nearly filiform, and the rounded base is not obvious. For this reason, specimens of the same taxon may appear quite different on a herbarium sheet, depending on how quickly they were pressed after collection.

The inflorescence is a narrow, raceme-like panicle which overtops the leaves. The abundant lemma hairs glisten in the sun and the shining inflorescences make the plants conspicuous when in flower. The spikelets of both species are similar in structure and appearance, differing mainly in size and in location of the hairs on the lemmas. They are awnless, somewhat laterally compressed and normally bear two fertile florets, the lower larger than the upper. At the end of the rhachilla is a knob-like body composed of two or three small empty lemmas which are closely rolled into each other. This clavate structure is an important character for distinguishing the genus. The glumes are boat-shaped, glabrous, and papery in texture, with raised nerves. They are about the same length as the spikelet, being sometimes slightly shorter and sometimes slightly longer. The lemmas are firmer than the paleas, with more nerves, and provide the main distinguishing character between the southern African species. In *M. racemosa* the hairs arise only from the lateral nerves, leaving the back of the lemma glabrous, whereas in *M. decumbens* there are hairs on and between the nerves over the entire lemma. The paleas are sharply folded back along the two nerves, so that the margin of the palea outside the nerve is pressed against the back of the palea, and clasps the immature anthers and stigmas.

The lower floret is always hermaphrodite, but the upper one may rarely be staminate, especially under adverse growing conditions. *Melica* is protandrous, and the anthers are usually shed, leaving the filaments behind, before the stigmas are exerted. The lodicules are short, thick and rounded. When the fruit is mature the florets dis-articulate at the base, and the portion of the rhacilla that bore the floret above remains pressed against the palea. The glumes are deciduous with the florets, an unusual condition in a festucoid grass. The entire spikelet may act in wind dispersal of the seed, with the lemma hairs catching the air currents as a sail.

#### LEAF BLADE ANATOMY

The Pooideae can be briefly diagnosed, on the

basis of leaf anatomy, as follows: micro-hairs absent; silica bodies horizontally elongated square to oblong, usually with crenate or sinuous outlines; stomatal subsidiary cells parallel-sided; intercostal long cell walls often straight and not sinuous; papillae very rare; double bundle sheaths around first order vascular bundles; chlorenchyma cells not radiately arranged around the vascular bundles; bulliform cells not associated with colourless cells to form deeply penetrating fans; all vascular bundles accompanied by sclerenchyma; lateral cell count greater than four (Hattersley & Watson, 1975); non-Kranz leaf anatomy and  $C_3$  photosynthesis.

The leaf anatomy of *Melica* is typical of this pooid (festucoid) type and *M. racemosa* and *M. decumbens* (Figs 1 & 2) conform exceptionally closely to the anatomical diagnosis for this subfamily. The epidermal and leaf blade anatomical attributes used in the above diagnosis of the festucoid leaf type are all present in combination in both the South African species of *Melica* except that both species lack abaxial stomata (Fig. 2a & c) and so stomatal subsidiary cell shape cannot be recorded. The intercostal long cells have minutely sinuous periclinial walls (Fig. 2b & d).

Slightly sinuous long cell walls are known from other festucoid grasses, such as *Mibora minima* L.) Desv. (Clifford & Watson, 1977), and, consequently, little emphasis is attached to this minor difference from the festucoid norm. Intercostal long cell shape and arrangement is nevertheless characteristically festucoid. Transverse sections of *Melica* leaves (Fig. 4c & e) clearly illustrate stomata in the adaxial epidermis. These transverse sections of stoma show that the stomatal apparatus is overlapped by interstomatal cells. From this observation it can be inferred that *Melica* has typical, parallel-sided festucoid stomata because only this type is overlapped by the adjoining interstomatals (Watson & Johnston, 1978). In addition, *M. ciliata* L. and *M. uniflora* Retz, both described by Metcalfe (1960), lack abaxial stomata but *M. altissima* L. has parallel-sided abaxial subsidiary cells. For these reasons neither of these slight structural deviations is considered significant and, therefore, the anatomy of *M. decumbens* and *M. racemosa* is considered to be typically festucoid.

*Melica* is non-Kranz. This has been confirmed by the carbon isotope ratios of *M. altissima* (-28%) (Troughton *et al.*, 1974) and *M. mutica* Walt. (-26,0%) (Smith & Brown, 1973). These  $S^{13}C$  values are typical of plants possessing the  $C_3$  photosynthetic pathway and it can consequently be concluded that *M. decumbens* and *M. racemosa* are  $C_3$  plants as are all members of the Pooideae (= Festucoideae) (Waller & Lewis, 1979).

Leaf anatomy, therefore, corroborates the classification of *Melica* in the Pooideae and there appears little doubt that the genus belongs in this subfamily. The leaf anatomy is so typically festucoid that, on the anatomical evidence from *M. racemosa* and *M. decumbens*, there appears little need for the recognition of the tribe Meliceae. On anatomical grounds the southern African *Melica* species could

quite satisfactorily be placed near genera such as *Festuca* or *Helictotrichon*. However, lodicule and chromosomal differences appear to justify maintaining a separate tribe for *Melica* and its allies (Decker, 1964) and suggest that the Meliceae is phylogenetically fairly distant from the Festuceae and Aveneae (Tateoka, 1965). The abundant papillae mentioned by Decker (1964) as often being present on grasses of the Meliceae were observed on neither of the *Melica* species studied, nor on *Streblochaete longiarista* Pilg., another member of the Meliceae. Papillae are also not mentioned in descriptions of *Melica* anatomy of Metcalfe (1960). Chains of costal globose papillae, as well as abundant, oblique, adaxial intercostal papillae appear to be characteristic of other genera of the Meliceae such as *Glyceria* and *Pleuropogon* (Metcalfe, 1960), but they are absent in *Melica*. Papillae are very rare in the Pooideae (Clifford & Watson, 1977) which indicates that some of the genera of the Meliceae are phylogenetically distant from *Festuca* and its allies.

The only other South African grass placed in the Meliceae is *Streblochaete longiarista* (Tateoka, 1965). There is nothing in the leaf anatomy to suggest that this grouping is artificial. The leaf of *S. longiarista* has a well-developed midrib and keel and the leaf is thinner and wider than the leaves of *M.*

*racemosa* and *M. decumbens*. In all other respects, including the absence of abaxial stomata, the leaf structure is very similar to that of *Melica* species. The thinner leaf is undoubtedly an adaptation to the shady forest habitat that *S. longiarista* favours (Chippindall, 1955). It is of interest to record that the transverse leaf sections of *M. uniflora*, as illustrated by Lewton-Brain (1904) and Burr & Turner (1933), are practically identical to those of *Streblochaete*. Furthermore, *M. uniflora* is a species of shady places (Lewton-Brain, 1904) and, like *S. longiarista*, has thin leaves with poorly developed adaxial ribs, widely spaced vascular bundles with very little associated sclerenchyme and a distinct midrib. In all these respects *M. uniflora* is more similar to *S. longiarista* than to *M. racemosa* and *M. decumbens*.

Anatomically *M. racemosa* and *M. decumbens* are very similar in all respects. The leaves of *M. racemosa* tend to be slightly thinner than those of *M. decumbens* (Fig. 1b & e). This is not a consistent difference, however, and merely appears to reflect a trend. It is the only anatomical difference detected between the two species and indicates their close relationship — an observation which agrees with the morphological evidence.

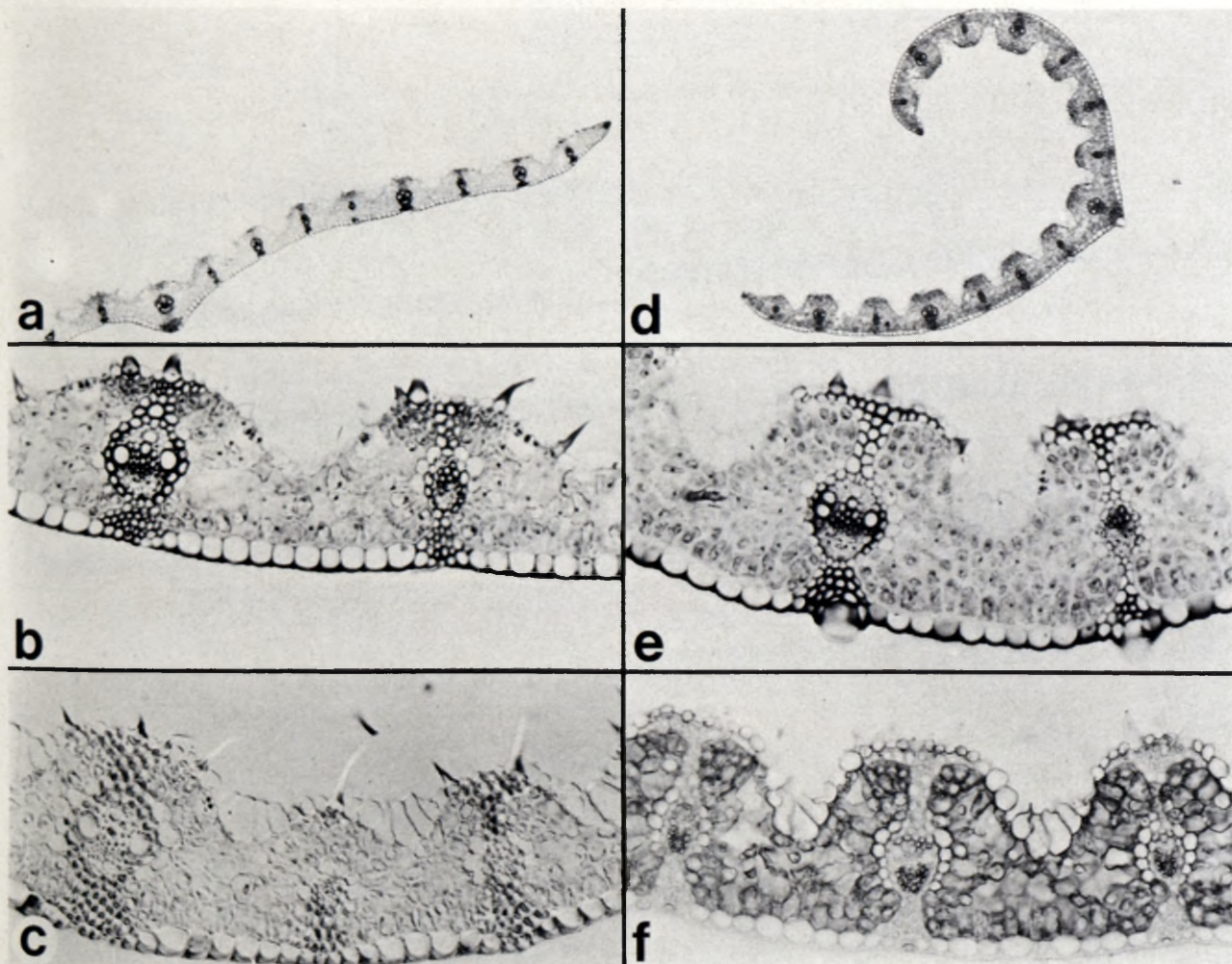


FIG. 1.—Leaf transverse sections of *Melica racemosa* and *M. decumbens*. a–c, *M. racemosa*; a & b, Ellis 1246; a,  $\times 100$ ; b,  $\times 400$ ; c, Ellis 593,  $\times 400$ , interference contrast optics; d–f, *M. decumbens*; d, Ellis 2095,  $\times 100$ ; e, Ellis 1814,  $\times 400$ ; f, Ellis 2095,  $\times 400$ .

## Specimens examined:

*Melica racemosa*

TRANSVAAL.—2528 (Pretoria): Poison garden, National Botanical Garden (—CA), *Ellis 1246, 1815*.

CAPE.—3320 (Montagu): Barrydale (—DC), *Ellis 1204, 3325* (Port Elizabeth): Summerstrand (—DC), *Ellis 605, 3326* (Grahamstown): Grahamstown Nature Res. (—BC), *Ellis 593*.

*Melica decumbens*

TRANSVAAL.—2528 (Pretoria): Poison garden, National Botanical Garden (—CA), *Ellis 1245, 1814*.

O.F.S. — 2926 (Bloemfontein): Naval Hill (—AA), *Van Heerden 86, 3025* (Colesberg): 70 km N. of Colesberg (—CA), *Smook 3190, 3026* (Aliwal North): Rouxville (—BD), *Ellis 2095*.

## MELICA

*Melica* L., Sp. Pl. 66 (1753); Thunb., Prodr. 1: 21 (1794); Fl. Cap. edn. 2: 111 (1823); Nees, Fl. Afr. Austr. 417 (1841); Benth. in J. Linn. Soc., Bot. 19: 119 (1882); Hack. in Natürl. Pfl. Fam. 2,2: 70 (1887), True Grasses 157 (1896); Stapf in F.C. 7: 684

(1900); Bews, Grasses & Grasslds S. Afr. 76 (1918); Chippind. in Meredith, Grasses & Past. S. Afr. 73 (1955); Gordon-Gray in Ross, Fl. Natal 96 (1972); Loxton in R. A. Dyer, Gen. 2: 866 (1976). Type species: *M. nutans* L.

Caespitose perennials with short, woody, deeply buried rhizomes and numerous simple or rarely branched culms. *Leaves* with sheaths overlapping; ligule a delicate hyaline membrane; blades expanded or rolled, usually slightly auriculate at base. *Inflorescence* an erect terminal raceme or narrow raceme-like panicle, often one-sided. *Spikelets* barely compressed laterally, borne on short pedicels with thickened tips, often nodding; glumes equal or unequal, narrowly to broadly ovate,  $\pm$  equalling the florets, 3–7 nerved, papery, glabrous, white or tinged with purple. *Florets* 3–6, the basal 2 (rarely 1 or 3) bisexual, the upper 2–3 sterile, reduced to empty lemmas tightly compacted into an oval body borne at end of rhachilla; lemmas of bisexual florets slightly firmer than glumes, 7–9-nerved, with long shining silvery hairs; paleas of bisexual florets obovate, ciliate on nerves.

## KEY TO THE SPECIES

- Lemmas of bisexual florets hairy only on the margins, glabrous or slightly scabrous on the back; lemmas of sterile florets glabrous or with a few hairs; spikelets 5–9 (–11) mm long..... 1. *M. racemosa*  
 Lemmas of bisexual florets hairy on the back and margins; lemmas of sterile florets usually hairy; spikelets 10–15 mm long..... 2. *M. decumbens*

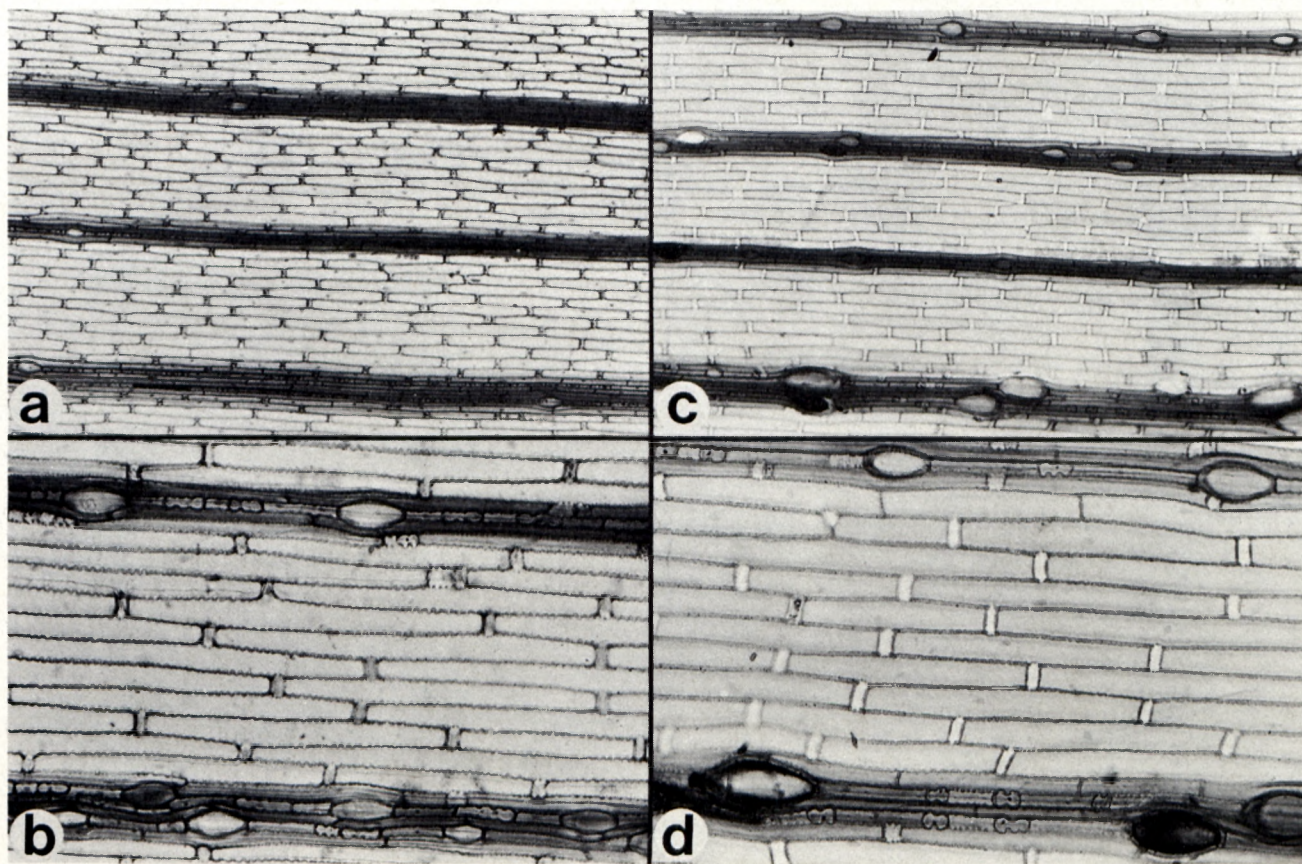


FIG. 2.—Abaxial epidermal preparations of *Melica racemosa* and *M. decumbens*. a & b, *M. racemosa*; a, *Ellis 605*,  $\times 160$ ; b, *Ellis 1815*,  $\times 400$ ; c & d, *M. decumbens*, *Ellis 2095*; c,  $\times 160$ ; d,  $\times 400$ .



FIG. 3.—*Melica racemosa*. 1, habit,  $\times \frac{1}{2}$ ; 2, ligule,  $\times 3$ ; drawn from Loxton 227 (PRE).

1. *Melica racemosa* Thunb., Prodr. 1: 21 (1794); Stapf in Fl. Cap. 7: 687 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 74 (1955); Gordon-Gray in Ross, Fl. Natal 96 (1972). Type: Cape, Thunberg s.n., Herb. no. 2173 (UPS, holo.; microfiche in PRE!).

*M. decumbens* Thunb. var. *racemosa* (Thunb.) Kuntze, Rev. Gen. 3: 356 (1898).

*M. caffrorum* Schrad. in Goett. Anz. Ges. Wiss. 3: 2072 (1821). Type: Hesse in Herb. Schrad. (LE, holo!, GOET, iso!; photocopies in PRE!).

*M. caffrorum* Schrad. var. *elatio*r Nees, Fl. Afr. Austr. 418 (1841). Type: Cape, Ecklon 803 (holo., apparently lost). Cape, in collibus ad Grahamstown, alt. 1 000–2 000 ft. (Albany), Drège s.n. (K. lecto; photo. in PRE!).

*M. ovalis* Nees, Fl. Afr. Austr. 417 (1841); Stapf in F.C. 7: 686 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 75 (1955). Type: Cape, Queenstown, Stormberg Range, 5 000–6 000 ft., Drège s.n. (K, iso.; photo, and fragment in PRE!).

*M. bolusii* Stapf in Fl. Cap. 7: 686 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 74 (1955). Type: Cape, Graaff-Reinet, in sylvestris in monte Compassberg, 8 300–8 500 ft., Bolus 1985 (K, holo.; photo in PRE!).

*M. pumila* Stapf in Fl. Cap. 7: 686 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 75 (1955). Type: Cape, Prince Albert, near Weltevrede, Drège s.n. (K, holo.; photo in PRE!).

*M. brevifolia* Stapf in Kew Bull. 1910: 131 (1910); Chippind. in Meredith, Grasses & Past. S. Afr. 75 (1955). Type: Cape, Great Winterberg, mountainside, 7 400 ft., Galpin 5614 (K, holo.; photo in PRE!).

*M. decumbens* sensu Gordon-Gray in Ross, Fl. Natal 96 (1972), non Thunb.

A tufted perennial with simple or rarely branched culms 300–500 mm high. *Leaf sheath* usually scabrous; ligule a truncate membrane 1–2 mm long; blade erect, expanded or rolled, often scabrous, but sometimes smooth with scattered long hairs or velvety on upper surface, 40–300 mm long and 1.5–5 mm across. *Spikelets* 5–9 (–11) mm long, whitish. *Florets*: bisexual florets 2 or 1, lemmas with

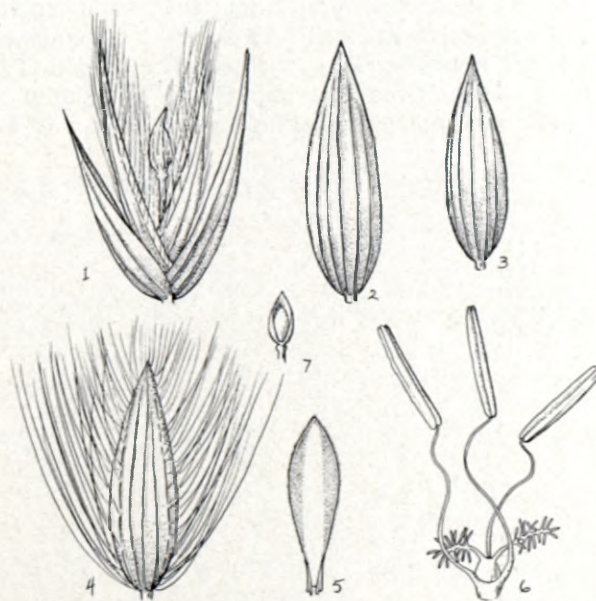


FIG. 4.—*Melica racemosa*. 1, spikelet,  $\times 5$ ; 2, upper glume,  $\times 5$ ; 3, lower glume,  $\times 5$ ; 4, lemma of lower floret,  $\times 5$ ; 5, palea of lower floret,  $\times 5$ ; 6, androecium and gynoecium,  $\times 7$ ; 7, sterile lemmas,  $\times 5$ ; drawn from Loxton 227 (PRE).

long white hairs around the margins, glabrous on back; sterile lemmas glabrous or with a few sparse hairs. Figs 3 & 4.

*M. racemosa* occurs from the south-western Cape to Natal, Lesotho and the southern and eastern Orange Free State, and is rare in the eastern Transvaal (Fig. 5). It often grows among rocks on steep hill and mountain slopes and also in savanna and fynbos, at the edges of bushclumps and in grassland, and rarely between seaside dunes and in forest clearings.

TRANSVAAL.—2531 (Komatipoort): Barberton (-CC), *Thorncroft 21*.

O.F.S. — 2727 (Kroonstad): Kroonstad, near Vals River (-CA), *Pont 570*. 2828 (Bethlehem): Near top of Sentinel at Mont-aux-Sources (-DB), *Smook 1220*. 2925 (Jagersfontein): Samara, Fauresmith (-CB), *Brueckner 960*.

NATAL.—2831 (Nkandla): Shongweni Dam, Camperdown (-AA), *Morris 905*. 2832 (Mtubatuba): Hlabisa, Hluhluwe Game Reserve (-AA), *Guy 40*; *Ward 2805*. 2929 (Underberg): Sani Pass (-CB), *Du Toit 2317*. 3030 (Port Shepstone): Isipingo Flats, former floodplain of Umlazi River (-BB), *Ward 5866*.

LESOTHO.—2928 (Marakabei): Semongkong, rocky slope (-CC), *Schmitz 4093*. 2929 (Underberg): Sehlabathebe National Park (-CC), *Beverly 794*.

CAPE.—3026 (Aliwal North): Tussen-die-Rivieren Nature Reserve (-AC), *Edwards 4179*. 3927 (Lady Grey): Barkly East (-DC), *Greyvenstein 10*. 3119 (Calvinia): Van Rhy'n's Pass, upper slopes (-AC), *De Winter & Verdoorn 9022*. 3224 (Graaff-Reinet): 10 km west of Graaff-Reinet (-BC), *Gibbs Russell, Robinson & Herman 291*. 3226 (Fort Beaufort): Gaika's Kop, Amatola Mts (-DB), *Gibbs Russell 3519*. 3228 (*Butterworth*): *Kentani* (-AD), *Pegler 1392*. 3318 (Cape Town): Camps Bay (-CD), *Wolley Dod 3106*. 3320 (Montagu): Streambed, Bantams Karoo, Laingsburg (-BB), *Compton 12160*. 3325 (Port Elizabeth): Groendal Wilderness Res. (-CA), *Scharf 1973*; Coastal dunes, Humewood, Port Elizabeth (-DC), *Dahlstrand 155*. 3421 (Riversdale): Riversdale Nat. Res. (-AB), *Taylor 7830*. 3422 (Mossel Bay): Sedgfield, coastal vegetation (-BB), *Morze 2260*.

*M. racemosa* is a very variable species that includes entities described as separate species in the past. Characters used to separate these taxa such as culm length, leaf length, degree of expansion and vesture, spikelet length, glume shape and length, and number of bisexual florets vary independently and are not generally correlated. The reduction of bisexual florets to one appears to be related to hostile environments such as high altitudes and sea

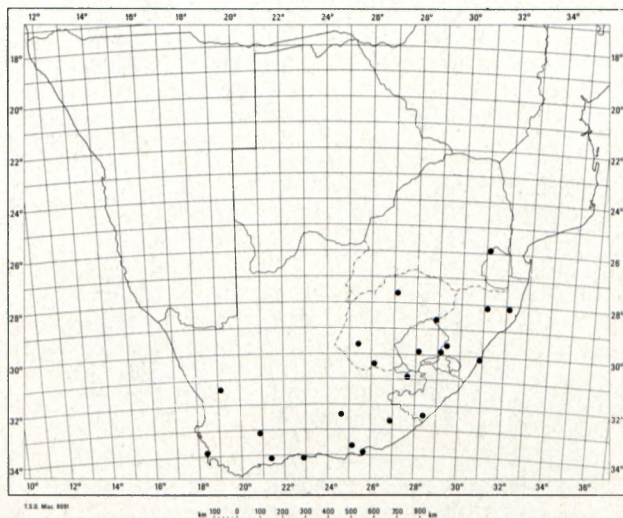


FIG. 5.—Distribution of *Melica racemosa*.

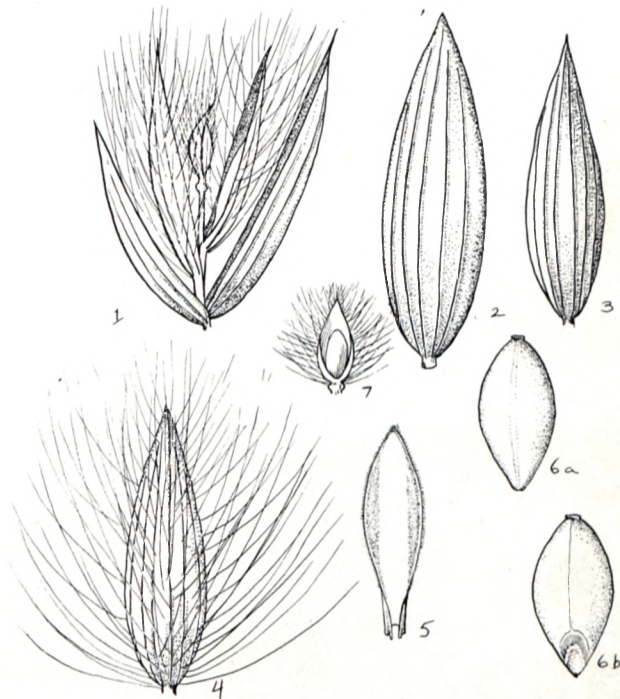


FIG. 6.—*Melica decumbens*. 1, spikelet,  $\times 2$ ; 2, upper glume,  $\times 2$ ; 3, lower glume,  $\times 2$ ; 4 lemma of lower floret,  $\times 5$ ; 5, palea of lower floret,  $\times 2$ ; 6a, caryopsis, abaxial,  $\times 10$ ; 6b, caryopsis, adaxial,  $\times 10$ ; 7, sterile lemmas,  $\times 2$ ; drawn from *Gill 40* (PRE).

dunes. Specimens from Natal tend to have spikelets 9–11 mm long, overlapping into the size range of *M. decumbens*, and were included in that species by Gordon-Gray in *Flora of Natal* (1972), as exemplified by *Ward 2805*. They are assigned here to *M. racemosa* because of the glabrous backs to the lemmas. Large size differences in the spikelets and general variability of the material suggests that chromosome races, may be present and a cytogenetics study could prove useful.

2. *Melica decumbens* Thunb., Prodr. 1: 21 (1794); Stapf in *Fl. Cap* 7: 687 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 75 (1955); Gordon-Gray in Ross, *Fl. Natal* 96 (1972). Type: Cape, *Thunberg*, s.n., Herb. no. 2166 (UPS, holo.; microfiche in PRE!).

*M. caffrorum* Schrad. var. *decumbens* (Thunb.) Nees, *Fl. Afr. Aust.* 418 (1841).

*M. dendroides* Lehm., *Pugill. Pl.* 2: 39 (1828). Type: Cape, *Lehmann* s.n. (S, lecto.; photo. in PRE).

*M. neesii* Stapf in *Fl. Cap* 7: 687 (1900); Chippind. in Meredith, Grasses & Past. S. Afr. 75 (1955). Type: Cape, Prince Albert, near Weltevrede, *Drège 752* in Herb. Lüb. (K. holo.; photo in PRE!).

A tufted perennial with simple culms 300–500 mm high. *Leaf sheaths* scabrous; ligule a truncate membrane 1–2 mm long; blade erect, usually rolled, strongly scabrous, 20–200  $\times$  1.5–3.5 mm. *Inflorescence* a narrow 1-sided panicle of 1–5 racemes to 120 mm long. *Spikelets* 10–15 mm long, glumes frequently purple-tinged. *Florets*: bisexual florets 2; lemmas with long white hairs on the entire back, often tuberculate between veins; sterile lemmas hairy. Fig. 6.

The distribution of *M. decumbens* is centered in the eastern Cape and Orange Free State extending into the northern Cape and Lesotho (Fig. 7). It is known from the south-western Cape only by the type specimen. It grows on hillsides, koppies and mountainsides, often among rocks or in the shade of trees, and occasionally on roadsides and along railway lines.

O.F.S.—2727 (Kroonstad): 4 miles SSE of Kroonstad (—CA), *Scheepers 1540*. 2826 (Brandfort): Krugersdriftdamnatuurreseervaat (—CC), *Muller 1544*. 2827 (Senekal): Willem Pretorius Game Reserve (—AC), *Van Zinderen Bakker 1158*. 3025 (Colesberg): Along roadside between Philippolis and Springfontein (—BC), *De Winter 8692*. 3027 (Lady Grey): Zastron, Aasvoëlberg, (—AC) *Smook & Gibbs Russell 2288*.

LESOTHO.—2927 (Maseru): Mamathes, on slopes above cannibal's cave (—BB), *Jacot Guillarmod 856*. 3027 (Lady Grey): 10 km from Quthing (—BC), *Du Toit 2694A*.

CAPE.—2823 (Griekwastad): Campbell, erf near village (—DC), *Wilman 1415*. 2824 (Kimberley): Koopmansfontein, Agricultural Research Station. (—AA), *Nurse 68*. 3024 (De Aar): Rolfonteinatuurreseervaat (—BB), *Jooste 143*. 3025 (Colesberg): Tussen-die-Riviere Wildtuin (—BD), *Roberts 5324*. 3026 (Aliwal North): Radio Springs (—DA), *Coetzee A33*. 3124 (Hanover): Lootsberg, Middelburg Dist. (—DD), *Gill 40*. 3126 (Queenstown): mountains near Fincham's Nek (—DD), *Galpin 2373*. 3222 (Beaufort West): Mountain View Farm, Nieuwveld Mts (—BD), *Gibbs Russell, Robinson, Herman & Downing 133*. 3225 (Somerset East): Bruintjies Hoogte (—CB), *without collector 29-3-21*. 3226 (Fort Beaufort): Alice, (—DD), *Giffen 691*.

*M. decumbens* has been known as 'dronkgras' since the time of Thunberg, and is suspected of being poisonous to cattle, horses and donkeys. Affected animals stagger as if intoxicated.

*Ehrharta villosa* may be confused with *M. decumbens*. The species are easily distinguished by the aristate lemma tips in *E. villosa*, and the presence of congested sterile lemmas at the end of the rachilla in *Melica*.

#### SPECIES EXCLUDED

*Melica festucoides* Licht. ex Roem & Schult. in Roem. & Schult., Syst. Veg. 2: 530 (1817) = *Pogonarthria squarrosa* (Licht.) Pilg.

*Melica festucoides* Willd. ex Steud., Nom. Bot. 2: 2 (1841) = *Pogonarthria squarrosa* (Licht.) Pilg.

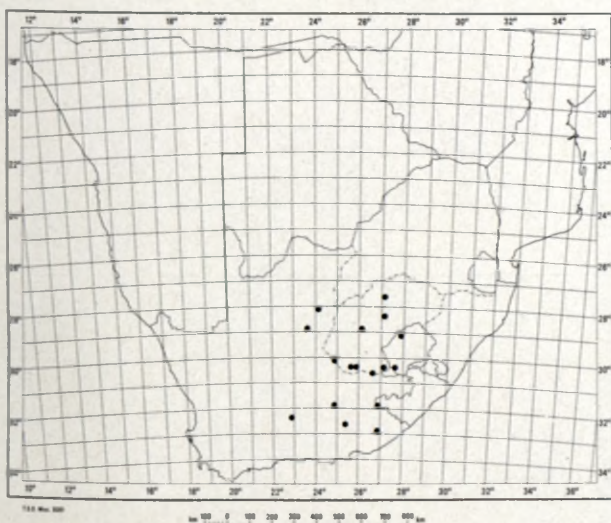


FIG. 7.—Distribution of *Melica decumbens*.

Both these names are based on the same type, a Lichtenstein specimen in the Willdenow herbarium. This specimen is clearly *Pogonarthria squarrosa*.

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Claire Smith made the drawings of the habit and spikelet structure.

#### UITTREKSEL

*Twee spesies van die genus Melica word in hierdie hersiening erken. Beide die spesies behoort tot die subgenus Melica, en hulle is die enigste verteenwoordigers van die genus in Afrika suid van die Sahara. Vyf spesies, voorheen erken, word tot sinonieme verlaag.*

#### REFERENCES

- BENTHAM, G., 1883. Gramineae. In G. Bentham & J. D. Hooker (eds), *Genera Plantarum*, Vol. 3. London: L. Reeve.
- BURR, S. & TURNER, D. M., 1933. *British economic grasses*. London: Edward Arnold.
- CHIPPINDALL, L. K. A., 1955. Guide to the identification of grasses. In D. Meredith, (ed.), *The grasses and pastures of South Africa*. Johannesburg: CNA.
- CLAYTON, W. D., 1970. Gramineae. In E. Milne-Redhead & R. M. Polhill, (eds), *Flora of Tropical East Africa*. London: Crown Agents.
- CLAYTON, W. D., 1980. List of grass genera. (unpublished).
- CLIFFORD, H. T. & WATSON, L., 1977. *Identifying grasses: data, methods and illustrations*. St Lucia: University of Queensland Press.
- DECKER, H. F., 1964. An anatomic-systematic study of the classical tribe Festuceae (Gramineae). *Am. J. Bot.* 51: 453–463.
- GOULD, F. W., 1968. *Grass systematics*. New York: McGraw-Hill.
- HATTERSLEY, P. W. & WATSON, L., 1975. Anatomical parameters for predicting photosynthetic pathways of grass leaves: the 'maximum lateral cell count' and the 'maximum cells distant count'. *Phytomorphology* 25: 325–333.
- HEMPEL, W., 1970. Taxonomische und chorologische Untersuchungen an Arten von *Melica* L. Subgen. *Melica*. *Feddes Reprium* 81: 131–145.
- HEMPEL, W., 1973. Die systematische Stellung von *Melica altissima* L. und des *Melica minuta* L. — *Melica ramosa* Vill. Komplexes (*Melica* L. subgen *Altimelica* Hempel). *Feddes Reprium* 84: 533–568.
- HITCHCOCK, A. S. & GREEN, M. L., 1929. Standard-species of Linnean genera of Phanerogamae (1753–54). *International Botanical Congress, Cambridge (England)*, 1930. *Nomencl. Prop. Brit. Bot.* pp. 110–199.
- LEHMAN, J. G. C., 1821. *Pugillus Plantarum*. Hamburg.
- LEWTON-BRAIN, L., 1904. On the anatomy of the leaves of British grasses. *Trans. Linn. Soc. Lond.* 6: 315–360.
- LINNAEUS, C., 1753. *Species Plantarum*. Stockholm.
- LINNAEUS, C., 1754. *Genera Plantarum*, 5th edn. Stockholm.
- METCALFE, C. R., 1960. *Anatomy of the Monocotyledons. I. Gramineae*. Oxford: Clarendon Press.
- NASH, G. V., 1913. Gramineae. In N. L. Britton & A. Brown, (eds), *Illustrated Flora of the Northern United States*, 2nd edn. New York: New York Botanical Garden.
- NEES AB ESENBECK, C. G., 1841. *Florae Africae Australis*. Glogow: Prausnitz.
- SCHRADER, H. A., 1821. Gottingische gelehrte Anzeigen. *Goett. Anz. Ges. Wiss.* 3: 2073.
- SMITH, B. N. & BROWN, W. V., 1973. The Kranz syndrome in the Gramineae as indicated by carbon isotopic ratios. *Am. J. Bot.* 60: 505–513.
- STAFLEU, F. A., (ed.), 1978. *International code of botanical nomenclature*. Utrecht: Bonn, Scheltema & Holkema.
- STAPP, O., 1900. Gramineae. In R. Thielton-Dyer, (ed.), *Flora Capensis*, Vol. 7. London: L. Reeve.
- STAPP, O., 1910. Diagnoses africanae XXXV. *Kew Bull.* 1910: 131.

- TATEOKA, T., 1957. A new phylogenetic system of Poaceae. *J. Jap. Bot.* 32, 9: 275-287.
- TATEOKA, T., 1965. Notes on some grasses XVIII. Affinities of the genus *Streblochaete*. *Curtis's bot. Mag.* 78: 289-293.
- THUNBERG, C. P., 1794. *Prodromus plantarum Capensium*. Uppsala: J. F. Edman.
- THUNBERG, C. P., 1823. *Flora Capensis*. Stuttgart: J. G. Cotta.
- TROUGHTON, J. H., CARD, K. A. & HENDY, C. H., 1974. Photosynthetic pathways and carbon isotope discrimination by plants, pp. 768-780. In *Carnegie Institution of Washington, Yearbook 73*. Baltimore: Lucas Printing Co.
- TZVLEV, N., 1968. Sistema Zlakov (Poaceae) Flory U.S.S.R. *Botanicheskiy Zhurnal* 53, 3: 310-312.
- WALLER, S. S. & LEWIS, J. K., 1979. Occurrence of C<sub>3</sub> and C<sub>4</sub> photosynthetic pathways in North American grasses. *J. Range Mgmt* 32: 12-38.
- WATSON, L. & JOHNSTON, C. R., 1978. Taxonomic variation in stomatal insertion among grass leaves. *Aust. J. Bot.* 26: 235-238.